MENTAL HEALTH IMPACT OF VIOLENCE

EDITED BY: Jutta Lindert, Haim Y. Knobler and Mauro Giovanni Carta
PUBLISHED IN: Frontiers in Psychiatry and Frontiers in Public Health

frontiers Research Topics

frontiers

ISSN 1664-8714
ISBN 978-2-88976-993-3
DOI 10.3389/978-2-88976-993-3

About Frontiers

Frontiers is more than just an open-access publisher of scholarly articles: it is a pioneering approach to the world of academia, radically improving the way scholarly research is managed. The grand vision of Frontiers is a world where all people have an equal opportunity to seek, share and generate knowledge. Frontiers provides immediate and permanent online open access to all its publications, but this alone is not enough to realize our grand goals.

Frontiers Journal Series

The Frontiers Journal Series is a multi-tier and interdisciplinary set of open-access, online journals, promising a paradigm shift from the current review, selection and dissemination processes in academic publishing. All Frontiers journals are driven by researchers for researchers; therefore, they constitute a service to the scholarly community. At the same time, the Frontiers Journal Series operates on a revolutionary invention, the tiered publishing system, initially addressing specific communities of scholars, and gradually climbing up to broader public understanding, thus serving the interests of the lay society, too.

Dedication to Quality

Each Frontiers article is a landmark of the highest quality, thanks to genuinely collaborative interactions between authors and review editors, who include some of the world's best academicians. Research must be certified by peers before entering a stream of knowledge that may eventually reach the public - and shape society; therefore, Frontiers only applies the most rigorous and unbiased reviews.
Frontiers revolutionizes research publishing by freely delivering the most outstanding research, evaluated with no bias from both the academic and social point of view. By applying the most advanced information technologies, Frontiers is catapulting scholarly publishing into a new generation.

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the Frontiers Journals Series: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area! Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers Editorial Office: frontiersin.org/about/contact

MENTAL HEALTH IMPACT OF VIOLENCE

Topic Editors:
Jutta Lindert, University of Applied Sciences Emden Leer, Germany
Haim Y. Knobler, Hebrew University of Jerusalem, Israel
Mauro Giovanni Carta, Università di Cagliari, Italy

Citation: Lindert, J., Knobler, H. Y., Carta, M. G., eds. (2022). Mental Health Impact of Violence. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88976-993-3

Table of Contents

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 28 October 2020
doi: 10.3389/fpsyt.2020.581031

Assessing the Acceptability, Feasibility and Sustainability of an Intervention to Increase Detection of Domestic Violence and Abuse in Patients Suffering From Severe Mental Illness: A Qualitative Study

Roos E. Ruijne[1], Astrid M. Kamperman[1], Kylee Trevillion[2], Carlo Garofalo[3,4], Mark van der Gaag[5,6], Milan Zarchev[1], Stefan Bogaerts[3,4], Louise M. Howard[2] and Cornelis L. Mulder[1,7]*

[1] Department of Psychiatry, Epidemiological and Social Psychiatric Research Institute, Erasmus University Medical Centre Rotterdam, Rotterdam, Netherlands, [2] Section of Women's Mental Health, King's College London, Institute of Psychiatry, Psychology and Neuroscience, London, United Kingdom, [3] Department of Developmental Psychology, School of Social and Behavioral Sciences, Tilburg University, Tilburg, Netherlands, [4] Fivoor Science and Treatment Innovation, Poortugaal, Netherlands, [5] Parnassia Academy of the Parnassia Psychiatric Institute, The Hague, Netherlands, [6] Department of Clinical Psychology and Amsterdam Public Mental Health Research Institute, VU University, Amsterdam, Netherlands, [7] Antes, Department of the Parnassia Psychiatric Institute, Rotterdam, Netherlands

OPEN ACCESS

Edited by:
Haim Y. Knobler, Hebrew University of Jerusalem, Israel

Reviewed by:
Silvia Krumm, Ulm University Medical Center, Germany
Moshe Z. Abramowitz, Peres Academic Center, Israel

***Correspondence:**
Roos E. Ruijne
r.ruijne@erasmusmc.nl

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *07 July 2020*
Accepted: *25 September 2020*
Published: *28 October 2020*

Citation:
Ruijne RE, Kamperman AM, Trevillion K, Garofalo C, van der Gaag M, Zarchev M, Bogaerts S, Howard LM and Mulder CL (2020) Assessing the Acceptability, Feasibility and Sustainability of an Intervention to Increase Detection of Domestic Violence and Abuse in Patients Suffering From Severe Mental Illness: A Qualitative Study. Front. Psychiatry 11:581031. doi: 10.3389/fpsyt.2020.581031

Rationale: Despite interventions to improve detection rates, domestic violence, and abuse (DVA) remains largely undetected by healthcare services. We therefore aimed to examine the acceptability, feasibility, and sustainability of an intervention aiming to improve DVA detection rates, which included a clear referral pathway (i.e., the BRAVE intervention) and to explore the acceptability and feasibility of DVA management and referrals in general, in the context of low detection rates.

Methods: Qualitative study design with four focus groups of 16 community mental health (CMH) clinicians from both control and intervention arms. The focus groups discussed managing DVA in clinical practice and staff experiences with the BRAVE intervention in particular. Focus groups continued until saturation of the subject was reached. Interviews were analyzed using a thematic analysis approach.

Results: DVA was seen to be highly relevant to mental healthcare but is also a very sensitive subject. Barriers in CMH professionals, institutions, and society meant CMH professionals often refrained from asking about DVA in patients. Barriers included communication difficulties between CMH professionals and DVA professionals, a fear of disrupting the therapeutic alliance with the patient, and a lack of appropriate services to help victims of DVA.

Conclusion: The BRAVE intervention was acceptable but not feasible or sustainable. Personal, institutional, and public barriers make it not feasible for CMH professionals to detect DVA in mental healthcare. To increase the detection of DVA, professional

standards should be combined with training, feedback sessions with peers and DVA counselors, and routine enquiry about DVA.

Clinical Trial Registration: ISRCTN, trial registration number: ISRCTN14115257.

Keywords: domestic violence and abuse (DVA), psychiatric patients, education, public mental health care, qualitative study, community mental health agencies, outpatient care

INTRODUCTION

Domestic violence and abuse (DVA) are important societal problems with negative consequences for individuals and for society. DVA is defined as "any incident of threatening behavior, violence or abuse (psychological, physical, sexual, financial, or emotional) between adults who are or who have been an intimate partner, friend, family member or otherwise closely related person (e.g., caregiver or roommate)" (1). Although prevalence is high across all layers of society, certain groups—such as severely mentally ill (SMI) patients—are more vulnerable to being victims of DVA (2, 3). In this article we define severe mental illness as any mental disorder resulting in serious functional impairment, which causes significant limitations in daily activities (4). DVA victimization can have serious short and long-term health mental and physical consequences (5–7) and has a prevalence of around 20% in SMI patients (8). Compared to the general population, SMI patients are also more often a perpetrator of DVA (2% in the general population vs. 7 to 8% in persons with SMI) (9, 10). However, SMI patients are still more often a victim of DVA than a perpetrator of DVA (11). In this article we therefore focus on victims of DVA. Despite this high prevalence of DVA and the risk of serious consequences, mental healthcare professionals detect only a fraction of cases (12). Many of the barriers to inquiring about DVA and to detect DVA in psychiatric patients are related to professional shortcomings such as a lack of knowledge and confidence in the interview skills needed (13). A cluster randomized controlled trial (RCT) called the IRIS (Identification and Referral to Improve Safety) study (14) including a training sessions, a prompt in the medical record to ask about abuse, and the establishment of a referral pathway-reported that primary care providers' shortfalls in DVA knowledge and skills can be successfully addressed using a training program. This intervention increased DVA detection rates and number of referrals to DVA services. Promising effects were also demonstrated by the subsequent adaptation of this training for mental healthcare providers (Linking Abuse and Recovery through Advocacy, LARA (15), which formed the basis in the Netherlands for a cluster randomized controlled trial (RCT) called BRAVE (Better Reduction trough Assessment of Violence and Evaluation) (16). The BRAVE training comprised of three elements: training for mental health care professionals on DVA; training on mental health for DVA professionals, and the provision and establishment of a referral pathway between community mental health (CMH) services and DVA services for SMI patients who were victims of DVA. Although the results of the RCT showed that the intervention was followed by a significant improvement in DVA knowledge and management skills, and by a change in attitudes toward DVA among mental healthcare professionals, the number of DVA cases detected did not increase (Ruijne et al., in review, Journal of Interpersonal Violence). The purpose of this parallel qualitative study was to (1) explore the acceptability, feasibility and long-term sustainability of the BRAVE intervention and (2) to explore the acceptability and feasibility of DVA management and referrals in general, with a focus on: knowledge about DVA, assessment of DVA, safety, and treatment/follow-up. The intervention we used in our cluster randomized controlled trial was new and has not been used in research before. During the intervention period we used quantitative methods to assess the intervention (data not reported here). However, we also wanted to gain more in-depth knowledge on the motives and behavior of CMH professionals on their decision to discuss DVA or not discuss DVA. For this purpose, we deemed a qualitative approach to be the best suited method. We hypothesize that perhaps it is not feasible or acceptable to discuss DVA with patients for reasons unknown for us. With the assessment of the "feasibility" and "acceptability" in both control CMH professionals as professionals working in intervention teams, we wanted to assess whether it is feasible and/or acceptable to discuss DVA patients and what the underlying reasons could be tot not assess DVA, irrespective of the intervention. To gain more variety in the gained information from interviews, we decided to interview members from control teams as well as intervention teams.

METHODS

Design

Four focus groups were conducted with CMH professionals working in teams participating in the BRAVE study. During the 12 month follow-up period of the trial, we also used researchers' field notes to collect context information. Reporting of this article follows the COREQ (Consolidated criteria for reporting qualitative research) guidelines (17).

Study Setting

The BRAVE study consists of a qualitative component and a quantitative component. The quantitative component is a cluster RCT, which aimed to improve the detection and referral rates of SMI patients who are a victim of DVA using the BRAVE-intervention (ISRCTN 14115257). The intervention used in the BRAVE study consisted of three parts; (1) training in DVA knowledge and skills for mental health professionals in community mental health (CMH) teams, (2) training in mental illness and mental healthcare services for DVA professionals, and (3) the provision and establishment of a direct-care referral

pathway between CMH services and DVA services for victims of DVA with SMI. To increase referral rates of patients who are victims of DVA we also aimed to: (1) provide quick access to DVA services, and (2) manage the expectations of CMH professionals and DVA professionals by providing information about the possibilities and limitations in helping DVA victims for both mental healthcare providers and DVA services. Unfortunately, due to reorganizations within the DVA services during the study period, we were unable to provide a training to manage expectations on mental health care for all DVA professionals. The trial was conducted in an urban area of the Netherlands in two municipalities: The Hague and Rotterdam. Mental healthcare in both municipalities is provided by two CMH institutions, namely BAVO Europoort (Rotterdam) and Parnassia (The Hague). Both institutions provide outpatient and inpatient mental healthcare and cover the Rotterdam-Rijnmond and The Hague regions which in total have $\sim$ 2.5 million inhabitants.

The trial included 24 CMH teams that generally consist of around 10 professionals: psychiatric nurses, psychologists, psychiatrists and social workers. The majority of these teams consist of general nurses and/or psychiatric nurses. Twelve teams were randomized to the intervention condition and twelve to the control condition. The CMH teams in the intervention condition received a training of about 8 h, details regarding the intervention can be found in the protocol paper (16) and the quantitative paper of the BRAVE RCT (*Ruijne et al., in review, Journal of Interpersonal Violence*). The CMH teams in the control condition provided care as usual. The BRAVE intervention used a naturalistic approach and consisted of more elements than a training. The BRAVE intervention offered tools (i.e., conversation techniques, safety checklist, and memory aids) in helping to assess and manage DVA and participants were encouraged to use these tools throughout the intervention period. However, apart from the Meldcode protocol, the intervention did not consist of a mandatory, predefined method to assess and refer victims of DVA. Ethical approval for the BRAVE trial (both the trial and the qualitative study) was obtained from the Medical Ethical Committee at Erasmus University Medical Center, (MEC-2015-409) on June 10th, 2015. The quantitative results from the BRAVE RCT are described in detail elsewhere (Ruijne et al., submitted).

Context of DVA Services

Municipalities in the Netherlands have their own DVA services, each offering various types of care, ranging from shelters to empowerment courses. However, as part of a nationwide program of municipal reorganizations in 2015, an umbrella organization called Veilig Thuis (i.e., "Safe at Home") was founded. Veilig Thuis is intended to be an organization that professionals can consult for advice, or where they can report DVA or child abuse. Reporting a case is mandatory only when there is immediate or recurring danger. Veilig Thuis must investigate the individual case and refer the victim to the appropriate DVA service. Although Veilig Thuis does not take victims into their care, it does function as a gatekeeper and case manager for individual cases. Veilig Thuis is embedded in the so-called Meldcode protocol, a guideline for referring victims of DVA (18), the Meldcode is solely used by other institutes than Veilig Thuis. The Meldcode consists of five steps: (1) assessment of DVA signs, (2) consultation with a direct colleague or Veilig Thuis, (3) discuss DVA with the victim, (4) consider all available information gathered in the first three steps, decide if the patient is a victim of DVA and assess the safety of the situation, and (5) in this final step, the healthcare professional has to make two decisions, namely: should the case be reported to Veilig Thuis; and/or could suitable care be provided within their own organization. Following the steps of the Meldcode protocol is mandatory, but reporting DVA cases to Veilig Thuis is not. The BRAVE study was conducted at the same time as the nationwide reorganization of the municipalities and the introduction of Veilig Thuis. Due to this reorganization, however, Veilig Thuis was not fully functional at the start of the BRAVE study, and could not offer all previously announced services.

Participants

All CMH professionals involved in the BRAVE study were eligible for inclusion in the four focus groups. They were actively recruited through e-mail, newsletters, and during team visits. After the intervention period, we sent bi-weekly invitations to all representatives of the participating CMH teams until we achieved a minimum of three and a maximum of five participants per focus group. To ensure maximum information density and saturation, two focus groups consisted of CMH professionals employed by mental health institutions situated in the Rotterdam Rijnmond region and two focus groups consisted of CMH professionals employed by the mental health institution situated in region of The Hague. Together, these mental health institutions are the largest conurbation in the western Netherlands. One of these groups consisted entirely of CMH professionals who received the BRAVE intervention (*Ruijne et al., in review, Journal of Interpersonal Violence*), and the other of CMH professionals in the control condition. The other two focus groups comprised a mix of participants from the intervention and control conditions. We also used mixed focus groups to be able to benefit from the discussion between participants of the participants of the intervention teams and the control teams. With using mixed focus groups, we expected a wider scope of views on the subject of DVA and different types of information as compared to when we would have had homogeneous focus groups. To compose the focus groups, we used convenience sampling. All participants provided written informed consent in advance and could withdraw from the study at any time. The protocol and addendum were approved by the Medical Ethical Committee of the Erasmus Medical Center (MEC 2015-409). All participants received an information letter regarding the process of the study beforehand and signed a consent form. This study was conducted in accordance with the Declaration of Helsinki (1964), as amended in Edinburgh (2000).

Procedures

Focus-Group Discussions

The BRAVE intervention started February 2016 and ended in February 2018. Each of the four focus groups were held at different locations after the end of the intervention: in October

2017 for the Rotterdam Rijnmond site and in October 2018 for the The Hague site. Each was held in a neutral meeting room at the participating institutions. Two weeks in advance, participants received an information letter including the purpose of the interview. To ensure attendance, a reminder was sent 1 week later. Each focus group lasted ∼ 3 h, including a half-hour break. The discussions were led by two researchers: RR, who acted as a moderator, and a research assistant, who monitored the process and intervened if necessary, such as when probing for details or to ensuring that all predefined themes had been discussed. The moderator was not part of the BRAVE intervention itself, but did help develop the BRAVE training. Two independent trainers provided the training to the teams. The moderator was assisted by an independent research assistant. The transcripts were analyzed by the research assistant and the moderator. The interrater reliability was secured with the help of AK. Additionally, the focus groups were both conducted before the results of the RCT of the BRAVE intervention were known, minimizing the potential bias of the moderator. Each group started by introducing all participants, followed by an informal question to introduce the main theme (DVA). The subsequent questions followed a semi-structured approach and were related to themes defined a priori: the acceptability, feasibility and sustainability of the BRAVE intervention (intervention teams) or DVA management in general (control teams), knowledge about DVA, assessment of DVA, safety, and treatment/follow-up of DVA). After each focus group session, all initial thoughts and ideas the researchers conducting the focus group session had were documented. From these notes themes arised, they were added to the topic list and included in the subsequent focus groups. The discussions were audio recorded and transcribed verbatim.

Context Information

We recorded information on participants' overall experiences with referral sites, the intervention and cases of DVA during the study period. This contextual information, which gave us more detailed insight into daily work routines, was collected during training days, after interviews, and during site visits of all included teams. It was used to formulate questions and core themes to use during the focus groups.

Data Analysis

The data was analyzed using a thematic analysis approach, a flexible, analytic method that is widely used in qualitative health services research (19, 20). The analysis consisted of four steps; First, the transcripts were coded for the predetermined themes: acceptability, feasibility and sustainability of the BRAVE intervention and the feasibility of the management and referral of DVA for both intervention and control teams, while also making notes and use open coding for possible themes not directly related to the subject. A researcher trained in qualitative research (RR) conducted the initial coding. Second, after initial coding of the predetermined themes, we used open coding to find more specific information and to find emerging themes, subthemes, or patterns that were not driven by the initial research questions, but still relevant to the interpretation of the study results. Third, we applied structure and hierarchy to distinguish between general themes and detailed sub-themes. Fourth, all codes were reviewed and aggregated according to the themes deemed appropriate and subsequently labeled accordingly. Interrater–reliability was assessed on a theme level per 5-line block of the transcript. In total, 15% of the full transcripts was coded by RR and AK independently. For the purpose of calculating Interrater reliability we used the information on whether the text coded for a theme and which theme (acceptability, feasibility or sustainability). The Kappa level was 0.85 with a 95% confidence interval of 0.81–0.88. Nvivo 11 software (21) was used to code and analyze the data. When reporting the results, quotes from respondents are used to illustrate the results.

RESULTS

Characteristics of the Participants

In total, 16 mental healthcare professionals participated in the focus groups, which comprised between three and five participants, of whom 63.5 % (10/16) were female and 37.5% (6/16) of whom had received the BRAVE intervention. The groups consisted of five social psychiatric nurses, three general nurses, four social workers, three psychologists, and one psychiatrist. Participants' age varied from 25 to 56 years ($M = 41$;$SD = 10.0$). Years of experience working in mental healthcare ranged from 1 to 27 ($M = 11$; $SD = 7.3$). All results are derived from the transcripts of the focus group discussions.

Key Themes

Supplementary Table 1 shows the key themes that were identified prior to the start of the focus groups and the themes derived from the focus groups discussions. The table is divided into two halves: the upper half contains all key themes and sub themes from participants from intervention teams related to the BRAVE intervention and the lower half contains all themes from participants from both intervention teams as well as control teams.

Mental Healthcare Professionals Working in Intervention Teams

Acceptability of the BRAVE Intervention

Participants in the BRAVE intervention were asked to reflect on the intervention's training sessions, which they evaluated positively, referring to most mentioned beneficial elements were: (1) the training had provided sufficient time for practice and interaction; (2) because the training content was pragmatic in nature, knowledge and skills could be implemented immediately in clinical practice; (3) participants preferred physical attendance to e-learning modules; (4) the trainer had good understanding of the participants' work- and expertise with regard to DVA.

However, participants in the BRAVE training would have liked more information on the practical aspects of healthcare professional -patient confidentiality, patient autonomy and duty of care, and how to balance them.

"I now think I'd like to have heard more about healthcare professional-patient confidentiality and your duty to provide proper care. The training covered it a bit, but there should

have been more about it." [Intervention team, male, nurse (on the training)]

Participants said that they wanted more practice with what they could and could not do within the legal framework of healthcare professional–patient confidentiality. Even though the training did cover this, participants felt that in practice, they often do not feel confident enough in their knowledge. One participant said he wanted another course that specifically dealt with this topic.

When asked to describe the characteristics of an ideal trainer, participants indicated that he or she should be able to impress, motivate and enthuse you. A participant from a control team who attended a mixed focus group said that personal stories, such as DVA experiences told by DVA survivors had helped to become sensitive to DVA experiences. Participants from intervention teams, who also heard personal stories during the training, agreed with her statement.

"Hearing about the victims' experiences helped me a lot. During the training on DVA, one of the victims told the story of the abuse she'd endured from her mother. That had a real impact on me—it made me more alert, and it made me think." [Control team, female, social worker]

Feasibility of the BRAVE Intervention

All participants who had received the BRAVE intervention found it to be feasible, they also used the learned skills and knowledge on DVA in their daily routine. The BRAVE intervention provided tools to assess and manage cases of DVA. It was not mandatory to use these tools. We did not set any targets and the offered tools could be used as the CMH professional deems necessary. Therefore, barriers and dilemmas regarding feasibility on the detection of DVA are comparable to those in the control group.

Sustainability of the BRAVE Intervention

According to the participants, a one-off training was not enough to ensure a full and effective implementation of the gained skills and knowledge about DVA in their daily routine. Almost all of the participants reported that the focus on DVA in the team in which they worked had been high in the first 2 to 3 months after the start of the BRAVE intervention. During the year of follow-up, however, their focus and knowledge steadily decreased. Some participants had implemented a routine question on DVA in their team meetings, which allowed them to remain focused on DVA in their patients. But most had not introduced such a structural inquiry, and their focus on DVA had dissipated. A comparison was made with their license to administer intramuscular injections: to prove their competence and have their license renewed, participants had to repeat the course in question. To maintain the effectiveness of a particular training, it should thus be repeated at least once a year and it should be obligatory. Participants also needed a recurrent stimulus to keep asking about DVA in their patients. While time-consuming surveys or forms were not desirable, short screening questions asked during intake, or a pop-up in the electronic patient file were found to be suitable ways of ensuring long-term sustainability. One participant preferred to make one person per team responsible for screening DVA in all patients. While most respondents agreed, some respondents also mentioned that screening for DVA is also a shared responsibility and that a whole team should be able to do so. Adding one person who is responsible to remind their peers to screen was a better option in their opinion. To maintain sustainability, it was also important for the team as a whole to have a positive attitude toward DVA screening, and for all members of the team to feel confident that their fellow team members did indeed screen for DVA within their caseloads. These elements were mentioned by participants who did not receive the BRAVE intervention as well.

Mental Health Care Professionals Working in Intervention Teams or Control Teams

Acceptability and Feasibility of the Management and Referral of DVA

All participants saw DVA as an important and relevant topic. All participants also agreed that asking about DVA should be part of routine care and it is part of being a mental health professional to ask about it. However, many of them thought it was difficult to screen their patients for DVA and to manage the cases they detected. This mainly reflected a combination of practical and personal emotional barriers, dilemmas in the detection and referral of victims of DVA, and barriers in communication between DVA services and CMH services.

Barriers in the Detection of DVA

On a practical level, there appeared to be procedural obstacles. For instance, the questions asked to patients during the extensive intake for admission to a CMH team, are strictly protocolled. However, as this intake protocol does not cover DVA, professionals often forget to enquire about it. Participants suggested that this barrier could be resolved simply by adding DVA to the mandatory questions. Some participants said that they did not consider DVA a priority and that there mostly are more pressing issues demanding their attention. Adding a question about DVA to the protocolled questions would normalize talking about DVA—which could be helpful in further contact with the patient—and it could help and prioritize asking about DVA. If patients knew that these questions were part of standard procedures, they would not be considered intrusive or offensive.

Emotional barriers

On an emotional level, other participants reported that they could not find an opportune moment to discuss DVA. Doing so during the intake was considered premature and intrusive; building a therapeutic relationship was seen as a prerequisite to discuss DVA. However, not all participants agreed with this. Asking questions about sensitive topics is also part of being a professional in mental healthcare. Some participants argued, that during intakes, professionals asked many questions that are both sensitive and pragmatic. However, during routine care there is no standard format of questions. Uncertainty and not knowing what to do if a patient discloses being a victim of DVA play a major role in being apprehensive to ask about DVA.

"But our routines don't have a fixed format. The question is also what our role is in all of this, because if you ask about DVA and find out that it's taking place, you also want to be able to do something about it. You want to have a response to it. So, I take this into consideration as well." [Control team, male, nurse]

Additionally, five participants from the control teams and one participant from the intervention teams who did not detect any signs of DVA during conversations with their patient, concluded that it was unnecessary to ask about it. Despite the emphasis given in the BRAVE intervention on active enquiry irrespective of physical signs of DVA, the same explanation was also provided by one participant who had taken the training. It was also the case that professionals usually opted to not discuss DVA, if the alleged perpetrator of violence was present when DVA was discussed with the patient, as this is deemed not to be safe either for the patient or the mental health professional.

Safety

Safety was also a possible issue when discussing DVA with patients, during home visits. All participants worked in CMH teams and made home visits, usually in pairs. To ensure their safety, they did not ask about DVA whenever they were not accompanied by a colleague. Potentially, the barriers described above could lead to delays and to not discussing DVA at all.

Participants were also hesitant to talk about DVA because they considered it taboo, much like talking about sexuality. With regard to being able to ask about a sensitive subject such as DVA, almost all participants said that mutual trust was necessary. In CMH care, mutual trust is not a given (22). It is often difficult for CMH professionals to engage patients who have little or no insight into their illness and their need for mental healthcare (23). As a result, participants reported their worries that discussing DVA might cause the patient to disengage and avoid future care.

"*You use the strength of the therapeutic alliance to assess whether or not you can discuss DVA. Sometimes this assessment tells you that if you discuss DVA now, you'll lose contact, and thus your grip on the whole situation."* [Control team, male, nurse]

"If they [patient] close the door on you, it's game over. There's nothing you can do anymore." [Control team, male, nurse]

However, when questioned about the actual consequences of discussing DVA with their patient, most participants reported that most of their patients had responded in a neutral manner, and contact remained unaffected. But some patients took offense, refused further healthcare, or asked to be transferred to a different CMH professional. This was especially prevalent in cases that also involved children.

Dilemmas in the Detection and Management of DVA

Finding a balance between these responsibilities often caused the participants moral and ethical dilemmas. For example, one participant referred to a female patient who prostituted herself in the sheltered housing where she lived. She was often raped by housemates and her customers, which negatively affected her mental and physical health. However, she refused to report these crimes to the police. On the one hand the participants wanted to protect their patient and keep her out of harm's way, that is, by reporting the sexual assault to the police without the patient's consent. On the other hand, they also wanted to respect her autonomy. The balance between protecting a patient and respecting their autonomy can be difficult. To be better able to handle the conflicting responsibilities and cope with the emotional burden, CMH professionals expressed the need for peer-to-peer consultation or a DVA consultant, which is not standard practice in mental healthcare institutions.

"You just want to say that it affected you emotionally. But I know that if I said that in my team meeting, they'd just continue as if they hadn't heard. Nobody would ask how I felt." [Control team, female, social worker]

Patients refusing offered DVA services

Sometimes it so happened that participants detected DVA but the patient wanted no help for it. If the violence is not directly life-threatening—and all those involved were adults—victims of DVA cannot be mandated to accept help.

"This happened in a case of mine—a patient who was being stalked and abused by her ex-partner in front of her –adult-children. Ideally, I'd have got them help right away, but the children didn't want help, the patient didn't want help… Which meant there was nothing I could do." [Control team, female, psychologist]

There is one exception to this rule, however. The presence of under aged children in a family gives the CMH professional a mandate to intervene to protect them from imminent harm, for example by requiring the DVA victims to accept or adhere to treatment, or otherwise to surrender their legal right to care for their children, or otherwise to surrender their legal right to care for their children.

"Down the years Veilig Thuis wasn't involved, and nobody did anything about the children. But now they **are** *involved, the penny dropped: my patient finally realized that she was about to lose her children and everything else."* [Control team, female, social worker]

The patient as a perpetrator of DVA

Other dilemmas arose when the patient was the perpetrator and his or her partner was the victim. The training emphasized that discussing DVA with a potential perpetrator in the presence of the victim could lead to more violence or could prevent a victim to disclose DVA (10, 13, 21, 24). This means that where the patient is a perpetrator, the partner should be seen separately. This is not always possible due to healthcare professional-patient confidentiality; consent from the patient is required before any healthcare worker may discuss DVA separately with a partner. This consent is only needed if there is no risk of serious harm to the partner and/or if there are no underage children involved. A participant working in a control team dealt with this dilemma and tried to discuss DVA with the patient and partner simultaneously. However, research shows

that discussing DVA with both a potential victim and perpetrator can be dangerous and therefore should be avoided at all times (21, 24).

> *"I talked about DVA when [the perpetrator's/patient's] girlfriend was present. I asked if something had happened lately. She said no. But it's hard not to notice that he [the perpetrator/patient] is still in the room. He's a big guy. I think it's useful to discuss DVA, but under such circumstances, I'm not sure you'll get a truthful answer."* [Control team Male nurse]

Usually, at the start of interviews with family, CMH professionals report that everything family says will be documented. However, partners sometimes told the CMH professional -before they could mention this disclaimer- that they were the victim of DVA and the patient the perpetrator, but urged the professional not to talk to the patient about it. This led to a dilemma, as all information regarding the patient has to be documented. In addition, all patients have the right to read all the information in their files. If the CMH professional would like to respond to the information provided and refer their patient -and perpetrator- for help, they would have to explain why they are referring. If the patient then asks who provided them with this information, the CMH professional has to share this with the patient. This was mentioned by the participants as dilemma, since this can be potentially dangerous for the partner.

> "*…Or the partner is the victim and calls to say that DVA has taken place, but you mustn't talk to him about it. We do discuss this in the team. However, if you're the person treating the alleged perpetrator and the partner tells you to stay silent, you're stuck."* [Control team, male, nurse]

Participants therefore felt that their abilities to provide the care they would want to provide were limited by their mandate and the rules on healthcare professional-patient confidentiality. As a result, CMH professionals could not always prevent the negative consequences of DVA.

Barriers to Managing and Referring Victims of DVA

In the focus in communication between CMH services and Veilig Thuis. As mentioned above, CMH professionals have to groups it became clear that participants experienced difficulties adhere to a professional code of conduct, part of which involves healthcare professional -patient confidentiality. By referring a patient against his or her will, they will breach that code and this requires a sufficiently good reason. It is often difficult to know when and how it is permissible to breach this confidentiality code. Participants expressed the need for an expert who can help with such legal questions. Although Veilig Thuis often requests medical information about a patient, healthcare professional -patient confidentiality means that it cannot always be given freely. Five participants remarked that those at Veilig Thuis were not always conversant with the rules and regulations governing the exchange of medical information. This perpetuated the communication difficulties and a discrepancy in expectations between Veilig Thuis and CMH professionals.

Barriers in Communication Between Mental Health Services and DVA Services

Even though Veilig Thuis assigned a case manager after a case of DVA was reported, participants criticized the manner in which this was interpreted and how they managed and provided care for their patients.

> "*: My experience is that if Veilig Thuis gets involved, I end up on the sidelines—that they tend to take over my patient."* [Control team, female, social worker]

As well as indicating the need for someone to coordinate all care and communications between all parties the involved, participants also said that if they reported a victim of DVA to Veilig Thuis, they were often not informed about the other parties and therapies to which the victim was then referred.

This could mean either that therapies were started that could negatively influence the patient's mental health, or that the parties involved all assume that another party is focusing on DVA.

> *"Yes—whoever's responsible or in charge, there are so many players with so many different specialisms. Yes, we all want the same, but I regularly still see it going wrong. And that's sad."* [Intervention team, female, nurse]

Dilemmas in diffusion of responsibility

Sometimes the outcome of these assumptions is that nobody does anything. Participants said they had to cross quite a high threshold before requesting help for a victim of DVA. Once they had reached that threshold, they expected the DVA services to view their case as urgently as they viewed it themselves.

> *"I also expect DVA professionals to impose more. Once we had a woman in care with a husband and a baby who said a few times that she was being abused. We saw the signs, but each time it was just too little to prove the abuse. While there was also a baby … But, no, she [patient] didn't want us to treat her."* [Control team, female, nurse]

As this was often not the case, however, frustration could follow, although some participants added that they knew their expectations were not always in line with reality.

> *"If I speak for myself with regard to Veilig Thuis, whenever I report a case, basically I hope that the problem will now be resolved. But you know that it's not realistic."* [Control team, female, psychiatrist]

Practical dilemmas

However, if a patient does accept help, and the situation requires the patient to move to a safe house, it is often difficult to find a place where the patient can go to. The places in shelters and safe houses are scarce and fully occupied most of the time.

When a CMH professional detects DVA, most want to intervene and stop the violence immediately. However, any combination of a patient's unwillingness to accept help, the CMH professional's and DVA services' limited mandate, and a shortage of places in safe houses leaves a CMH professional with few options to intervene.

DISCUSSION

Main Findings

In this qualitative study, we explored whether it was both acceptable and feasible to provide an intervention aimed at increasing the detection of Domestic Violence and Abuse (DVA), whether the effect of such an intervention could be sustained, and how mental healthcare professionals managed with DVA in daily practice. This study was conducted in the context of a cluster randomized controlled trial. The trial did not demonstrate an effect of the training on DVA detection rate (*Ruijne et al., under review in journal of Interpersonal Violence*).

Despite the fact that all participants who participated in the focus groups found the intervention highly acceptable, topic relevant and important, participants had trouble maintaining the knowledge and skills they had acquired during the DVA training. This indicates that the effects of the intervention were not sustainable. The main reason for this was that their focus on DVA declined in the first few months after the training. This is consistent with previous literature. Allen et al. (25) and Trevillion et al. (3), found that to get professionals in healthcare to talk about DVA, it was important to design and implement standardized routine inquiries. Participants agreed with these findings, and said that asking about DVA should be part of their own standard, routine enquiry. They also stressed that a training such as BRAVE should be repeated once a year.

The intervention required CMH professionals to ask their patients about DVA on a regular basis. This proved to not be feasible for participants. Both participants from the intervention teams as well as participants from the control teams provided possible explanations for this. The first possible explanation participants provided for not asking about DVA was a fear of disrupting the therapeutic alliance and a fear of symptoms increasing in patients by asking about DVA, especially if there are underage children involved. Participants found it difficult to know when and where to ask, regardless of receiving the intervention or not. The participants struggled with their need to protect victims from continued abuse and violence, which might involve breach of healthcare professional -patient confidentiality in the case of adult victims vs. patient autonomy. Parallels could be drawn with asking about trauma in Dutch SMI patients. For a long time Dutch professionals did not ask about trauma because this was taken to mean that the patient will show more symptoms, which in turn could lead to more medication or even hospitalization (26). However, the opposite view is now accepted. Patients who are asked about and treated for trauma show a significant decrease in symptoms compared to patients who have not been treated (27, 28). In the article by Trevillion et al. (29) professionals also expressed their fear of offending a patient when they asked about DVA. In the same article, however, service users said they wanted professionals to talk about DVA, as they believed it would encourage disclosure. Similar results were found by Feder et al. (30). They found that it was important to service users that professionals not only adopted a supportive and non-judgmental attitude toward DVA, but also that they provided ongoing support. It is important for professionals not to hold back on enquiry until they feel the time is right. Withholding could play upon a victim's anxieties about the stigma and shame of the abuse, while routine enquiry could instead help relieve them. Additionally, asking about DVA would also show that the professional understands how common DVA is and can help if a victim chooses to disclose, which is in accordance to the NICE (National Institute for Health and Care Excellence) guidelines (31). Since managing DVA in patients can also be emotionally challenging for CMH professionals, mental health institutions should provide peer-to-peer support for CMH professionals.

A second explanation could be the safety of DVA victim and CMH professionals. If the patient is a perpetrator, this adds complexity to DVA management. Less research has been done about patients being perpetrators and the best course of action in standard mental healthcare. However, this theme consistently emerged during the focus group discussions and caused many dilemmas in daily practice (32). While talking about DVA in the presence of a possible perpetrator can sometimes lead to dangerous situations for the victim (13, 24, 33), participants indicated that it was not always possible to talk to a possible victim of DVA in private, especially when the patient was a perpetrator and their partner a victim. Because DVA was a taboo topic for some participants, they did not feel comfortable discussing it with patients if they were alone in the patient's home. This feeling stemmed mainly from previous experiences of aggression, from not feeling skilled enough to discuss it, or from lacking the ability to discuss it.

A third explanation could be the participants' lack of mandate to intervene, accompanied by the frustration they often felt when they had to manage DVA in their patients. If adult DVA victims want to receive help, they have to be willing to accept it. Unfortunately, this doesn't take into account the nature of coercive controlling DVA and the fear many patients have that violence will escalate if they leave—as indeed it can, evidenced by the fact that DVA homicide is more likely at the point of or after leaving a DVA perpetrator. Participants mentioned that they can press charges for a patient, or for the partner of that patient, only if they feel that his or her life is in danger and if they feel able to prove the victimization. As professionals cannot force a patient to press charges or to accept help for DVA, moral dilemmas, frustration and a feeling of defeat can follow—and this may, unconsciously or otherwise, lead some professionals not to ask about DVA at all.

Limitations

Due to the reorganization and introduction of Veilig Thuis at the start of the BRAVE study, Veilig Thuis was unable to work closely with CMH professionals. As a consequence, we found that the cooperation between DVA services and mental health services needs to be improved. Participants feared that the lack of communication and coordination in the management of DVA cases would ultimately lead to substandard care, which might lead in turn to more severe physical and mental consequences, and/or aggravation of the violence to which a patient was exposed. It was also clear that it was important to provide access to a DVA expert for questions and help in management of DVA, and more attention should be paid to the emotional well-being of the mental health professionals who dealt with cases with DVA.

This study was conducted during a nationwide reorganization of DVA services. Institutional reorganizations are very common in the healthcare and social sector, making it difficult to provide a consistent approach in providing care, and impacted on our intervention not being long-lasting. Although our sampling continued until the data was saturated, it should be noted that a majority of our sample consisted of nurses. While, in theory, psychiatrists or psychologists may have given different views on the problem of DVA in psychiatric patients, this was not the case in this sample, which was representative of the general composition of an average CMH team (34), suggesting a generalizability of the results.

CONCLUSION AND CLINICAL IMPLICATIONS

In recent years, DVA has gained more attention in the domain of clinical work. Its detection nonetheless remains low, and few interventions have attempted to increase it. Our findings highlight the importance of a multidimensional intervention that focuses not only on CMH professionals but also on institutional inputs such as setting up peer-to-peer support for CMH professionals, and using prompts in patient files to remind professionals to ask about DVA. When training is part of an intervention, it should be inspirational and informative. Importantly, it should also be recurrent. It is equally important to focus on how to ensure successful implementation, a matter that requires a good understanding of the local contexts in which the services operate, ensuring the proper functioning of DVA referral sites, and ensuring extensive communication and collaboration between CMH institutions and DVA services. An important starting point could be to actively facilitate enquiries about DVA and making them part of the routine clinical enquiry. Finally, as it is also important not to underestimate the possible impact on the CMH professional of working with victims of DVA, these professionals should be given space to express their concerns and discuss cases within the organizations where they work.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author, RR. The data are not publicly available due to their containing information that could compromise the privacy of the research participants.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Medical Ethical Committee at the Erasmus University Medical Center, MEC-2015-409. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

RR prepared the topic list, included the participants, collected the data, and analyzed the data and prepared the manuscript. AK prepared the topic list, and analyzed the data and prepared the manuscript. KT provided feedback on the topic list and on the manuscript. CG, MG, MZ, SB, LH, and CM all provided feedback on the manuscript throughout the whole process of preparing the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

This project received a grant from the Netherlands Scientific Organization: Grant number: 432-13-803. The funder of this study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

ACKNOWLEDGMENTS

The authors would like to thank all who contributed to this paper. We would like to thank the following persons in particular: K. Lünnemann, F. Jongejan, W. Willems, S. Hol, and E. Leeman.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2020.581031/full#supplementary-material

REFERENCES

1. Stuurgroep multidisciplinaire Richtlijnontwikkeling in de GGZ. Richtlijn: Familiaal Huiselijk Geweld [Guideline: domestic violence within families]. Utrecht: Trimbos Instituut (2009).
2. Kamperman AM, Henrichs J, Bogaerts S, Lesaffre EM, Wierdsma AI, Ghauharali RR, et al. Criminal victimisation in people with severe mental illness: a multi-site prevalence and incidence survey in the Netherlands. *PLoS ONE.* (2014) 9:e91029. doi: 10.1371/journal.pone.0091029
3. Trevillion K, Oram S, Feder G, Howard LM. Experiences of domestic violence and mental disorders: a systematic review and meta-analysis. *PLoS ONE.* (2012) 7:e51740. doi: 10.1371/journal.pone.0051740
4. The National Institute of Mental Health Information Resource Center. *Mental Health Information: The National Institute of Mental Health Information Resource Center* [updated February 2019. Available online at: https://www.nimh.nih.gov/health/statistics/mental-illness.shtml#part_154788 (accessed May 18, 2020).
5. Ellsberg M, Jansen HA, Heise L, Watts CH, Garcia-Moreno C. Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study. *Lancet.* (2008) 371:1165–72. doi: 10.1016/S0140-6736(08)60522-X
6. Campbell JC. Health consequences of intimate partner violence. *Lancet.* (2002) 359:1331–6. doi: 10.1016/S0140-6736(02)08336-8
7. Ferrari G, Agnew-Davies R, Bailey J, Howard L, Howarth E, Peters TJ, et al. Domestic violence and mental health: a cross-sectional survey of women seeking help from domestic violence support services. *Glob Health Action.* (2016) 9:29890. doi: 10.3402/gha.v9.29890

8. Khalifeh H, Oram S, Osborn D, Howard LM, Johnson S. Recent physical and sexual violence against adults with severe mental illness: a systematic review and meta-analysis. *Int Rev Psychiatry.* (2016) 28:433–51. doi: 10.1080/09540261.2016.1223608
9. Silver E, Arseneault L, Langley J, Caspi A, Moffitt TE. Mental disorder and violent victimization in a total birth cohort. *Am J Public Health.* (2005) 95:2015–21. doi: 10.2105/AJPH.2003.021436
10. Swanson JW, Holzer CE, 3rd, Ganju VK, Jono RT. Violence and psychiatric disorder in the community: evidence from the Epidemiologic Catchment Area surveys. *Hosp Community Psychiatry.* (1990) 41:761–70. doi: 10.1176/ps.41.7.761
11. Choe JY, Teplin LA, Abram KM. Perpetration of violence, violent victimization, and severe mental illness: balancing public health concerns. *Psychiatr Serv.* (2008) 59:153–64. doi: 10.1176/ps.2008.59.2.153
12. Howard LM, Trevillion K, Khalifeh H, Woodall A, Agnew-Davies R, Feder G. Domestic violence and severe psychiatric disorders: prevalence and interventions. *Psychol Med.* (2010) 40:881–93. doi: 10.1017/S0033291709991589
13. Rose D, Trevillion K, Woodall A, Morgan C, Feder G, Howard L. Barriers and facilitators of disclosures of domestic violence by mental health service users: qualitative study. *Br J Psychiatry.* (2011) 198:189–94. doi: 10.1192/bjp.bp.109.072389
14. Feder G, Davies RA, Baird K, Dunne D, Eldridge S, Griffiths C, et al. Identification and Referral to Improve Safety (IRIS) of women experiencing domestic violence with a primary care training and support programme: a cluster randomised controlled trial. *Lancet.* (2011) 378:1788–95. doi: 10.1016/S0140-6736(11)61179-3
15. Trevillion K, Byford S, Carey M, Rose D, Oram S, Feder G, et al. Linking abuse and recovery through advocacy: an observational study. *Epidemiol Psychiatr Sci.* (2014) 23:99–113. doi: 10.1017/S2045796013000206
16. Ruijne RE, Howard LM, Trevillion K, Jongejan FE, Garofalo C, Bogaerts S, et al. Detection of domestic violence by community mental health teams: a multi-center, cluster randomized controlled trial. *BMC Psychiatry.* (2017) 17:288. doi: 10.1186/s12888-017-1399-7
17. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care.* (2007) 19:349–57. doi: 10.1093/intqhc/mzm042
18. Royal Dutch Medical Association. *KNMG-meldcode Kindermishandeling en huiselijk geweld*. Utrecht: Koninklijke Nederlandsche Maatschappij tot Bevordering der Geneeskunst (2015).
19. Boyatzis R. *Transforming Qualitative Information: Thematic Analysis and Code Development*. Thousands Oaks: Sage (1998).
20. Roulston K. Data analysis and 'theorizing as ideology'. *Qual Res.* (2001) 1:5. doi: 10.1177/146879410100100302
21. Nvivo. 12 ed: QRS international; QRS international.
22. Gilburt H, Rose D, Slade M. The importance of relationships in mental health care: a qualitative study of service users' experiences of psychiatric hospital admission in the UK. *BMC Health Serv Res.* (2008) 8:92. doi: 10.1186/1472-6963-8-92
23. Ruchlewska A, Wierdsma AI, Kamperman AM, van der Gaag M, Smulders R, Roosenschoon BJ, et al. Effect of crisis plans on admissions and emergency visits: a randomized controlled trial. *PLoS ONE.* 2014 9:e91882. doi: 10.1371/journal.pone.0091882
24. Robinson L, Spilsbury K. Systematic review of the perceptions and experiences of accessing health services by adult victims of domestic violence. *Health Soc Care Community.* (2008) 16:16–30. doi: 10.1111/j.1365-2524.2007.00721.x
25. Allen NE, Lehrer A, Mattison E, Miles T, Russel A. Promoting systems change in the health care response to domestic violence. *J Community Psychol.* (2007) 35:17. doi: 10.1002/jcop.20137
26. Gairns S, Alvarez-Jimenez M, Hulbert C, McGorry P, Bendall S. Perceptions of clinicians treating young people with first-episode psychosis for post-traumatic stress disorder. *Early Interv Psychiatry.* (2015) 9:12–20. doi: 10.1111/eip.12065
27. de Bont PA, van den Berg DP, van der Vleugel BM, de Roos C, de Jongh A, van der Gaag M, et al. Prolonged exposure and EMDR for PTSD v. a PTSD waiting-list condition: effects on symptoms of psychosis, depression and social functioning in patients with chronic psychotic disorders. *Psychol Med.* (2016) 46:2411–21. doi: 10.1017/S0033291716001094
28. van den Berg D, de Bont P, van der Vleugel BM, de Roos C, de Jongh A, van Minnen A, et al. Long-term outcomes of trauma-focused treatment in psychosis. *Br J Psychiatry.* (2018) 212:180–2. doi: 10.1192/bjp.2017.30
29. Trevillion K, Howard LM, Morgan C, Feder G, Woodall A, Rose D. The response of mental health services to domestic violence: a qualitative study of service users' and professionals' experiences. *J Am Psychiatr Nurses Assoc.* (2012) 18:326–36. doi: 10.1177/1078390312459747
30. Feder GS, Hutson M, Ramsay J, Taket AR. Women exposed to intimate partner violence: expectations and experiences when they encounter health care professionals: a meta-analysis of qualitative studies. *Arch Intern Med.* (2006) 166:22–37. doi: 10.1001/archinte.166.1.22
31. Domestic Violence and Abuse [Internet]. *National Institute for Health and Care Excellence*. (2016). Available online at: https://www.nice.org.uk/guidance/qs116 (accessed May 18, 2020).
32. Oram S, Capron L, Trevillion K. *Promoting Recovery in Mental Health: Evaluation Report*. London: King's College London (2016).
33. Hoyle C. Will she be safe? A critical analysis of risk assessment in domestic violence cases. *Child Youth Ser Rev.* (2008) 30:323–37. doi: 10.1016/j.childyouth.2007.10.009
34. Ruijne RE, Kamperman AM, Trevillion K, Garofalo C, Jongejan FE, Bogaerts S, et al. Mental health professionals' knowledge, skills and attitudes on domestic violence and abuse in the Netherlands: cross-sectional study. *BJPsych Open.* (2019) 5:e29. doi: 10.1192/bjo.2019.8

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

COMMUNITY CASE STUDY
published: 09 December 2020
doi: 10.3389/fpsyt.2020.601540

Supporting Female Survivors of Gender-Based Violence Experiencing Homelessness: Outcomes of a Health Promotion Psychoeducation Group Intervention

Ali Bani-Fatemi[1], *Monica Malta*[1], *Amanda Noble*[2], *Wei Wang*[1], *Thanara Rajakulendran*[1], *Deborah Kahan*[3] *and Vicky Stergiopoulos*[1,3]*

[1] Centre for Addiction and Mental Health, Toronto, ON, Canada, [2] Covenant House, Toronto, ON, Canada, [3] Department of Psychiatry, University of Toronto, Toronto, ON, Canada

Homelessness is an important risk factor for gender-based violence (GBV), particularly among youth, and disproportionally affects women and girls. Survivors of GBV experience enduring and severe physical, psychological, and sexual health problems. Although key elements in service delivery for survivors of GBV have been identified, little is known about outcomes of community-based programs aiming to assist homeless and unstably housed youth experiencing GBV. This longitudinal study aimed to quantitatively evaluate changes in mental health and well-being outcomes in female identified youth experiencing GBV and homelessness, 12 months after enrolment in a community-based, trauma-informed, brief group psychoeducation intervention. Standardized survey measures were administered at baseline, 6 and 12 months for 70 participants, recruited between February 2017 and April 2019, assessing quality of life, psychological distress, traumatic symptoms, substance use, resilience, victimization, and sense of mastery. Linear mixed models were used to examine longitudinal changes in quality of life as well as secondary outcomes among study participants. After 12 months, quality of life increased significantly among participants ($p = 0.009$), and the 12-month victimization score was significantly decreased relative to baseline ($p = 0.05$). Changes in other outcomes were not statistically significant. Findings suggest that community-based brief group psychoeducation interventions may be a promising approach to improving outcomes for this disadvantaged population.

Keywords: quality of life, homelessness, psychoeducation, mixed methods, trauma-informed intervention, gender-based violence (GBV), victimization

OPEN ACCESS

Edited by:
Haim Y. Knobler,
Hebrew University of Jerusalem, Israel

Reviewed by:
Christos Theleritis,
National and Kapodistrian University of Athens, Greece
Moshe Abramowitz,
Peres Academic Center, Israel

***Correspondence:**
Vicky Stergiopoulos
vicky.stergiopoulos@camh.ca

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *01 September 2020*
Accepted: *17 November 2020*
Published: *09 December 2020*

Citation:
Bani-Fatemi A, Malta M, Noble A, Wang W, Rajakulendran T, Kahan D and Stergiopoulos V (2020) Supporting Female Survivors of Gender-Based Violence Experiencing Homelessness: Outcomes of a Health Promotion Psychoeducation Group Intervention. Front. Psychiatry 11:601540. doi: 10.3389/fpsyt.2020.601540

INTRODUCTION

Gender-based violence (GBV) defined as any harmful act committed against a person because of his/her gender (1, 2) and disproportionately affects women and girls (3). Globally, one out of three women reports having been a victim of gender-based physical or sexual violence (4), including physical violence, sexual violence (such as sex trafficking, sexual exploitation, and sexual assault), psychological or emotional violence, and economic violence. Studies have shown that homelessness

in youth is an important risk factor for GBV, and homeless youth are more vulnerable to sexual exploitation and trafficking (5–7). Furthermore, the proportion of homeless women who have experienced GBV may be underestimated, as women are believed to be overrepresented among the hidden homeless, and as a result less likely to appear in homelessness data (8).

The impact of GBV is experienced long after the violence ends. The health-related impact of GBV includes physical injuries (9), chronic pain syndromes, memory problems, urogenital, cardiovascular, musculoskeletal, dermatological, eye, ear, and upper respiratory complaints, forced abortions, cervical cancer, and sexually transmitted infections (10–12). Mental health problems include depression, anxiety, posttraumatic stress disorder (PTSD), anger, dissociative disorders, grief, guilt, aggressive behaviors, self-harm and suicidal ideation (13–16), as well as substance use and dependence (17).

Apart from life-threatening physical and mental health consequences, survivors of GBV face a number of social consequences, including social isolation and marginalization (18). Lack of trust in the police, social services, or those in positions of authority may further isolate victims from seeking support or assistance (19).

Given the enduring sequelae of GBV, at risk populations, such as youth experiencing homelessness, have a high need for social and community supports. Recent literature reviews of strategies to prevent or reduce GBV or its sequelae suggest that although a number of interventions have shown promising findings, the paucity of evaluative efforts has led to inconsistencies in intervention activities and characteristics across settings (20). Interventions for intimate partner violence are extensively studied and offer women-centered, psychosocially supportive approaches that may be efficient in primary and secondary prevention of intimate partner violence (21). Moreover, trauma informed group therapy has been beneficial in reducing the negative psychological impacts experienced by survivors of sexual assault (22, 23), leading to a reduction in post-traumatic stress symptoms and risk-taking behaviors, and improvements in perceived empowerment, knowledge, and application of coping strategies (22). Although a wide range of interventions to support youth experiencing homelessness have been identified, including individual and family therapies, skill building programs, case management, and structural interventions (24), little is known about community programs aiming to assist youth experiencing GBV and homelessness or housing instability. The dearth of research in this area leaves service providers (e.g., counselors, social workers, and therapists) with little guidance on how to best support this population.

This longitudinal observational study, part of a realist informed evaluation using mixed methods, aimed to quantitatively evaluate changes in quality of life (primary outcome), psychological distress, traumatic symptoms, substance use, resilience, victimization, and sense of mastery (secondary outcomes) in young women experiencing GBV and homelessness, 12 months after enrolment in a community-based, trauma-informed, group psychoeducation intervention. It was hypothesized that the intervention may lead to improved quality of life, resiliency, and a sense of mastery and reduced mental health symptoms, substance use and victimization in this population.

METHODS

Setting

Covenant House Toronto (CHT) is a large community-based organization in Toronto, Canada, offering an on-site crisis shelter, school, and transitional housing services, as well as counseling, health care, employment assistance, and other community-based services to youth experiencing homelessness. Given the high prevalence of GBV in this population, CHT, funded by the Public Health Agency of Canada, launched as part of a broader 5-year strategy to support women and girls experiencing GBV and homelessness, a brief group psycho-education health promotion intervention, the Peer Education and Connection through Empowerment (PEACE) program.

Intervention Description

The PEACE program, launched in 2017, is a community-based group psychoeducation intervention for female identified youth aged 16 to 24 experiencing GBV and homelessness (25). Co-facilitated by trained peer mentors, the program has sought to empower and support survivors of GBV, offering weekly trauma-informed psychoeducation groups over 16 weeks to promote health and well-being. The program has used a community development participatory action framework wherein program participants become active agents of change to address power differentials, intersectional issues, systemic barriers to care, and well-being and social isolation—all of which are major concerns for this vulnerable population. Under the mentorship of the health promotion coordinator and peer mentors, participants are supported and encouraged to engage in discussions and share ideas for the curriculum based on their needs and preferences. Content typically includes identity formation, self-image, women's health, healthy relationships, coping mechanisms, and leadership. Moreover, participants engage in a range of social activities, including yoga, arts and crafts, and meal preparation. Groups have approximately 8 participants each in order to allow for a safe and confidential space as well as a high level of support during the intervention. A mental health counselor and a mobile crisis team are also available to support participants and connect to other resources and supports as needed. To evaluate the intervention, CHT partnered with the Center for Addiction and Mental Health (CAMH), affiliated with the University of Toronto. The study protocol was approved by both the CAMH and the University of Toronto Institutional Research Ethics Boards.

Study Design and Participants

The present study was part of a non-experimental realist-informed longitudinal evaluation using mixed methods to enable a rich understanding of the program and its context and explore ideas and outcomes relevant to the needs of knowledge users (26, 27).

Qualitative methods were used to examine barriers to implementation (28), as well as participant perspectives on the

impact of the intervention on their wellness and recovery (29). In these studies, participants described valuing the safe, respectful, women-only space, the multiple shared lived experiences, and tailored psychoeducation, and reported perceived improvements in self-confidence, coping ability, health, relationships, and future directedness, as a result of participation (29). Notably, there were no premature drop-outs from the program during the study period.

The present study describes key participant outcomes 12 months after program enrolment. Study participants ($n = 70$) were recruited among successive service users of the PEACE program between February 2017 and April 2019 (**Figure 1**). The study drop-out rate at 6- and 12-months of follow-up were 11.43 and 1.78%, respectively (**Figure 1**). Written informed consent was obtained from all participants. Inclusion criteria for the study included: survivors of GBV aged between 16 to 24 years, enrollment in the PEACE program, verbal proficiency in English, and capacity to consent to research participation.

Data Collection

Several standardized survey measures, detailed below, were administered by trained research staff at baseline, 6-month, and 12-months. The primary outcome examined was quality of life. Secondary outcomes included victimization, resiliency, psychological distress, substance use, level of mastery, and traumatic stress symptoms among study participants. Demographic information was collected at baseline using survey questions developed for the study by the principal investigator.

Survey Measures

WHO Quality of Life, Shortened Version (WHOQOL-BREF)

This standardized measure, including 26 questions, assesses participants' quality of life in four domains—(2) Physical health, (3) Psychological health, (5) Social relationships, and (6) Environment. Using the measure, it is possible to drive four domain scores, in addition to a total score. Domain scores are scaled in a positive direction that means higher scores denote a higher quality of life. WHO QOL-BREF domain scores have demonstrated good discriminant validity, content validity, internal consistency and test & retest reliability. The measure was also found to have good to excellent reliability and validity (30).

Hospital Anxiety and Depression Scale (HADS)

This standardized measure is a self-report rating scale of 14 items on a 4-poing Likert scale ranging between 0 and 3. The HADS produces two subscales: the A-scale measuring Anxiety and the D-scale measuring Depression, which have 7 items each and are scored separately. The A-scale covers the state of anxious mood, restlessness, and anxious thoughts. The D-scale focuses upon loss of interest and diminished pleasure response. The scale is validated among adolescents (31) as well as adults (32). Scores range from 0 to 21 for each subscale with higher scores suggesting higher severity of anxiety or depression.

Connor-Davidson Resiliency Scale (CD-RISC2)

The CD-RISC2 is a two-item scale that is a briefer version of the full 25-item CD-RISC (33) and was developed as a measure of bounce-back and adaptability. The CD-RISC2 has demonstrated significant correlation with both the overall CD-RISC score and with the individual items of the CD-RISC, suggesting that the two items of the CD-RISC2 are appropriate representatives of the overall scale and the CD-RISC2 can be utilized in place of the CD-RISC (33). Similar to CD-RISC, the 2-item scale shows good test-retest reliability, convergent validity, and divergent validity. The CD-RISC2 range from 0 to 8 and higher scores indicate higher resilience.

Global Assessment of Individual Need—Substance Problem Scale (GAIN-SPS)

To measure substance use severity, we used the 7-item GAIN-SPS scale (34). The severity of substance use problems is calculated by summing the number of substance-related problems reported in the past month (range from 0 to 5). The GAIN-SPS has been found to have excellent internal consistency, good concurrent validity with objective measures of substance use, and good discriminant validity for detecting the presence of a substance use diagnosis (34). A higher score shows higher substance use severity.

Adverse Childhood Experiences (ACE)

This standardized measure captures the extent and nature of childhood experiences of neglect and abuse as well as family dysfunction such as domestic violence and alcohol or drug problems. The ACE is a 10-item self-report measure and has been found to have good reliability among adolescents (35) as well as adults (36). Each positive answer is assigned one point and the final score (0–10) is known as the ACE score. Participants with more difficulties in childhood have a higher ACE score.

Selected Questions From 2014 Stats Canada General Social Survey (GSS) Victimization Module

Selected questions focusing on physical violence and other kinds of crime was used to assess participants' experiences of victimization within the past six months. The GSS has been extensively used in Canadian populations aged 15 and over (37). Higher total scores indicate higher experience of victimization.

Pearlin Mastery Scale

This standardized measure by Pearlin and Schooler (38) was used to assess how strongly participants agreed with statements asserting feelings of self-mastery, an aspect of coping skills. This 7-item scale includes five negatively worded items and two positively worded items on a 4-point Likert scale ranging between 1 and 4. The negatively worded items need reverse coding prior to scoring, resulting in a score range between 7 and 28. Higher scores represent greater levels of mastery. The psychometric properties are well tested (38) and several studies have tested its validity among homeless adult populations (39).

UCLA-PTSD Reaction Index—DSM V (excluding clinical assessment section)

This scale was used to assess presence or absence of posttraumatic stress symptoms among study participants. The earlier version of the scale (UCLA-PTSD Reaction Index—DSM IV) has been used to assess a variety of traumatic experiences such as natural

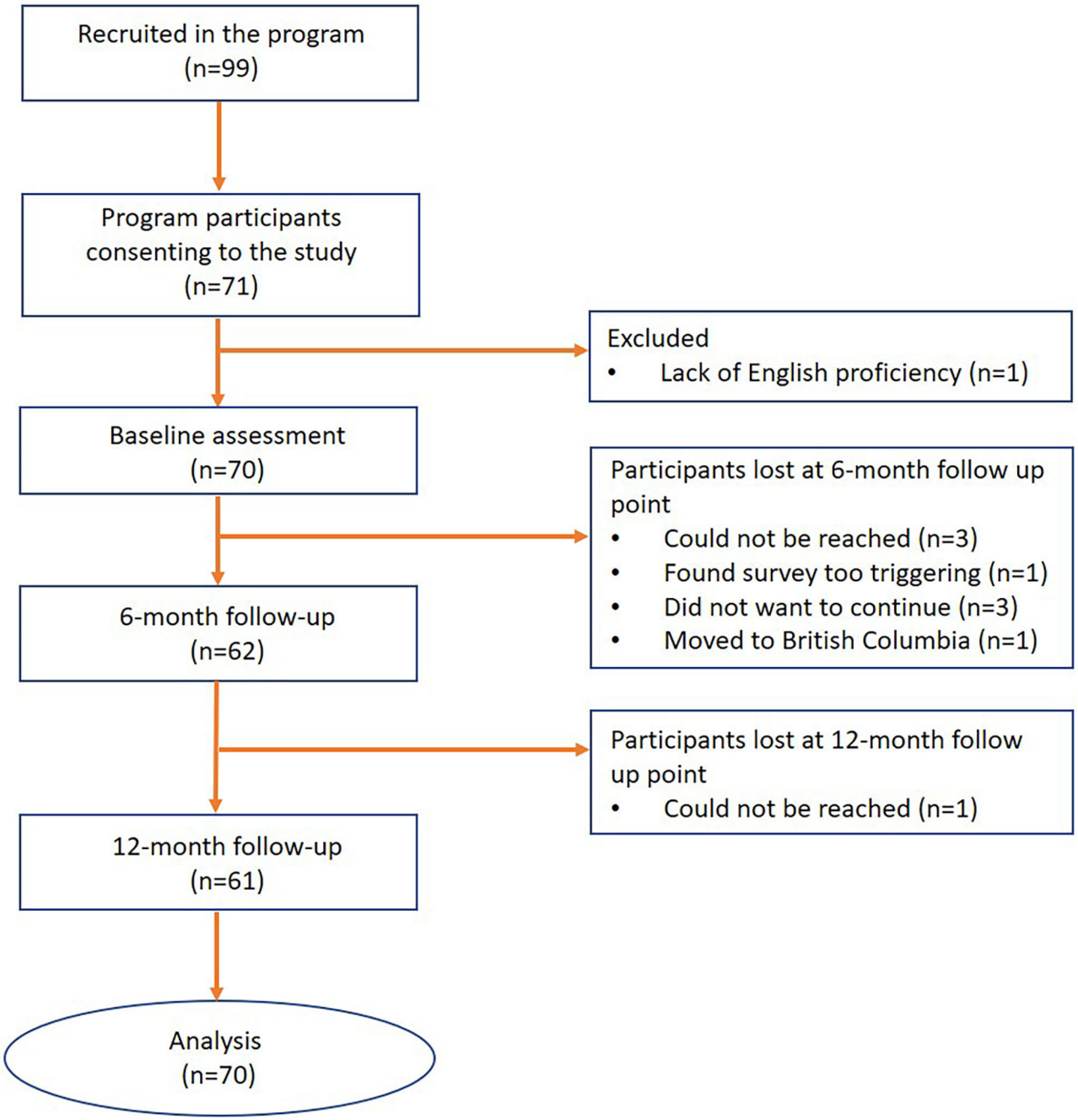

FIGURE 1 | Study flowchart.

disasters, political violence, school/community violence (40). The scale assesses the frequency of occurrence of PTSD symptoms during the past month rated from 0 (none of the time) to 4 (most of the time). Participants with higher traumatic stress symptoms have higher score. The scale has been found to have good reliability and validity for adults as well as youth between 16 to 18 years of age (41).

Data Analysis

To address missing data pertaining to loss to follow up, missing scales, or missing items within scales, multiple imputation by chained equations (MICE) was conducted using the MICE package in R (42). The dataset with all variables, including baseline and each follow-up point was used, assuming missing at random (MAR). Further analyses were carried out using

TABLE 1 | Demographic characteristics of study participants ($N = 70$).

Demographic variables		Frequency (*n*)	Percent (%)
Race	Black	26	37.1
	White	16	22.9
	Other	28	40
Education Level	Completed grade 5-8	2	2.9
	Attended high school (not completed)	30	42.9
	Completed high school	17	24.3
	Attended business, trade, technical school	7	10
	Attended University, not completed	8	11.4
	Completed undergraduate education	6	8.6
Participants with Children	-	11	15.7
Continuous Work in the Past Year	-	9	12.9
Number of Adverse Childhood Experiences (ACE score)	0	3	4.3
	1	3	4.3
	2	1	1.4
	3	5	7.1
	4 or more	58	82.9

SPSS Statistics, version 25. Descriptive statistical analysis (means and standard deviation) was performed to examine participants' socio-demographic characteristics, mental health, alcohol and substance use, and quality of life. Linear mixed models were used to examine longitudinal changes in outcomes among study participants. We evaluated the effect of time (in months), baseline covariates, and the interaction between time and covariates. To avoid overfitting by including too many covariates, we only included variables for which there was a significant bi-variate association with quality of life including ACE, race, and place of birth ($p < 0.05$).

RESULTS

Demographic and Clinical Characteristics

Table 1 shows the baseline socio-demographic characteristics and ACE scores of study participants. The mean age of participants at enrollment was 21.47 years (SD: 3.79). Nearly half of the participants (48.6%) were born in Canada. Over a third of participants were black (37.2%), while 22.8% were white and 40% reported other ethnicities; Two individuals (2.8%) reported being married, while 11 participants (16%) reported having children. Two of the participants (2.8%) identified as transgendered, one participant disclosed her gender as both female and male, and one participant did not disclose their gender.

Nearly half (45.7%) of the participants did not complete high school, 24.3% completed high school, and 30% had some postsecondary education. The average total ACE score among participants was 6.14 (SD: 2.90), with most participants (82.9%) having a total ACE score of 4 or more, and only 4.3% reporting no adverse childhood experiences. The most common ACE reported was emotional abuse (75.7%), while physical neglect was the least commonly reported ACE (34.3%). The most common type of GBV described was family violence, reported by 64% of the participants. Many of our participants ($n = 45$ or 64.3%) experienced more than one type of GBV, while three of the participants (4.3%) did not disclose the type of violence experienced. To identify what baseline variables were associated with the outcomes of interest, a linear regression analysis of demographic variables in association with the outcome measures at baseline was conducted. ACE scores were found to be negatively associated with psychological health ($t = -2.33$, $p = 0.02$) and overall quality of life ($t = -2.99$, $p = 0.004$) and positively with victimization ($t = 2.23$, $p = 0.029$), while race was negatively associated with physical health ($t = -2.06$, $p = 0.04$), psychological health ($t = -2.19$, $p = 0.03$), and overall quality of life ($t = -2.83$, $p = 0.006$). After adjusting for race, the total ACE score was significantly associated only with overall quality of life (AOR, 95% CI: 0.70, 0.54-0.91). In addition, victimization (1.65, 0.97-2.79), psychological health (0.83, 0.67-1.02), and traumatic stress symptoms (1.02, 0.99-1.05) showed a trend toward a higher total ACE score.

At baseline participants born in Canada had a significantly lower score of physical health (1.41, 1.13-1.76), psychological health (1.25, 1.06-1.47), environment (1.41, 1.09-1.83), overall quality of life (1.28, 1.07 = 1.52), and a significantly higher score of HADS-anxiety (0.80, 0.69 = 0.93), and traumatic stress symptoms (0.97, 0.95-0.99) compared to those who migrated to Canada. In addition, immigrants to Canada had significantly higher substance use problem scores (0.26, 0.08-0.85) than individuals with temporary status in Canada (work permit, domestic help, visitor, student, refugee claimant).There were no significant differences in baseline outcome measures between participants with and without children, complete and incomplete high school, and participants with and without continuous work in the past year.

Primary and Secondary Outcomes at 12 Months

The overall quality of life score increased significantly over 12 months ($F = 5.585$, $p = 0.004$) (**Table 2**) among participants, although increases in individual domains of quality of life were not significant.

Similarly, the experience of victimization decreased significantly over 12 months ($F = 4.009$, $p = 0.02$) (**Table 2**) among participants, with the 12-month victimization scores significantly decreased compared to baseline ($p = 0.05$) (**Table 2**). There were no significant changes in anxiety or depression scores at 12 months, relative to baseline (**Table 2**). Similarly, there were no significant changes in substance use problem scores, resiliency scores, or PTSD symptoms at 12 months, relative to baseline (**Table 2**), and no significant improvements over the course of 12 months (**Table 2**).

An interaction analysis between time and baseline covariates (ACE scores, race, education level, having children, continuous

TABLE 2 | Outcomes of a brief psychoeducation group intervention for female identified youth survivors of GBV experiencing homelessness ($N = 70$).

Outcomes	Baseline	6-month			12-month			Overall *p*-value
	Mean (SD)	Mean (SD)	Difference from baseline (95% CI)	*p*-value	Mean (SD)	Difference from baseline (95% CI)	*p*-value	
WHOQOL (Physical health)	13.96 (2.71)	14.45 (2.54)	−0.488 (-1.650 to 0.674)	0.93	14.49 (2.69)	−0.527 (-1.702 to 0.648)	0.84	0.46
WHOQOL (Psychological health)	12.36 (3.47)	13.39 (3.43)	−1.032 (-2.512 to 0.447)	0.28	13.37 (3.19)	−1.010 (-2.505 to 0.486)	0.31	0.15
WHOQOL (Social relationship)	13.28 (3.30)	13.63 (3.79)	−0.353 (-1.903 to 1.196)	0.99	13.76 (3.57)	−0.480 (-2.047 to 1.086)	0.99	0.74
WHOQOL (Environment)	13.15 (2.37)	13.89 (2.60)	−0.738 (-1.810 to 0.334)	0.29	13.90 (2.39)	−0.753 (-1.836 to 0.331)	0.28	0.14
WHOQOL (Overall)	12.54 (3.43)	14.11 (3.26)	−1.568 (-3.028 to−0.108	**0.03**	14.38 (3.27)	−1.842 (-3.317 to−0.366)	**0.009**	**0.004**
Victimization	1.63 (1.86)	0.91 (1.44)	0.721 (-0.014 to 1.457)	0.057	0.88 (1.64)	0.744 (0.0004 to 1.487)	**0.050**	**0.02**
HADS – A Scale	10.86 (4.00)	9.65 (4.63)	1.209 (-0.635 to 3.053)	0.34	10.06 (4.02)	0.799 (-1.064 to 2.663)	0.90	0.27
HADS – D Scale	7.04 (3.95)	6.24 (3.10)	0.802 (-0.778 to 2.383)	0.66	5.96 (3.62)	1.158 (-0.439 to 2.756)	0.24	0.19
GAIN-SPS	0.77 (1.34)	0.54 (0.92)	0.234 (-0.284 to 0.753)	0.83	0.54 (1.19)	0.233 (-0.291 to 0.757)	0.85	0.44
UCLA-PTSD	58.84 (25.99)	49.61 (26.38)	9.232 (-2.455 to 20.919)	0.17	51.63 (27.91)	7.208 (-4.605 to 19.022)	0.43	0.13
CD-RISC2	7.73 (1.57)	8.17 (1.50)	−0.438 (-1.105 to 0.229)	0.34	7.65 (1.48)	0.075 (-0.599 to 0.749)	0.99	0.16
Mastery Scale	17.64 (2.50)	17.44 (2.12)	0.198 (-0.772 to 1.169)	0.99	17.50 (1.88)	0.143 (-0.838 to 1.124)	0.99	0.87

The bold values indicate statistical significance ($p \leq 0.05$).

work in the past year, place of birth, and immigration status) identified no significant association of any covariates with primary and secondary outcomes.

DISCUSSION

Although several studies have described the impact of interventions on homeless youth health and well-being, the literature on community-based interventions addressing GBV in this population is scant. Prior research with individuals experiencing GBV suggested that community-based, trauma-informed group interventions can improve mental health and quality of life by promoting personal growth and increasing self-esteem, empowerment, and coping skills in adolescent girls victims of sexual violence (23, 43, 44).

The study, part of a realist informed longitudinal evaluation of a community-based 16-week psychoeducation group intervention, identified improvements in quality of life, capturing physical, psychological health, social relationships, and the overall environment, and reductions in experiences of victimization among female identified youth experiencing GBV and homelessness 12 months following enrolment, with no significant changes in other health and well-being outcomes. Prior qualitative research by our team revealed that participants valued the safe, women-only space, the shared lived experiences, and tailored psychoeducation, suggesting the intervention is acceptable to service users (29). Furthermore, our findings of improved quality of life and reduced experiences of victimization are supported by prior qualitative findings by our team, highlighting perceived improvements in self-confidence, coping, health, interpersonal relationships, and future directedness as a result of program participation (29).

Our findings of improved overall quality of life scores are also consistent with prior research demonstrating positive impacts of some interventions on quality of life in female victims of GBV. Using a violence intervention program, Levas et al. (45) found increased scores in most domains of health-related quality of life after six weeks among youth aged between 8 and 18 years who attended a violence intervention summer camp in a Midwest urban city. Similarly, a study by Cripe et al. (46) found a trend toward improved quality of life among women survivors of intimate partner violence receiving supportive counseling focused on empowerment, compared to usual care.

Similar to other interventions such as community mobilization and group-based empowerment training (47), this trauma-informed psychoeducation intervention significantly reduced experiences of victimization 12 months after program entry. These findings are supported by prior research by Gilbert et al. (48), indicating that a brief intervention and referral to services may be effective in reducing physical and verbal intimate partner violence and physical violence in female

survivors of GBV with substance use disorders. In contrast, several other intervention strategies such as awareness-raising campaigns (population-based prevention), home visitation and health worker outreach, personnel training, justice and law-enforcement interventions, have not been shown to reduce victimization in survivors of intimate partner violence or non-partner sexual violence (47). Among homeless youth, a mindfulness-based, cognitive, skill-building intervention for promoting risk detection to prevent various types of victimization suggested significant improvements in risk detection abilities in the intervention, compared to the control group (49).

We identified no significant improvements in substance use or trauma symptom severity, resiliency, or sense of mastery at 12 months. Lack of significant changes over time in these domains may suggest that the intervention was not effective in addressing these areas, and that more targeted interventions are needed to observe improvements in these outcomes. It is also possible, given the modest number of individuals with substance use disorders in our sample (32.8%), that the study was not sufficiently powered to identify changes in in this and other domains. In contrast, Gilbert et al. (48) found a significant positive impact on substance use over a 3-month period following a brief intervention and referral service for women survivors of GBV with substance use disorders. Similarly, among homeless youth, studies by Slesnick et al. (50, 51) demonstrated that a cognitive-behavioral intervention significantly improved measures of substance abuse among homeless intervention group participants, compared to control group participants. Given the association between female substance use and experiences of GBV in several studies (52–54), access to targeted interventions to address substance use are important program components for victims of GBV. Finally, studies have shown that social support and empowerment training can significantly reduce the symptoms of psychological distress such as anxiety and depression in victims of intimate partner violence (55, 56) and evidence-informed psychological interventions have the potential to reduce PTSD symptoms in women affected by GBV. Of note, PTSD, anxiety, depression and substance use were not specifically targeted in the intervention under study, although participants were offered information on relevant resources. To improve these outcomes, consideration should be given to engaging service user and provider stakeholders in program improvements, including seamless access to trauma-specific and substance use services, for those who need them.

Nearly 83% of study participants had an ACE score $\geq$ 4, much higher than the reported prevalence of ACE in a national sample of homeless youth with mental illness in Canada, where approximately half of the participants had an ACE score $\geq$ 4 (57). Several studies have identified a significant association between ACEs and different types of GBV such as intimate partner violence and family violence, and our findings add to the knowledge based on homeless youth specifically. We found no association between ACE scores and changes in outcomes over time.

GBV remains one of the most persisting and widespread problems faced by women and girls worldwide (58). Addressing the sequelae of GBV requires an understanding of the complex underlying social and/or economic factors, including housing stability. Given the high prevalence of GBV among girls and women experiencing homelessness (59), programs addressing GBV among homeless and marginally housed women and girls are urgently needed.

Trauma-informed care is a key component and philosophy in service delivery to survivors of GBV and has been found to play an essential role in the recovery of GBV survivors as well as homeless youth (60, 61). In addition to trauma-informed principles, trauma specific interventions may be needed to improve health outcomes of survivors of GBV experiencing homelessness, tailored to the needs of specific subpopulations. Although the literature on available interventions is growing, these is a paucity of studies examining how best to engage young women and girls experiencing homelessness in such interventions, which should be the focus of future research.

Study strengths include the uniqueness of the setting and paucity of prior research with this vulnerable population. Furthermore, the intervention was co-designed with service users, co-delivered with peer mentors, and found acceptable and valuable to the target population. Finally, the parent study included both qualitative and quantitative components, to comprehensively explore perspectives, experiences and outcomes of interest to all key stakeholders.

Although we estimated that our sample size had over 80% power to detect significant changes from baseline to 12 months in key outcomes, the small sample size was one of the limitations in this study. In addition, this is an observational, non-experimental study, and findings need to be interpreted with caution, although qualitative data support multiple perceived benefits of the intervention by study participants. Finally, the intervention was offered in Toronto, Canada, and findings may not be generalizable to other settings with different availability of resources and supports for this population. Further research should consider quasi-experimental studies with a control group of participants and randomized controlled trials, including wait-list controls.

CONCLUSION

A brief, community-based, trauma-informed, group psychoeducation intervention may be helpful in improving the quality of life and reducing experiences of victimization among female identified youth experiencing homelessness and GBV. Further research, using experimental designs, is needed to examine the effect of interventions aiming to improve outcomes in this disadvantaged population, as well as to advance strategies to engage homeless youth in such interventions.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Center for Addiction and Mental Health (CAMH) and the University of Toronto Institutional Research Ethics Boards. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

AB-F analyzed the data, and led the preparation of the manuscript. TR assisted in participant recruitment and data collection. WW assisted in statistical analysis. MM, AN, DK, and VS provided expert advice and aided in manuscript revisions. VS developed the study design and secured study funding. All authors contributed to the article and approved the submitted version.

FUNDING

This project was supported by the Public Health Agency of Canada.

ACKNOWLEDGMENTS

We would like to acknowledge the support of the Public Health Agency of Canada, and thank study participants for their contributions to the intervention and its evaluation.

REFERENCES

1. Status of Women Canada. *About Gender-Based Violence*. (2018). Available online at: https://www.swc-cfc.gc.ca/violence/strategy-strategie/gbv-vfs-en.html#fn4.
2. Conroy S, Cotter A. *Statistics Canada. Self-Reported Sexual Assault in Canada 2014*. Ottawa (2017).
3. Perreault S. *Criminal Victimization in Canada 2014. Canadian Centre for Justice Statistics*. (2015). Available online at: Retrieved from: https://www150.statcan.gc.ca/n1/pub/85-002-x/2015001/article/14241-eng.htm.
4. United Nations Population Fund. *Gender-Based Violence*. (2018). Available online at: https://www.unfpa.org/gender-based-violence.
5. Petering R, Rice E, Rhoades H, Winetrobe H. The social networks of homeless youth experiencing intimate partner violence. *J Interpers Violence.* (2014) 29:2172–91. doi: 10.1177/0886260513516864
6. Ijadi-Maghsoodi R, Cook M, Barnert E, Gaboian S, Bath E. Understanding and responding to the needs of commercially sexually exploited youth. *Child Adolesc Psychiatr Clin N Am*. (2016) 25:107–22. doi: 10.1016/j.chc.2015.08.007
7. Kidd SA, Gaetz S, O'Grady B. The 2015 national Canadian homeless youth survey: Mental health and addictions findings. *Can J Psychiatry.* (2017) 62:493–500. doi: 10.1177/0706743717702076
8. Maki K. *Housing, Homelessness, and Violence Against Women: A Discussion Paper*. Ottawa, ON: Women's Shelter Canada. (2017) Available online at: https://www.homelesshub.ca/sites/default/files/attachments/Housing%2C%20Homelessness%2C%20and%20VAW%20Discussion%20Paper%20Aug%202017.pdf.
9. Carbone-López K, Kruttschnitt C, Macmillan R. Patterns of intimate partner violence and their associations with physical health, psychological distress, substance use. *Public Health Rep.* (2006) 121:382–92. doi: 10.1177/003335490612100406
10. Coker AL, Smith PH, Bethea L, King MR, Mckeown RE. Physical health consequences physical and psychological intimate partner violence. *Arch Fam Med.* (2000) 9:451–7. doi: 10.1001/archfami.9.5.451
11. Raymond JG, Hughes DM, Gomez C. *Sex Trafficking of Women in the United States: International and Domestic Trends*. Washington, DC: National Institute of Justice. (2001). doi: 10.1037/e624522007-001
12. Oram S, Stockl H, Busza J, Howard LM, Zimmerman C. Prevalence and risk of violence and the physical, mental, and sexual health problems associated with human trafficking: systematic review. *PLoS Med.* (2012) 9:e1001224. doi: 10.1371/journal.pmed.1001224
13. Hossain M, Zimmerman C, Abas M, Light M, Watts C. The relationship of trauma to mental disorders among trafficked and sexually exploited girls and women. *Am J Public Health.* (2010) 100:2442–9. doi: 10.2105/AJPH.2009.173229
14. Kiss L, Yun K, Pocock N, Zimmerman C. Exploitation, violence, and suicide risk among child and adolescent survivors of human trafficking in the greater mekong subregion. *JAMA Pediatr*. (2015) 169:e152278. doi: 10.1001/jamapediatrics.2015.2278
15. Hampton DeCoux M, Shade K. The experience of adolescent victims of commercial sexual exploitation in the United States: a qualitative systematic review protocol. *JBI Database Syst Rev Implement Rep.* (2015) 13:110–19. doi: 10.11124/01938924-201513080-00012
16. Bonomi A, Anderson ML, Reid R, Rivara F, Carrell D, Thompson R. Medical and psychological diagnoses in women with a history of intimate partner violence. *Arch Int Med.* (2009) 169:162–97. doi: 10.1001/archinternmed.2009.292
17. Devries K, Watts C, Yoshihama M, Kiss L, Schraiber LB, Deyessa N, et al. Violence against women is strongly associated with suicide attempts: Evidence from the WHO Multi-country Study on Women's Health and Domestic Violence against Women. *Soc Sci Med.* (2011) 73:79–86. doi: 10.1016/j.socscimed.2011.05.006
18. Wilson B, Butler LD. Running a gauntlet: A review of victimization and violence in the pre-entry, post-entry, and peri-/post-exit periods of commercial sexual exploitation. *Psychol Trauma.* (2014) 6:494–504. doi: 10.1037/a0032977
19. Kurtz SP, Surratt HL, Kiley MC, Inciardi JA. Barriers to health and social services to Street-based sex workers. *J Health Care Poor Underserved.* (2005) 16:345–61. doi: 10.1353/hpu.2005.0038
20. Tappis H, Freeman J, Glass N, Doocy S. Effectiveness of interventions, programs and strategies for gender-based violence prevention in refugee populations: an integrative review. *PLoS Curr Dis.* (2016) 1:5499. doi: 10.1371/currents.dis.3a465b66f9327676d61eb8120eaa5499
21. Arango DJ, Morton M, Gennari F, Kiplesund S, Ellsberg M. *Interventions to Prevent or Reduce Violence Against Women and Girls: A Systematic Review of Reviews. Women's Voice and Agency Research Series*. Washington, DC: World Bank Group (2014). Available online at: http://documents.worldbank.org/curated/en/700731468149970518/pdf/927130NWP0Wome00Box385382B00PUBLIC0.pdf.
22. Lundqvist G, Svedin CG, Hansson K, Broman I. Group therapy for women sexually abused as children: mental health before and after group therapy. *J Interpers Viol.* (2006) 21:1665–77. doi: 10.1177/0886260506294986
23. Tourigny M, Hébert M, Daigneault I, Simoneau AC. Efficacy of a group therapy for sexually abused adolescent girls. *J Child Sex Abuse.* (2005) 14:71–93. doi: 10.1300/J070v14n04_04
24. Wang JZ, Mott S, Magwood O, Mathew C, Mclellan A, and Kpade V, et al. The impact of interventions for youth experiencing homelessness on housing, mental health, substance use, and family cohesion: a systematic review. *BMC Public Health*. (2019) 19:1528. doi: 10.1186/s12889-019-7856-0
25. Kahan D, Noble AJF, Stergiopoulos V. PEACE: trauma-informed psychoeducation for female-identified survivors of gender-based violence. *Psychiatr Serv*. (2018) 69:733. doi: 10.1176/appi.ps.69601
26. Patton MQ. *Utilization-Focused Evaluation*. Thousand Oaks, CA: Sage Publications (2008).
27. Pawson R, Tilley N. *Realistic Evaluation*. London: Sage publications (1997).
28. Kahan D, Lamanna D, Rajakulendran T, Noble A, Stergiopoulos V. Implementing a trauma-informed intervention for homeless female survivors

of gender-based violence: lessons learned in a large Canadian urban centre. *Health Soc Care Community.* (2020) 28:823–32. doi: 10.1111/hsc.12913
29. Reid N, Kron A, Rajakulendran T, Kahan D, Noble A, Stergiopoulos V. Promoting wellness and recovery of young women experiencing gender-based violence and homelessness: the role of trauma-informed health promotion interventions. *Viol Against Women*. (2020) 23:1077801220923748. doi: 10.1177/1077801220923748
30. Skevington,S. M., Lotfy M. O'Connell KA. The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial: a Report from the WHOQOL Group. *Qual Life Res.* (2004) 13:299–310. doi: 10.1023/B:QURE.0000018486.91360.00
31. White D, Leach C, Sims R, Atkinson M, Cottrell D. Validation of hospital anxiety and depression scale for use with adolescents. *Br J Psychiatry.* (1999) 175:452–4. doi: 10.1192/bjp.175.5.452
32. Hermann C. International experiences with the hospital anxiety and depression scale - a review of validation data and clinical results. *J Psychosom Res.* (1997) 42:17–41. doi: 10.1016/S0022-3999(96)00216-4
33. Vaishnavi S, Connor K, Davidson JRT. An abbreviated version of the Connor-Davidson Resilience Scale (CD-RISC), the CD-RISC2: psychometric properties and applications in psychopharmacological trials. *Psychiatry Res.* (2007) 152:293–7. doi: 10.1016/j.psychres.2007.01.006
34. Dennis ML, Chan YF, Funk RR. Development and validation of the GAIN short screener for internalizing, externalizing and substance use disorders and crime violence problems among adolescents and adults. *Am. J.Addict.* (2006) 15:80–91. doi: 10.1080/10550490601006055
35. Pinto R, Correia L, Maia A. Assessing the reliability of retrospective reports of adverse childhood experiences among adolescents with documented childhood maltreatment. *J Fam Viol.* (2014) 29:431–8. doi: 10.1007/s10896-014-9602-9
36. Dube SR, Williamson DF, Thompson T, Felitti VJ, Anda RA. Assessing the reliability of retrospective reports of adverse childhood experiences among adult HMO members attending a primary care clinic. *Child Abuse Negl.* (2004) 28:729–37. doi: 10.1016/j.chiabu.2003.08.009
37. Statistics Canada. *General Social Survey - Victimization: Detailed Information for 2014. (Cycle 28: Canadians' Safety).* (2016). Available online at: http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=4504
38. Pearlin LI, Schooler C. The structure of Coping. *J Health Soc Behav.* (1978) 19:2–21. doi: 10.2307/2136319
39. Greenwood RM, Schaefer-McDaniel NJ, Winkel G, Tsemberis SJ. Decreasing psychiatric symptoms by increasing choice in services for adults with histories of homelessness. *Am J Community Psychol.* (2005) 36:223–38. doi: 10.1007/s10464-005-8617-z
40. Steinberg AM, Brymer MJ, Decker KB, Pynoos RS. The University of California at Los Angeles post-traumatic stress disorder reaction index. *Curr Psychiatry Rep.* (2004) 6:96–100. doi: 10.1007/s11920-004-0048-2
41. Steinberg AM, Brymer MJ, Kim S, Briggs EC, Ippen CG, Ostrowski SA, et al. Psychometric properties of the UCLA PTSD reaction index: part I. *J Trauma Stress.* (2013) 26:1–9. doi: 10.1002/jts.21780
42. van Buuren S, and Groothuis-Oudshoorn K. Mice: multivariate imputation by chained equations in R. *J Stat Softw.* (2011) 45:1–67. doi: 10.18637/jss.v045.i03
43. Avinger KA, Jones RA. Group treatment of sexually abused adolescent girls: a review of outcome studies. *J Fam Ther.* (2007) 35:315–26. doi: 10.1080/01926180600969702
44. Hickle K, Roe-Sepowitz DE. Putting the pieces back together: A group intervention for sexually exploited adolescent girls. *Soc Work Groups.* (2014) 37:99–113. doi: 10.1080/01609513.2013.823838
45. Levas MN, Boyle EA, Melzer-Lange M, Panepinto J. Improvement in quality of life among violently injured youth after a brief intervention. *J Trauma Acute Care Surg.* (2016) 81:S61–S6. doi: 10.1097/TA.0000000000001061
46. Cripe SM, Sanchez SE, Sanchez E, Ayala Quintanilla B, Hernández Alarcon C, Gelaye B, et al. Intimate partner violence during pregnancy: a pilot intervention program in Lima, Peru. *J Interpers Viol.* (2010) 25:2054–76. doi: 10.1177/0886260509354517
47. Ellsberg M, Arango DJ, Morton M, Gennari F, Kiplesund S, Contreras M, et al. Prevention of violence against women and girl: what does the evidence say? *Lancet.* (2015) 385:1555–66. doi: 10.1016/S0140-6736(14)61703-7
48. Gilbert L, Jiwatram-Negron T, Nikitin D, Rychkova O, McCrimmon T, Ermolaeva I, et al. Feasibility and preliminary effects of a screening, brief intervention and referral to treatment model to address gender-based violence among women who use drugs in Kyrgyzstan: Project WINGS (Women Initiating New Goals of Safety). *Drug Alcohol Rev.* (2017) 36:125–33. doi: 10.1111/dar.12437
49. Bender K, Begun S, DePrince A, Haffejee B, Brown S, Hathaway J, et al. Mindfulness intervention with homeless youth. *J Soc Soc Work Res.* (2015) 6:491–513. doi: 10.1086/684107
50. Slesnick N, Prestopnik JL, Meyers RJ, Glassman M. Treatment outcome for street-living, homeless youth. *Addict Behav.* (2007) 32:1237–51. doi: 10.1016/j.addbeh.2006.08.010
51. Slesnick N, Kang MJ, Bonomi AE, Prestopnik JL. Six- and twelvemonth outcomes among homeless youth accessing therapy and case management services through an urban drop-in center. *Health Serv Res.* (2008) 43:211–29. doi: 10.1111/j.1475-6773.2007.00755.x
52. Zilberman ML, Blume SB. Domestic violence, alcohol and substance abuse. *Braz J Psychiatry Suppl.* (2005) 2:S51–S5. doi: 10.1590/S1516-44462005000600004
53. Gilbert L, El-Bassel N, Rajah V, Foleno A, Frye V. Linking drug-related activities with experiences of partner violence: a focus group study of women in methadone treatment. *Violence Vict.* (2001) 16:517–36.
54. Interpersonal Violence and Illicit Drugs. Liverpool: Centre for Public Health (2014).
55. Tiwari A, Leung WC, Leung TW, Humphreys J, Parker B, Ho PC. A randomised controlled trial of empowerment training for Chinese abused pregnant women in Hong Kong. *BJO.* (2005) 112:1249–56. doi: 10.1111/j.1471-0528.2005.00709.x
56. Coker AL, Smith PH, Thompson MP, Mckeown RE, Bethea L, Davis KE. Social support protects against the negative effects of partner violence on mental health. *J Wom Health Gend Base Med.* (2002) 11:465–76. doi: 10.1089/15246090260137644
57. Kozloff N, Stergiopoulos V, Adair CE, Cheung AH, Misir V, Townley G, et al. The unique needs of homeless youths with mental illness: baseline findings from a housing first trial. *Psychiatr Serv.* (2016) 67:1083–90. doi: 10.1176/appi.ps.201500461
58. Decker MR, Latimore AD, Yasutake S, Haviland M, Ahmed S, Blum RW, et al. Gender-based violence against adolescent and young adult women in low- and middle-income countries. *J Adolesc Health.* (2015) 56:188–96. doi: 10.1016/j.jadohealth.2014.09.003
59. Whitzman C. Making the Invisible Visible: Canadian Women, Homelessness, and Health Outside the "big city." (2010). Available online at: http://www.homelesshub.ca/sites/default/files/4.3%20Whitzman%20Homelessness%20Outside%20the%20Big%20City.pdf.
60. Lewis-O'Connor A, Chadwick M. Engaging the voice of patients affected by gender-based violence: informing practice and policy. *J Forensic Nurs.* (2015) 11:240–9. doi: 10.1097/JFN.0000000000000090
61. Vitopoulos N, Kielburger LC, Frederick TJ, Kidd S. Developing a trauma-informed mental health group intervention for youth transitioning out of homelessness. In: Kidd S. Slesnick N, Frederick T, Karabanow J, Gaetz S, editors. *Mental Health and Addiction Interventions for Youth Experiencing Homelessness: Practical Strategies for Front-Line Providers*. Toronto, ON: Canadian Observatory on Homelessness Press (2018). p. 149-167.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Public Health

ORIGINAL RESEARCH
published: 11 December 2020
doi: 10.3389/fpubh.2020.591369

Integrating Mental Health and Psychosocial Support Into Health Facilities in Conflict Settings: A Retrospective Review From Six African Countries

Ida Andersen[1,2]*, *Rodolfo Rossi*[1], *Mamie Nouria Meniko Yabutu*[1] and *Ives Hubloue*[2]

[1] Health Unit, International Committee of the Red Cross, Geneva, Switzerland, [2] Research Group on Emergency and Disaster Medicine, Vrije Universiteit Brussel, Brussels, Belgium

Introduction: The International Committee of the Red Cross runs an increasing number of mental health and psychosocial programmes integrated into health facilities in conflict settings across Africa. This study looks at changes in symptoms of psychological distress and impaired functioning among patients supported through such programmes.

Material and Methods: Between January and December 2019, 5,527 victims of violence received mental health and psychosocial support in 29 health facilities in Burundi, Central African Republic, Democratic Republic of the Congo, Mali, Nigeria and South Sudan. Symptoms of psychological distress (IES-R or DASS21) and daily functioning (ICRC scale) were assessed before and after the intervention. Logistical regression models were used to measure associations between these symptoms and the other variables.

Results: Factors associated with high distress prior to receiving support included age (peaking at 45–54 years), intervening within three months, rape, caretaker neglect, internal displacement, secondary education level and referral pathway. Anxiety levels in particular were higher among victims of violence committed by unknown civilians, the military or armed groups. Low functioning was associated with divorce, grief and violence committed by the military or armed groups. Following the intervention, the vast majority of patients reported reduced psychological distress (97.25% for IES-R and 99.11% for DASS21) and improved daily functioning (93.58%). A linear trend was found between number of individual sessions and reduction in symptoms of distress. Financial losses were associated with less reduction in symptoms of depression and stress.

Discussion: To further address the mental health and psychosocial needs of victims of violence, intervening quickly and increasing the number of individual sessions per patient is crucial. This requires proximity—being in the right place at the right time—which is challenging when working in stable health structures. Symptoms of depression should not be overlooked, and financial losses must be addressed in order to holistically meet the needs of victims of violence.

Keywords: mental health and psychosocial support (MHPSS), sexual violence, Africa, primary healthcare (PHC), International Committee of the Red Cross (ICRC), armed conflict, lay counselors

OPEN ACCESS

Edited by:
Jutta Lindert, University of Applied Sciences Emden Leer, Germany

Reviewed by:
Mohit Varshney, The Institute of Liver and Biliary Sciences (ILBS), India
Nancy Glass, Johns Hopkins University, United States

***Correspondence:**
Ida Andersen
iandersen@icrc.org

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Public Health

Received: *04 August 2020*
Accepted: *17 November 2020*
Published: *11 December 2020*

Citation:
Andersen I, Rossi R, Yabutu MNM and Hubloue I (2020) Integrating Mental Health and Psychosocial Support Into Health Facilities in Conflict Settings: A Retrospective Review From Six African Countries. Front. Public Health 8:591369. doi: 10.3389/fpubh.2020.591369

INTRODUCTION

Mental health and psychosocial support (MHPSS) is increasingly recognized as an integral part of humanitarian assistance offered to conflict-affected populations. MHPSS in conflict settings is also a rapidly growing area of research as scholars and practitioners seek to identify predictors of psychological distress and evidence-based approaches to treatment.

With regards to predictors of distress, a systematic review identified *age* as an important factor for prevalence of post-traumatic stress disorder (PTSD), with a sharp incline in childhood years—peaking at around 25 years—and a decline after 55 years of age (1). A cross-sectional study of patients in a hospital run by Doctors Without Borders (MSF) in Central African Republic (CAR), found high prevalence rates of PTSD (33%), acute stress (17%), insomnia (63%), anxiety (45%), and depression (41%), and identified *rape, female gender* and *high anxiety* and *depression* as the main predictors of stress (2). A study of East-African conflict survivors found that stigmatization was associated with risk of PTSD and diminished likelihood of spontaneous remission (3).

In terms of efficacy of MHPSS interventions in humanitarian settings, a Cochrane study found substantial evidence for reduction in symptoms of Posttraumatic Stress Disorder (PTSD) and depression in adults, while moderate evidence was found for reduction of anxiety in adults (4). Also, a recent umbrella review found a relatively large amount of evidence pointing to the benefit of psychosocial interventions on various mental health outcomes in low and middle-income countries, at the same time pointing to the need for more research to enhance the evidence base (5).

The MHPSS programs run by the International Committee of the Red Cross (ICRC) target a range of populations affected by armed conflict and other situations of violence (6). Programs are located in areas where the civilian population can safely access services addressing MHPSS needs deriving from ongoing fighting or political tension.

The main type of program targets victims of violence, including sexual violence, and is implemented either in health facilities in collaboration with the Ministry of Health or at community level through, for example, the National Red Cross/Red Crescent Society. Broadly speaking, activities fall within three categories: capacity-building carried out mainly by the ICRC team of expatriate and resident psychologists, awareness-raising and direct service provision carried out most often by local partners trained and supervised by ICRC MHPSS teams.

Compared to MHPSS programs at community level, integrating local health-care facilities presents certain advantages in terms of *proximity to medical care*, *discretion* and greater potential for *local ownership and sustainability* insofar as efforts are made to ensure gradual recognition by the Ministry of Health of the role of the counselor in the concerned health facilities. On the other hand, disadvantages may include *less influence* on the selection and working conditions of the counselors and on the types of patients referred to her/him and *less proximity* to direct victims of armed conflict as health facilities are permanent structures whereas community-level activities offer more flexibility in terms of following the movements of armed conflict. In recent years, standardized monitoring has become an integral part of ICRC MHPSS programs in conflict-affected areas around the world. This is the first review of ICRC MHPSS programmes in health facilities across Africa.

Abbreviations: CAR, Central African Republic; DASS21, Depression Anxiety and Stress Scale (21 items); DRC, Democratic Republic of the Congo; IDP, Internally displaced persons; IES-R, Impact of Events Scale – Revised; ICRC, International Committee of the Red Cross; MHPSS, Mental health and psychosocial support; PHC, Primary health care.

MATERIALS AND METHODS

Study Design

This is a non-controlled review of 5,527 victims of violence who received MHPSS in 29 health facilities across Burundi, the CAR, the DRC, Mali, Nigeria and South Sudan between January and December 2019.

Participant Selection

In 2019, the ICRC supported 248 primary healthcare facilities (PHC) and 123 hospitals in conflict settings across Africa. Among these, ICRC-supported MHPSS services were available in 25 PHCs and four hospitals, namely: eight PHCs in Burundi, one hospital and three PHCs in CAR, eight PHCs in DRC, two hospitals and four PHCs in Mali, one PHC in Nigeria as well as one hospital and one PHC in South Sudan. The services were offered to both adults and children seeking support (i.e., there were no exclusion criteria) and all available MHPSS data regarding the patients were included in this study.

The MHPSS Intervention

The ICRC MHPSS victims of violence programmes in health-care facilities are carried out in three phases:

Pre-assessment

At the time of enrolment, a local counselor working inside an ICRC-supported health facility assesses levels of psychological distress and functioning using standardized psychometric tools (see section Sources of Data). These monitoring tools have been chosen by our senior MHPSS specialists on the basis of literature reviews and practical field experience as the best fit for the target beneficiaries. Given that most first-line counselors have little formal training in clinical psychology, scales based on *self-reporting* by patients as opposed to clinical judgement were an important requirement for the selection.

Individual Sessions

Following the pre-assessment, a psychological treatment plan is defined based on the most pressing needs and symptoms, and individual sessions are offered on a weekly basis. Although variations exist from context to context, counselors generally follow a six-step methodology (7) consisting of:

1) Identifying the most pressing problem
2) Brainstorming for solutions to the most pressing problem

3) Exploring pros and cons of each possible solution
4) Choosing the most promising solution given the available resources
5) Planning the implementation of the solution by the patient
6) Evaluation of the implementation and repetition of steps as needed.

The ICRC MHPSS team in the country provides regular training sessions and case supervision, along with referrals to local service providers according to needs and availability.

Post-assessment

At the end of the treatment, a closing session takes place during which levels of psychological distress and functioning are reassessed using the same tools as the pre-assessment.

Sources of Data

The data used in this study comes from the ICRC MHPSS Excel database "Pearl" containing patient demographics (ten variables), trauma history (nine variables), the type of support received (five variables) as well as pre- and post-assessment scores on psychological distress and daily functioning. The Pearl was developed by senior ICRC MHPSS psychologists and psychiatrists and the variables and scales were selected to give field counselors the necessary information to develop a tailor-made treatment plan for each patient.

Psychological Distress

There are currently two self-reported measures of psychological distress which the MHPSS field teams are free to choose from: The Impact of Events Scale Revised (IES-R) and the Depression, Anxiety and Stress Scale with 21 items (DASS21). Both the IES-R and the DASS21 are suitable for use across different cultural settings (8–11). While the former measures symptoms of PTSD and is particularly relevant to patients who have *recently* been exposed to a *particular* violent event, the latter may be more adapted to patients who have undergone *multiple* experiences of violence and/or present more *long-term* and chronic reactions. In 2019, for MHPSS programs in health facilities in Africa, the IES-R was used in Burundi, CAR, Mali and Nigeria (3,013 patients), whereas the DASS21 was used in the DRC and South Sudan (2,514 patients).

The IES-R scale contains an Intrusion (eight items), an Avoidance (eight items) and a Hyperarousal (six items) subscales that are rated from zero to four and generate total scores ranging from zero to 88. Four severity categories of the total score have been proposed (12), with 39 being the cut-off score for the highest-severity category. As the pre-scores of many ICRC MHPSS patients are higher than 39, a fifth IES-R severity category was added in this study. It categorizes IES-R total scores ranging from 64 to 88 as "extremely severe" (**Table 1**). The DASS21 contains three subscales for Depression, Anxiety and Stress. Each subscale contains seven items, which can be scored from zero to two, leading to a total score ranging from zero to 42. Formal cut-off scores have been defined (13) for categorizing scores on each subscale as normal, mild, moderate, severe or extremely severe.

Functioning

The ICRC has developed an Africa-specific functionality scale using the free listing method (14) (**Table 2**). The scale differentiates between women, men and children and contains seven items scored as 0 (not capable), 1 (capable, but with more difficulty than before the violent event) or 2 (capable). Total scores range from zero to 14 and were categorized in this study as normal, mild, moderate, severe or extremely severe. In 2019, for MHPSS programs in health facilities in Africa, the ICRC functionality scale was used in Burundi, the CAR, the DRC and Mali. In Nigeria and South Sudan levels of functionality were unfortunately not recorded.

TABLE 1 | Categorization of DASS21, IES-R and functioning scores used in this study.

	IES-R total	DASS21 Depression	DASS21 Anxiety	DASS 21 Stress	ICRC Functioning
Normal	0–23	0–9	0–7	0–14	0–2
Mild	24–32	10–13	8–9	15–18	3–5
Moderate	33–38	14–20	10–14	19–25	6–8
Severe	39–63	21–27	15–19	26–33	9–11
Extremely severe	64–88	29+	20+	34+	12–14

TABLE 2 | ICRC functionality scale for Africa.

ICRC Functionality Scale for Africa– 14 items
The *woman* is:
Able to work (go to the field, to the market…)
Able to take care of her children
Able to take care of her house
Able to take care of herself (hygiene…)
Able to sleep
Able to interact with others (relationship with others, intimacy…)
Able to take part in social activities (church/mosque, ceremonies, women's group, choir…)
The *man* is:
Able to work
Able to sleep
Able to interact with others (relations with others, sexual relations…)
Able to take part in social activities (church/mosque, ceremonies, friends…)
Able to provide the needs of the family
Able to take care of himself (hygiene…)
Able to leave the house
The *child* is
Able to speak
Able to play
Able to walk
Able to interact with others
Able to eat
Able to sleep
Able to go and to work at school

TABLE 3 | Characteristics of the study population.

	n	%
Country (*N* = 5,527)		
Burundi	2,201	39.82
Central African Republic	609	11.02
Democratic Republic of the Congo	2,194	39.7
Mali	121	2.19
Nigeria	82	1.48
South Sudan	320	5.79
Gender (*N* = 5,512)		
Male	1,034	18.76
Female	4,478	81.24
Age (*N* = 3,785)		
2–17	434	11.47
18–24	823	21.74
25–34	1,350	35.67
35–44	705	18.63
45–81	473	12.5
Education level (*N* = 5,427)		
Illiterate	1,624	29.92
Basic	2,437	44.91
Medium	1,281	23.6
High	84	1.57
Current occupation (*N* = 5,004)		
Unemployed	1,410	28.18
Student	559	11.17
Farming	1,902	38.01
Other job	1,133	22.64
Civil status (*N* = 5.407)		
Single (incl. children)	1,433	26.5
Married	2,844	52.6
Partner abroad	18	0.33
Partner missing	12	0.22
Divorced/Separated	646	11.95
Widow/er	447	8.27
Other	7	0.13
Number of children (*N* = 4,094)		
0	540	13.19
1	494	12.07
2	547	13.36
3	599	14.63
4	557	13.61
5	421	10.28
6	377	9.21
7–20	559	13.65
Status (*N* = 5,474)		
Resident	4,298	78.52
Migrant	1,165	21.28
Other	11	0.2
Main types of violence highlighted by the patient during the first consultation		
Physical violence (*N* = 5.139)	2,672	52.01
Witness to physical violence (*N* = 4.972)	766	15.41
Rape (*N* = 5.122)	1,156	22.57
Attempted rape (*N* = 4,934)	101	2.05
Incest (*N* = 4.911)	18	0.37
Forced marriage (*N* = 4.911)	47	0.96
Forced prostitution(*N* = 4.909)	15	0.31
Trafficking/Smuggling (*N* = 4.908)	13	0.26
Kidnapping incl. sexual violence (*N* = 4.908)	79	1.61
Kidnapping excl. sexual violence (*N* = 4.913)	27	0.55
Killing of family member/Loved one (*N* = 4.930)	384	7.79
Disappearance of family member (*N* = 4.908)	243	4.95
Forced recruitment by armed group (*N* = 4.908)	26	0.53
Torture (*N* = 4.904)	327	6.62
Insults/Threats (*N* = 5.041)	697	11.83
Other factors of vulnerability highlighted by the patient during the first session (*N* = 5.527)		
Destroyed/Lost property and/or income	1,590	28.77
Mother head of household	501	9.06
Natural death of loved one <2 years ago	552	9.99
Natural death of loved one more than 2 years ago	481	8.7
Missing a relative	140	2.53
Caretaker neglect (for minors only)	255	4.61
Severe or chronic medical/Physical condition	328	5.93
Severe or chronic mental health condition	79	1.43
Highly stigmatized disease(s)	97	1.76
Congenital abnormality	32	0.58
Experience of discrimination/Stigma/Marginalization	400	7.24
Lack of social support/Network	1,175	21.26
Past incarceration without solitary confinement	28	0.51
Past incarceration with solitary confinement	26	0.47
Forced to flee	591	10.69
Accidents	223	4.03
Other	295	5.34
Place of violence (*N* = 4.767)		
Home	2,847	59.72
School/Work	356	7.47
On the road/While going somewhere	682	14.31
During combat	592	12.42
While fleeing violence/On the move	144	3.02
IDP/Refugee camp	12	0.25
Other	133	2.79
History of psychiatric problems (*N* = 2,879)		
No	2,766	96.08
Past only	28	0.97
Present only	63	2.19
Past and present	22	0.76
Days between latest violence and first consultation (*N* = 2,505)		
0–2	804	32.1
3–14	427	17.05
15–90	415	16.57
91–365	411	16.41
<365	448	17.88
Type of perpetrators (*N* = 4,658)		
Partner	1,197	25.5
Family member	558	11.88
Known civilian (non-family)	757	16.12
Unknow civilian	403	8.58
Military/Armed group	1,679	35.76
Other	64	1.36
Number of perpetrators (*N* = 4,508)		
One	2,596	57.59
Several	1,912	42.41

(Continued)

Data Management and Statistical Analysis

All categorical data were numerically coded. Quantitative/continuous variables (i.e., pre- and post- scores) were either kept as such or categorized depending on the type of analysis. Categorization of continuous variables was done either by identifying the median to divide the study participants in two even-sized groups or by using established clinical cut-offs (see section Sources of Data).

The dataset was created in Microsoft Excel with two independent data clerks to control for potential typing mistakes. The electronic dataset was protected by a password, which was changed every three months. The dataset was transferred to STATA™, version MP 16.0 for analysis.

All quantitative variables were explored by defining their means (and standard deviation), medians and quartiles. Comparisons of means were tested through the t-test, and the corresponding *p*-value was reported; 95% confidence intervals (95% CI) were calculated around means and means differences. Categorical variables were explored through percentages and tested using the Chi^2 test to retrieve the corresponding *p*-value; 95% CIs were calculated around these percentages.

To measure associations between variables (crude and multivariable), logistic regression models were fitted to calculate odds ratios (OR) with corresponding 95% CIs and *p*-values from the Wald test. All variables were initially explored in a crude model and their results were only presented if they were found statistically significant.

RESULTS

The Study Population

The study population (**Table 3**) included 5,527 victims of violence in Burundi (40%), the DRC (40%) the CAR (11%), South Sudan (6%), Mali (2%), and Nigeria (1%). The vast majority were female (81%) and residents (79%) as opposed to displaced. There was a diversity of age, educational background, current occupation, civil status and number of children. Around one-third of the patients consulted an MHPSS practitioner within 48 h following exposure to violence, one-third between two and 90 days and one-third beyond 90 days.

The main types of violence highlighted by the patient during the first session were quite diverse in nature, spanning from physical violence (52%) through witnessing physical violence (15%), rape (23%), insults/threats (12%), killing of a family member (8%), torture (7%), disappearance of a family member (5%) and other types of violence. Factors of vulnerability mentioned by the patient during the first session included destroyed property and/or loss of income (29%), lack of social support (21%), having been forced to flee (11%), having lost a loved one <2 years ago (10%) or more than 2 years ago (9%), being a female head of household (9%), experiencing marginalization (8%), among others. Less than five percent reported past and/or present psychiatric difficulties.

Most of the violent events had taken place in the patients' homes (60%), followed by the road (15%) or on a battlefield (13%). The alleged perpetrator was most often a member of the military or an armed group (35%), the patient's partner (26%), an unknown civilian (16%) or a family member (12%). Aggression by a single perpetrator (58%) was only slightly more common than aggression by several perpetrators (42%).

Factors Associated With High Distress Prior to Receiving MHPSS

The majority of the patients reported extreme or severe levels of distress at the time of enrolment (pre-test), regardless of whether the DASS21 or the IES-R scale was used (**Figure 1**). About a third of the patients also reported extreme or severe difficulties

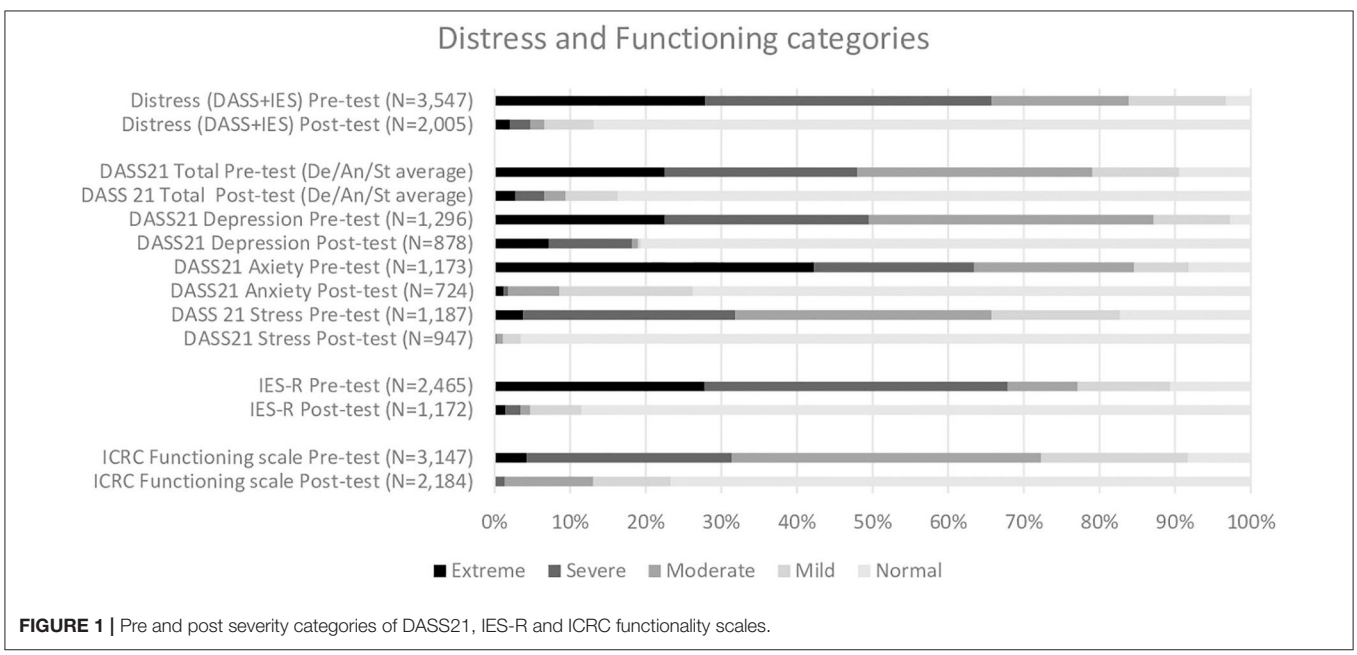

FIGURE 1 | Pre and post severity categories of DASS21, IES-R and ICRC functionality scales.

in daily functioning at the time of enrolment. See **Appendix** for full details on distress and functioning scores (**Appendix I**) and categories (**Appendix II**).

Several factors were associated with high levels of distress (cut-off defined by the median) at the time of enrollment (**Table 4**). Higher age was associated with increased odds of reporting high distress scores, with a peak between 45–55 years of age (aOR 3.60, $p \leq 0.0001$). Medium education level was associated with increased odds (aOR 1.93, $p \leq 0.0001$), as was occupations such as farming (aOR 2.85, $p \leq 0.0001$) and other jobs (aOR 3.10, $p < 0.001$). Internally displaced patients had higher odds (aOR 2.63, $p = 0.001$) than residents, and both rape (aOR 2.23 $p \leq 0.0001$) and caretaker neglect (aOR 2.14 $p = 0.003$) were also significantly associated with increased likelihood of presenting high distress scores at enrollment. Compared to patients who initiated MHPSS within 48 h following exposure to violence, patients who arrived between 91 and 365 days after were less likely to present high distress scores (aOR 0.52, $p \leq 0.0001$) as were patients who arrived more than a year later (aOR 0.55, $p \leq 0.0001$). The referral pathway mattered in that patients referred following a sensitization session in the community were more likely than self-referred patients to present high distress scores (aOR 1.47, $p = 0.031$), whereas patients referred following an information session inside the health facility were less likely (aOR 0.35, $p = 0.013$).

Looking specifically at the IES-R (**Table 5**), factors associated with high scores at the time of enrollment were similar to those of overall distress when it came to age peaking between 45 and

TABLE 4 | Factors associated with high distress at baseline (*p*-value from Wald test, aOR adjusted by the other variables in the table and country).

Variables	cOR (95%CI)	*p*-value	aOR (95%CI)	*p*-value
Age (*N* = 3,009)				
2–17	Ref	–	Ref	–
18–24	1.50 (1.15; 1.96)	0.002	1.65 (1.05; 2.61)	0.031
25–34	1.77 (1.38; 2.27)	<0.0001	2.21 (1.38; 3.54)	0.001
35–44	1.78 (1.35; 2.339)	<0.0001	2.73 (1.64; 4.55)	<0.0001
45–54	2.03 (1.44; 2.86)	<0.0001	3.60 (1.98; 6.55)	<0.0001
55–81	1.40 (0.96; 2.04)	0.078	2.45 (1.21; 4.59)	0.005
Education level (*N* = 3,297)				
Illiterate	Ref	–	Ref	–
Primary	1.43 (1.23; 1.66)	<0.0001	1.18 (0.92; 1.51)	0.186
Secondary	2.28 (1.85; 2.79)	<0.0001	1.93 (1.37; 2.72)	<0.0001
Higher	1.42 (0.81; 2.50)	0.226	0.87 (0.40; 1.91)	0.737
Current occupation (*N* = 3,051)				
Unemployed	Ref	–	Ref	–
Student	0.61 (0.46; 0.80)	<0.0001	1.46 (0.86; 2.49)	0.166
Farming	1.15 (0.97; 1.36)	0.097	2.85 (2.17; 3.74)	<0.0001
Other jobs	1.02 (0.83; 1.25)	0.075	3.10 (2.09; 4.59)	<0.0001
Status (*N* = 3,311)				
Resident	Ref	–	Ref	–
Internally displaced	0.57 (0.46; 0.69)	<0.0001	2.63 (1.47; 4.72)	0.001
Rape (*N* = 2,940)				
No	Ref	–	Ref	–
Yes	1.35 (1.11; 1.59)	<0.0001	2.23 (1.65; 3.02)	<0.0001
Caretaker neglect (*N* = 2,731)				
No	Ref	–	Ref	–
Yes	1.38 (0.99; 1.91)	0.054	2.14 (1.29; 3.54)	0.003
Days between latest violence and first consultation (*N* = 2,505)				
0–2	Ref	–	Ref	–
3–14	1.08 (0.84; 1.3)	0.056	0.81 (0.57; 1.15)	0.244
16–90	1.19 (0.93; 1.54)	0.166	0.83 (0.60; 1.15)	0.244
91–365	0.69 (0.53; 0.88)	0.004	0.52 (0.38; 0.73)	<0.0001
<365	0.63 (0.49; 0.82)	<0.0001	0.55 (0.40; 0.77)	<0.0001
Referred by (3,314)				
Self	Ref	–	Ref	–
Sensitization session (in the community)	0.48 (0.25; 0.90)	0.022	1.47 (1.04; 2.08)	0.031
Information session (in the health facility)	0.48 (0.33; 0.69)	<0.0001	0.35 (0.15; 0.80)	0.013

54 years of age (aOR 5.88 $p \leq 0.0001$), education peaking at secondary level (aOR 1.55, $p \leq 0.0001$) and caretaker neglect (aOR 2.82, $p = 0.001$). In addition, having a missing relative stood out as a strong predictor of high IES-R pre-scores (aoR 4.95, $p = 0.001$) along with destroyed or lost property or income (aOR 2.15, $p \leq 0.0001$). A linear trend was observed with regard to number of days since exposure to violence whereby more recent exposure was associated with higher odds of presenting high IES-R pre-scores. As for the referral pathway, high IES-R pre-scores were negatively associated with both referral from sensitization sessions (aOR 0.29, $p = 0.008$) and from the health facility itself (aOR 0.50, $p = 0.005$).

With regards to the likelihood of reporting high DASS21 scores at the time of enrollment (**Table 6**), a positive association was found between high depression scores and secondary education level (aOR 2.41, $p = 0.003$). A negative association was found with a duration of 91–365 days between exposure to latest violence and first MHPSS session (aOR 0.51, $p = 0.027$).

High DASS21 anxiety at enrollment odds were more than seven times more likely in patients who were divorced or separated (aOR 7.22, $p = 0.043$) than single patients, and more than four times higher in patients who had experienced rape (aOR 4.43, $p \leq 0.001$) compared to those who did not report having experienced this type of violence. The types of perpetrators most strongly associated with high DASS21 anxiety at enrollment were unknown civilians (aOR 6.33, $p \leq 0.0001$), military or armed group (aOR 3.31, $p = 0.002$) and other/not disclosed perpetrators (aOR 8.40, $p = 0.015$). Finally, compared to patients consulting within 48 h following exposure to violence, patients consulting 3–14 days after were less than half as likely to present high DASS21 anxiety symptoms (aOR 0.46, $p = 0.025$) and patients consulting more than 1 year after were five times less likely (aOR 0.18, $p = 0.003$) to do so.

The strongest predictor of high DASS21 *stress* odds at enrollment was the presence of *psychiatric problems*, which made patients almost six times more likely. Patients reporting high levels of stress at the time of enrollment were also characterized by a *higher level of education*, with patients having finished secondary school being five times more likely than illiterate patients to report high stress scores at the time of enrollment. *Married* patients were five times more likely than singles to show high levels of stress at the time of enrollment, even when controlling for other factors such as age and the type of perpetrator, i.e., the patient's partner, which would indicate domestic violence. Internally displaced people appeared three times less likely than residents to report high levels of stress at the time of enrollment.

TABLE 5 | Factors associated with high scores on IES-R at baseline (*p*-value from Wald test, aOR adjusted by the other variables in the table and country).

Variables	cOR (95%CI)	*p*-value	aOR (95%CI)	*p*-value
Age (*N* = 2,425)				
2–17	Ref	–	Ref	–
18–24	2.10 (1.55; 2.84)	<0.0001	2.85 (1.76; 4.63)	<0.0001
25–34	2.28 (1.71; 3.04)	<0.0001	3.20 (1.99; 5.14)	<0.0001
35–44	2.22 (1.62; 3.05)	<0.0001	3.97 (2.37; 6.66)	<0.0001
45–54	2.47 (1.67; 3.05)	<0.0001	5.88 (3.14; 11.01)	<0.0001
55–81	2 (0.31; 3.05)	0.002	3.98 (2.06; 7.71)	<0.0001
Education (*N* = 2,452)				
Illiterate	Ref	–	Ref	–
Primary	1.21 (1.01; 1.44)	0.03	1.36 (1.04; 1.77)	0.025
Secondary	1.86 (1.44; 2.39)	<0.0001	1.55 (1.06; 2.25)	0.023
Higher	1.22 (0.66; 2.25)	0.524	1.12 (0.51; 2.47)	0.77
Other vulnerability factors (Ref = not mentioned by the patient)				
Destroyed/lost property or income (*N* = 1,173)	1.03 (0.83; 1.30)	0.773	2.15 (1.54; 3.01)	<0.0001
Missing a relative (*N* = 1,868)	2.43 (1.25; 4.72)	0.009	4.95 (1.96; 12.49)	0.001
Caretaker neglect (for minors only) (*N* = 1,870)	2.13 (1.44; 3.16)	<0.0001	2.82 (1.672; 4.74)	<0.0001
Number of days between exposure to latest violence and first consultation (*N* = 1,810)				
0–2	Ref	–	Ref	–
3–14	1.01 (0.76; 1.34)	0.937	0.68 (0.46; 1.01)	0.053
15–90	1.17 (0.87; 1.55)	0..290	0.66 (0.46; 0.95)	0.023
91–365	0.68 (0.51; 0.91)	0.011	0.36 (0.25; 0.52)	<0.0001
365+	0.78 (0.59; 1.02)	0.067	0.34 (0.24; 0.48)	<0.0001
Referred by (*N* = 2,455)				
Self	Ref	–	Ref	–
Information sessions (in the health facility)	0.33 (0.16; 0.67)	0.002	0.29 (0.12; 0.76)	0.008
Local health structure	0.78 (0.55; 1.11)	0.166	0.50 (0.31; 0.81)	0.005

TABLE 6 | Factors associated with high scores on the DASS21 subscales at baseline (*p*-value from Wald test, aOR adjusted by the other variables in the table and country).

	cOR (95%CI)	*p*-value	aOR (95%CI)	*p*-value
DEPRESSION				
Education (1,270)				
Illiterate	Ref	–	Ref	–
Primary	2.04 (1.56; 2.67)	<0.0001	1.33 (0.79; 2.25)	0.283
Secondary	3.44 (2.53; 4.69)	<0.0001	2.41 (1.34; 4.34)	0.003
Higher	1.79 (0.72; 4.48)	0.211	1	
Number of days between exposure to latest violence and first consultation (*N* = 482)				
0–2	Ref	–	Ref	–
3–14	0.93 (0.51; 1.69)	0.811	1.00 (0.54; 1.86)	0.983
15–90	1.04 (0.56; 1.94)	0.893	1.12 (0.59; 2.12)	0.723
91–365	0.52 (0.29; 0.93)	0.028	0.51 (0.28; 0.93)	0.027
<365	0.84 (0.33; 2.15)	0.716	0.88 (0.34; 2.30)	0.791
ANXIETY				
Civil status (*N* = 1,173)				
Single	Ref	–	Ref	–
Divorced/Separated	0.52 (0.29; 0.95)	0.032	7.22 (1.06; 48.96)	0.043
Rape (*N* = 1,173)				
No	Ref	–	Ref	–
Yes	7.18 (4.89; 10.54)	<0.0001	4.43 (2.44; 8.03)	<0.0001
Other vulnerability factors (*N* = 1,173) (Ref = Not experienced)				
Destroyed or lost property or income	1.45 (1.14; 1.84)	0.002	1.87 (1.11; 3.16)	0.019
Lack of social support/network	0.57 (0.41; 0.81)	0.001	2.58 (1.42; 4.71)	0.002
Perpetrator (*N* = 739)				
Partner	Ref	–	Ref	–
Family member	0.95 (0.52; 1.75)	0.877	0.45 (0.17; 1.20)	0.111
Known non-family member	3.62 (1.81; 7.24)	<0.0001	2.56 (0.94; 6.98)	0.067
Unknown civilian	4.96 (2.52; 9.74)	<0.0001	6.33 (2.30; 17.40)	<0.0001
Military/Armed group	1.70 (1.06; 2.71)	0.027	3.31 (1.56; 7.04)	0.002
Other/Not disclosed	1.89 (0.60; 5.91)	0.275	8.40 (1.51; 46.68)	0.015
Number of days between exposure to violence and first consultation (*N* = 482)				
0–2	Ref	–	Ref	–
3–14	0.53 (0.31; 0.91)	0.022	0.46 (0.23; 0.91)	0.025
15–90	0.50 (0.28; 0.87)	0.014	0.54 (0.27; 1.08)	0.08
91–365	0.44 (0.25; 0.79)	0.005	0.56 (0.27; 1.14)	0.108
<365	0.09 (0.04; 0.23)	<0.0001	0.18 (0.06; 0.55)	0.003
STRESS				
Civil status (*N* = 1,164)				
Single (incl. children)	Ref	–	Ref	–
Married	0.84 (0.63; 1.12)	0.237	2.32 (0.86; 6.25)	0.096
Divorced/Separated	0.32 (0.17; 0.59)	<0.0001	4.61 (0.05; 20.35)	0.043
Widow/er	0.41 (0.26; 0.65)	<0.0001	3.75 (0.85; 16.51)	0.081
Status (*N* = 1,177)				
Resident	Ref	–	Ref	–
Internally displaced	0.34 (0.26; 0.46)	<0.0001	0.43 (0.01; 0.26)	0.001
History of psychiatric problems (*N* = 286)				
None	Ref	–	Ref	–
Present	4.96 (1.77; 13.94)	0.002	5.93 (1.24; 28.43)	0.026

TABLE 7 | Factors associated with low functioning at baseline (*p-value from Wald test, aOR adjusted by the other variables in the table and country).

Variables	cOR (95%CI)	p-value*	aOR (95%CI)	p-value*
Civil status (N = 5,407)				
Single (incl. children)	Ref	–		
Divorced/Separated	0.94 (0.74; 1.20)	0.624	2.09 (1.49; 2.93)	<0.0001
Main types of violence highlighted by the patient during the first consultation (Ref = Not Experienced)				
Rape (N = 2,767)	1.62 (1.37; 1.90)	<0.0001	1.36 (1.06; 1.75)	0.015
Forced marriage (N = 2,559)	2.97 (1.36; 6.47)	0.006	3.59 (1.26; 10.25)	0.017
Natural death of loved one more than 2 years ago (2,598)				
No	Ref	–	Ref	–
Yes	1.29 (0.99; 1.66)	0.05	2.33 (1.70; 3.19)	<0.0001
Type of perpetrator(s) (N = 2,903)				
Partner	Ref	–	Ref	–
Family member	0.60 (0.45; 0.78)	<0.0001	1.47 (1.06; 2.06)	0.023
Known civilian (non-family)	0.71 (0.56; 0.89)	0.004	1.17 (0.85; 1.61)	0.34
Unknow civilian	0.62 (0.46; 0.84)	0.002	1.39 (0.95; 2.04)	0.094
Military/Armed group	0.24 (0.20; 0.300)	<0.0001	1.60 (1.12; 2.29)	0.01
Other/Not disclosed	1.08 (0.57; 2.05)	0.82	6.12 (1.22; 30.80)	0.028

TABLE 8 | Characteristics of the MHPSS.

Variable	n	%
Days between latest violence and first consultation (N = 2,505)		
0–2	804	32.1
3–14	427	17.05
15–90	415	16.57
91–365	411	16.41
<365	447	17.88
Number of individual sessions excluding pre- and post-assessment sessions (N = 3,694)		
0	647	17.51
1–2	1,685	45.61
3–4	1,319	35.71
5–10	43	1.16
Number of group sessions excluding pre- and post-assessment sessions (N = 42)		
1–2	24	16.11
3 or more	18	12.06
Referrals (N = 2,505)		
Other psychological (specialist)	6	0.13
Other psychosocial	8	0.17
Health	494	10.64
Economic/Livelihood	8	0.17
ICRC Protection	65	1.4
Legal support	29	0.62
Education/School	36	0.78

TABLE 9 | Factors associated with improved distress following MHPSS (*p-value from Wald test, aOR adjusted by the other variables in the table and country).

Variable	Crude OR (95%CI)	p-value*	aOR (95%CI)	p-value*
Current occupation (N = 3,051)				
Unemployed	Ref	–	Ref	–
Student	0.47 (0.32; 0.70)	<0.0001	0.47 (0.24; 0.91)	0.025
Farming	0.98 (0.76; 1.27)	0.906	0.48 (0.29; 0.78)	0.003
Other jobs	0.73 (0.05; 11.82)	0.827	1	
High distress at baseline (N = 1,769)				
No	Ref	–	Ref	–
Yes	28.03 (21.72; 36.17)	<0.0001	28.70 (20.92; 39.37)	<0.0001
Number of individual sessions (excluding enrollment and closure sessions) (N = 1,529)				
0	Ref	–	Ref	–
1–3	2.20 (1.43; 3.40)	<0.0001	2.09 (1.19; 3.69)	0.011
4–6	1.68 (1.10; 2.56)	0.016	3.49 (1.75; 6.94)	<0.0001
7 or more	2.39 (1.08; 5.29)	0.031	6.75 (2.13; 21.34)	0.001

Factors associated with low functioning prior to MHPSS support (**Table 7**) were being divorced or separated (aOR 2.09, $p \leq 0.0001$), having experienced rape (aOR 1.36, $p = 0.015$), having experienced forced marriage (aOR 3.59, $p = 0.017$) and having lost a loved one more than 2 years ago due to natural causes (aOR 2.33, $p \leq 0.0001$). Compared to violence committed by the partner (i.e., domestic violence), odds were higher if the perpetrator was a member of the military or an armed group (aOR 1.60, $p = 0.010$), another family member (aOR 1.47, $p = 0.023$) and particularly if the patient did not wish to disclose the type of perpetrator (aOR 6.12, $p = 0.028$).

Factors Associated With Improvement Following MHPSS

The factors associated with improvement following MHPSS (**Table 8**) varied greatly depending on the domain. When looking at improvement of psychological distress (**Table 9**), the most important factor was having high distress at baseline (aOR 28.70, $p \leq 0.0001$), i.e., having room for improvement. A clear linear trend was seen between likelihood of improved distress and number of sessions attended, with patients attending seven or more sessions being almost seven times more likely to improve than patients who received only pre- and post-assessments (aOR 6.75, $p = 0.001$). Both students and farmers were only half as likely to improve as unemployed patients.

Looking at improvement on the IES-R scale (**Table 10**), associated factors included having high IES-R scores at baseline (aOR 33.70, $p \leq 0.0001$), a mother heading a household (aOR 9.23, $p \leq 0.0001$), having low functioning at baseline (aOR 3.23, $p \leq 0.0001$) and lacking social support (aOR 2.77, $p = 0.007$).

TABLE 10 | Factors associated with improved IES-R total score (38 points or more) following MHPSS (*p-value from Wald test, aOR adjusted by the other variables in the table and country).

Variable	Crude OR (95%CI)	p-value*	aOR (95%CI)	p-value*
High IES-R scores at baseline (*N* = 1,094)				
No	Ref	–	Ref	–
Yes	27.85 (20.12; 38.55)	<0.0001	33.70 (17.16; 66.16)	<0.0001
Low functioning at baseline (*N* = 1,003)				
No	Ref	–	Ref	–
Yes	1.98 (1.54; 2.56)	<0.0001	3.23 (1.88; 5.55)	<0.0001
Other vulnerability factors				
Mother head of household **(*N* = 672)**	17.69 (7.61; 41.10)	<0.0001	9.23 (3.22; 26.41)	<0.0001
Lack of social support/Network **(*N* = 673)**	1.69 (1.07; 2.66)	0.024	2.77 (1.33; 5.80)	0.007

TABLE 11 | Factors associated with improvement on DASS21depression scores (14 points or more), anxiety scores (13 points or more) and stress scores (16 points or more) following MHPSS (*p-value from Wald test, aOR adjusted by the other variables in the table and country).

Variable	Crude OR (95%CI)	p-value*	aOR (95%CI)	p-value*
DEPRESSION				
High DASS depression scores at baseline (*N* = 1,134)				
No	Ref	–	Ref	–
Yes	22.59 (16.37; 31.16)	<0.0001	29.93 (18.70; 47.91)	<0.0001
Destroyed or lost property or income (*N* = 876)				
No	Ref	–	Ref	–
Yes	0.47 (0.36; 0.62)	<0.0001	0.58 (0.40; 0.85)	0.005
ANXIETY				
High DASS21 anxiety scores at baseline (*N* = 1,111)				
No	Ref	–	Ref	–
Yes	36.64 (25.83; 51.98)	<0.0001	44.56 (24.28; 81.78)	<0.0001
Number of days between exposure to latest violence and first consultation (*N* = 429)				
0–2	Ref	–	Ref	–
3–14	0.62 (0.35; 1.08)	0.093	0.82 (0.37; 1.82)	0.631
15–90	0.81 (0.46; 1.41)	0.449	1.25 (0.56; 2.81)	0.592
91–365	0.59 (0.33; 1.05)	0.073	0.72 (0.32; 1.63)	0.435
<365	0.10 (0.04; 0.29)	<0.0001	0.23 (0.06; 0.93)	0.039
STRESS				
High DASS21 stress scores at baseline (*N* = 937)				
No	Ref	–	Ref	–
Yes	23.62 (16.74; 33.34)	<0.0001	19.88 (13.78; 28.68)	<0.0001
Destroyed/Lost property/income (*N* = 937)				
Not reported	Ref	–	Ref	–
Reported	0.51 (0.39; 0.67)	<0.0001	0.60 (0.42; 0.87)	0.006

The main factor associated with improvement on the DASS21 (**Table 11**) depression subscale was high DASS21 depression scores at baseline (aOR 29.93, $p \leq 0.0001$). A negative association was found with patients having suffered destruction or loss of property or income (aOR 0.58, $p = 0.005$).

Having high DASS21 anxiety scores at baseline was by far the strongest predictor of improvement on the DASS21 anxiety subscale. In addition, patients who consulted more than a year after exposure to violence had lower odds than patients consulting within 48 h (aOR 0.23, $p = 0.039$).

When it came to improved DASS21 stress scores, patients with high scores at baseline (aOR 19.88, $p \leq 0.0001$) and patients from DRC (aOR 1.83, $p = 0.036$) had the highest odds. Having suffered destruction or loss of property or income due to violence was associated with less likelihood of improving stress scores following MHPSS (aOR 0.60, $p = 0.006$).

Factors associated with improved functioning (**Table 12**) included low functioning at enrollment (aOR 27.53, $p \leq 0.0001$) and low distress at enrollment (aOR 3.90, $p \leq 0.0001$). A clear link was observed between improved functioning and number of individual sessions, whether four to six sessions (aOR 3.12, $p = 0.003$) or seven or more sessions (aOR 11.61, $p = 0.050$). Having been a victim of trafficking was associated with less improvement (aOR 0.13, $p = 0.049$) as was having experienced discrimination (aOR 0.48, $p = 0.032$) and having been forced to flee (aOR 0.16, $p = 0.003$).

DISCUSSION

In this section we will first discuss the recurrent characteristics of the *patient,* including the exposure to violence, that predicted high distress and low functioning at baseline and/or improvement following the intervention (**Table 13**). Second, we will discuss characteristics of the *intervention* linked to improvement. Lastly, we will present a series of programme recommendations aiming at further tailoring the MHPSS intervention to the needs of victims of violence supported at primary healthcare level.

Characteristics of the Patients

Age

The finding that patients aged between 45 and 54 are the most likely to present high distress prior to receiving MHPSS matches the finding of the recent Cochrane study (1) insofar as a decline in distress levels was seen after 55 years of age. However, the peak in PTSD symptoms at 25 years of age was not found in this study. The fact that age was not associated with treatment outcome suggests that the MHPSS intervention addresses the needs of patients of all ages.

Caretaker Neglect

Minors experiencing caretaker neglect were significantly more likely than average to report high distress at baseline. Indeed, caretaker neglect should remain a red flag that calls for the counselor's immediate attention. The fact that this neglect did not correlate with lesser improvement indicates that the intervention by and large addresses the needs of the children. However, more research is needed to better understand to what extent the intervention in its current form is adapted to the needs of children in general and those experiencing caretaker neglect in particular.

TABLE 12 | Factors associated with improved functioning (<5 points) following MHPSS (*p-value from Wald test, aOR adjusted by the other variables in the table and country).

Variables	cOR (95%CI)	p-value*	aOR (95%CI)	p-value*
Trafficking (*N* = 1,724)				
No	Ref	–	Ref	–
Yes	0.68 (0.16; 2.87)	0.604	0.13 (0.02; 0.99)	0.049
Discrimination (*N* = 1,725)				
No	Ref	–	Ref	–
Yes	1.07 (0.76; 1.51)	0.709	0.48 (0.24; 0.94)	0.032
Forced to flee (*N* = 1,724)				
No	Ref	–	Ref	–
Yes	0.04 (0.02; 0.09)	<0.0001	0.16 (0.05; 0.53)	0.003
Low functioning at baseline (binary) (*N* = 2,147)				
No	Ref	–	Ref	–
Yes	7.36 (6.08; 8.90)	<0.0001	27.53 (18.26; 41.51)	<0.0001
High distress at baseline (binary) (*N* = 1,630)				
No	Ref	–	Ref	–
Yes	2.45 (2.00; 3.00)	<0.0001	3.90 (2.62; 5.79)	<0.0001
Number of individual sessions (excluding enrollment and closure sessions) (*N* = 2,015)				
0	Ref	–	Ref	–
1–3	1.49 (0.93; 2.38)	0.1	1.74 (0.92; 3.31)	0.127
4–6	3.95 (2.46; 6.34)	<0.0001	3.12 (1.48; 6.55)	0.003
7 or more	4.89 (2.04; 11.72)	<0.0001	11.61 (1.00; 135.30)	0.05

TABLE 13 | Summary of factors associated with distress and functioning scores before and after MHPSS.

	Increased odds	Reduced odds
Factors associated with high distress and low functioning prior to MHPSS		
Distress (IES-R + DASS21)	Age peaking at 45-54, Secondary level of education, Farming or other jobs, IDP, Rape, Caretaker neglect, Referred from sensitization session	<3 Months since violence, Referred from information session
IES-R	Age peaking at 45-54, Primary and secondary levels of education, Missing a relative, Caretaker neglect, Destroyed or lost property or income	Referral from information session or health structure, Number of days since violence (linear trend)
DASS21 Depression	Secondary education	91–365 days since violence
DASS21 Anxiety	Divorced or separated, Rape, Perpetrator: Unknown civilian, military or armed group, other/not disclosed	Days since exposure to violence: 3-14 days and <365 days
DASS21 Stress	Divorced or separated,	IDP
	Present psychiatric problem	
Functioning	Divorced or separated, Natural death of a loved one more than 2 years ago, Perpetrator: Military or armed group, or other/not disclosed.	
	Increased odds	**Reduced odds**
Factors associated with improvement following MHPSS		
Distress (IES-R + DASS21)	Number of individual sessions (linear trend), High distress scores at baseline	Students, Farmers
IES-R	High IES-R at baseline, Low functioning at baseline, Mother head of household, Lack of social support	
DASS21 Depression	High depression scores at baseline	Destroyed/lost property or income
DASS21 Anxiety	High anxiety scores at baseline	<365 days since violence
DASS21 Stress	High stress scores at baseline	Destroyed/lost property or income
Functioning	Low functioning at baseline, High distress at baseline, <3 Individual sessions	Trafficking, Discrimination, Forced to flee

Divorce

Both high stress and low functioning at baseline correlated with being divorced or separated. This would indicate that—independently of exposure to violence—being divorced or separated aggravates the patient's stress and functioning levels. The fact that divorced or separated patients improved as much as average suggests that the MHPSS adequately addressed their needs.

Destroyed or Lost Property or Income

This was a predictor of higher PTSD symptoms at baseline as well as less improvement in depression and stress following the intervention. This finding is consistent with previous studies that found a link between financial means and mental health (15) and suggests that while the counselor may be able to address some of the psychological consequences of destroyed or lost property or income, symptoms of depression and stress remain high if the financial consequences of the losses are not addressed.

Education Level

Secondary education was associated with higher distress in general at enrolment, particularly PTSD and depression. This finding is inconsistent with other studies that have looked at the link between educational level and psychological distress in Uganda (16) and Africa (17). We may also speculate that since well-educated people have found to be more involved in politics (18), they more easily become political targets of violence (political affiliation was not monitored) or that better educated are more easily startled by violence. On the other hand, it may also be that the somewhat complex vocabulary used in the distress scales was more easily understood by the well-educated patients. This would also explain why there was no link between education level and the functioning scale that uses more simple language as well as visual illustrations. Either way, the fact that education level did not correlate with treatment outcome indicates that the intervention is adapted to patients of all educational levels.

Missing Relative

Missing a relative stood out as a factor significantly associated with high levels of distress prior to receiving MHPSS. This link has been established in post-conflict settings (19), however, the finding that it also plays a significant role in determining levels of distress in contexts of ongoing violence was somewhat unexpected. The fact that missing a relative was not significantly linked to the outcome suggests that the MHPSS in its current form adequately addresses the needs of this sub-group of patients.

Occupation

Occupation was not significantly associated with levels of psychological distress and functioning prior to MHPSS. However, following MHPSS, psychological distress among students (11% of the study population) and farmers (38%) improved significantly less than among patients with other jobs (23%) and those unemployed (28%).

Perpetrator Profile

Violence committed by members of the military or an armed group was associated with lower functioning at baseline, underlining the debilitating consequences that violence committed by these types of perpetrators can have on the daily functioning of their victims. The fact that perpetrator profile did not correlate with treatment outcome indicates that the intervention is equally suitable for victims of violence committed by civilians and weapon bearers.

Rape

Standing out as a particularly debilitating type of violence, rape correlated significantly with high psychological distress prior to MHPSS. This result is consistent with the findings of the recent MSF CAR study (2). The fact that patients who had experienced rape improved as much as average indicates that the intervention in its current form addresses the psychological needs stemming from this type of violence.

Referral Pathway

The fact that significantly lower level of distress was reported by patients referred after an ICRC information session or by health personnel indicates a need for more clarity when it comes to explaining psychological distress and identifying patients in need of MHPSS.

Characteristics of the Intervention

Number of Individual Sessions

The number of individual sessions correlated with improvement in both distress (lower) and functioning (higher). While some therapeutic approaches such as single-session therapy (20) are designed for brief encounters, the short-term solution-oriented therapy offered to this cohort does require a series of sessions to be effective. The larger the number of sessions, the greater the likelihood of improvement. This finding indicates that despite some methodological limitations of the study, changes in levels of distress and functioning appear strongly linked to the MHPSS intervention.

Referrals

Referrals did not significantly correlate with treatment outcome. It would appear that patients who have suffered important economic losses as a result of conflict would have benefited from a referral to an economical services provider. ICRC economic security projects are usually offered after the MHPSS has ended. Psychological outcomes of such assistance are not systematically monitored, including for the cohort involved in this study.

Programme Recommendations

1) Triage: Health personnel and awareness raisers carrying out information sessions may benefit from more training on identifying patients with specific MHPSS needs to better filter the patients that they refer to the counselor. At the counselor's level, it would seem relevant to increase the filtering of patients based on the distress and functioning scales in order to identify and focus on the most vulnerable.
2) Increase number of sessions per patient: We saw a clear link between number of individual sessions and improved distress and functioning. Four sessions—excluding enrolment and closure—should be the target taken into consideration when budgeting, for example, the reimbursement of transportation costs.
3) Address depression: The current approach is well-tailored to PTSD and anxiety in general. However, for almost 20% of the patients, depression scores remain severe or extremely severe following MHPSS. There appears to be a need to increase training of counselors on therapeutic approaches with regard to depression and the effect of more long-term reactions to witnessing and/or experiencing multiple violent events.
4) Financial assistance: We found a significantly smaller improvement in anxiety and stress symptoms among patients who experienced destruction or loss of property or income. This would indicate that MHPSS alone is not sufficient and that this group of patients need further support in facing the economic consequences of violence. A more systematic inclusion of a financial component of projects for victims of violence is recommended, along with regular monitoring of MHPSS outcomes of financial support.
5) Explore the role of education: a qualitative study can be considered to better understand the tendency of patients with primary and secondary education levels to report higher levels of psychological distress prior to receiving MHPSS.

As the very first study of victims of violence benefiting from ICRC MHPSS integrated into health-care facilities across Africa, the main attributes of this study constitute the large sample size and real-life setting. However, the study also has some limitations to take into consideration. First, as there was no control group we cannot state with certainty that changes observed were in fact due to the MHPSS received. Second, the nature of the conflict setting made it very difficult for patients to access the health facilities for MHPSS follow-up sessions and 43% of the patients did not have a post-assessment. Also, in these acute circumstances clinical care was prioritized over systematic data collection, leading to missing values for different variables. Third, the use of self-reported scales could have created an information bias, however, while some patients may overstate and other patients may understate, any change in symptoms would still be measured reliably. Finally, the fact that we do not know the distress and functioning levels of the patients before exposure to violence nor in the long term following the MHPSS intervention makes it difficult to state with certainty what impact the violence had on the patients and to what extent the MHPSS was useful in the long term.

Despite these limitations, the findings of this study underline that exposure to violence in the context of armed conflict is associated with high levels of psychological distress and low functioning. Fortunately, strong associations between MHPSS intervention, reduced distress and increased daily functioning underline that this type of support adequately addresses the psychological needs of victims of violence. To further address these needs, it should be prioritized to intervene quickly, increase the number of individual sessions per patient, address symptoms of depression and tackle financial needs deriving from exposure to violence.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

IA and MY: literature search and collected the data. IA and RR: conceived and designed the analysis. IA: performed the analysis and wrote the paper. MY, IH, and RR: commented. All authors contributed to the article and approved the submitted version.

FUNDING

The data was collected routinely as part of the ICRC's monitoring of MHPSS programmes.

ACKNOWLEDGMENTS

The authors wish to thank the entire ICRC MHPSS Africa team and partners for their relentless work in assisting victims of armed conflict.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2020.591369/full#supplementary-material

REFERENCES

1. Charlson FJ, Flaxman A, Ferrari AJ, Vos T, Steel Z, Whiteford HA. Post-traumatic stress disorder and major depression in conflict-affected populations: an epidemiological model and predictor analysis. *Glob Ment Health.* (2016) 3:E4. doi: 10.1017/gmh.2015.26
2. Mpembi MN, Lukeba T, Mayemba D, Massamba VK, ma Nzuzi TM, Gokara S, et al. États de stress en consultation externe à l'hôpital général de Bangui dans un contexte de conflit armé: étude transversale descriptive. *Pan Afr Med J.* (2018) 29:1–7. doi: 10.11604/pamj.2018.29.26.7107
3. Schneider A, Conrad D, Pfeiffer A, Elbert T, Kolassa IT, Wilker S. stigmatization is associated with increased PTSD risk after traumatic stress and diminished likelihood of spontaneous remission–a study with East-African conflict survivors. *Front Psychiatry.* (2018) 9:423. doi: 10.3389/fpsyt.2018.00423
4. Purgato M, Gastaldon C, Papola D, Van Ommeren M, Barbui C, Tol WA. Psychological therapies for the treatment of mental disorders in low-and middle-income countries affected by humanitarian crises. *Cochr Database Syst Rev.* (2018) 7:CD011849. doi: 10.1002/14651858.CD011849.pub2
5. Barbui C, Purgato M, Abdulmalik J, Acarturk C, Eaton J, Gastaldon C, et al. Efficacy of psychosocial interventions for mental health outcomes in low-income and middle-income countries: an umbrella review. *Lancet Psychiatry.* (2020) 7:162–72. doi: 10.1016/S2215-0366(19)30511-5
6. ICRC. *Guidelines on Mental Health and Psychosocial Support*. Geneva: ICRC (2018).
7. ICRC. *Manuel de prise en charge des victimes de violence: Les maisons d'écoute en République Démocratique du Congo*. Geneva: ICRC (2016).
8. Weiss DS. The impact of event scale: revised. In: Wilson JP, Tang CS, editors. *Cross-Cultural Assessment of Psychological Trauma and PTSD. International and Cultural Psychology Series*. Boston, MA: Springer (2007).
9. Coker AO, Coker OO, Sanni D. Psychometric properties of the 21-item depression anxiety stress scale (DASS-21). *Afr Res Rev.* (2018) 12:135–42. doi: 10.4314/afrrev.v12i2.13
10. Oei TP, Sawang S, Goh YW, Mukhtar F. Using the depression anxiety stress scale 21 (DASS-21) across cultures. *Int J Psychol.* (2013) 48:1018–29. doi: 10.1080/00207594.2012.755535
11. Norton PJ. Depression anxiety and stress scales (DASS-21): psychometric analysis across four racial groups. *Anxiety Stress Coping.* (2007) 20:253–65. doi: 10.1080/10615800701309279
12. McCabe D. *The Impact of Events Scale – Revised (IES-R). Try This: Best Practices in Nursing Care to Older Adults*. New York University, Rory Meyers College of Nursing (2019). p. 19. Available online at: https://consultgeri.org/try-this/general-assessment/issue-19.pdf (accessed July 30, 2020).
13. Lovibond SH, Lovibond PF. Manual for the depression anxiety & stress scales. 2nd ed. Sydney: Psychology Foundation (1995).
14. Bolton P, Tang AM. An alternative approach to cross-cultural function assessment. *Soc Psychiatry Psychiatr Epidemiol.* (2002) 37:537–43. doi: 10.1007/s00127-002-0580-5
15. Sayeed S, Fernando D. Poor mental health: the relationship between poverty and mental health in lower and middle income countries. *AMSA J Glob Health.* (2018) 12:15–8.
16. Mootz JJ, Muhanguzi F, Greenfield B, Gill M, Gonzalez MB, Panko P, et al. Armed conflict, intimate partner violence, and mental distress of women in northeastern Uganda: a mixed methods study. *Psychol Women Q.* (2019) 43:457–71. doi: 10.1177/0361684319864366
17. Myer L, Stein DJ, Grimsrud A, Seedat S, Williams DR. Social determinants of psychological distress in a nationally-representative sample of South African adults. *Soc Sci Med.* (2008) 66:1828–40. doi: 10.1016/j.socscimed.2008.01.025
18. Larreguy H, Marshall J. The effect of education on civic and political engagement in nonconsolidated democracies: evidence from Nigeria. *Rev Econ Stat.* (2017) 99:387–401. doi: 10.1162/REST_a_00633
19. Andersen I, Poudyal B, Abeypala A, Uriarte C, Rossi R. Mental health and psychosocial support for families of missing persons in Sri Lanka: a retrospective cohort study. *Confl Health.* (2020) 14:1–15. doi: 10.1186/s13031-020-00266-0
20. Paul KE, van Ommeren M. A primer on single session therapy and its potential application in humanitarian situations. *Intervention.* (2013) 11:8–23. doi: 10.1097/WTF.0b013e32835f7d1a

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

METHODS
published: 19 February 2021
doi: 10.3389/fpsyt.2021.569335

A Multi-Method Approach to a Comprehensive Examination of the Psychiatric and Neurological Consequences of Intimate Partner Violence in Women: A Methodology Protocol

Tara E. Galovski[1,2], Kimberly B. Werner[3], Katherine M. Iverson[1,2], Stephanie Kaplan[3], Catherine B. Fortier[4,5], Jennifer R. Fonda[2,4], Alyssa Currao[4], David Salat[4,6] and Regina E. McGlinchey[4,5]*

[1] Women's Health Sciences Division, National Center for Posttraumatic Stress Disorder, Veterans Affairs Boston Healthcare System, Boston, MA, United States, [2] Department of Psychiatry, Boston University School of Medicine, Boston, MA, United States, [3] Women's Health Sciences Division, National Center for PTSD, VA Boston Healthcare System, Boston, MA, United States, [4] The Translational Research Center for Traumatic Brain Injury and Stress Disorders and the Geriatric Research, Education and Clinical Center, Veterans Affairs Boston Healthcare System, Boston, MA, United States, [5] Department of Psychiatry, Harvard Medical School, Cambridge, MA, United States, [6] Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Charlestown, MA, United States

OPEN ACCESS

Edited by:
Danny Horesh,
Bar-Ilan University, Israel

Reviewed by:
Odelia Elkana,
Academic College Tel Aviv-Yaffo, Israel
Tamar Silberg,
Bar-Ilan University, Israel

***Correspondence:**
Kimberly B. Werner
wernerk@umsl.edu

Specialty section:
This article was submitted to Psychopathology, a section of the journal Frontiers in Psychiatry

Received: 03 June 2020
Accepted: 21 January 2021
Published: 19 February 2021

Citation:
Galovski TE, Werner KB, Iverson KM, Kaplan S, Fortier CB, Fonda JR, Currao A, Salat D and McGlinchey RE (2021) A Multi-Method Approach to a Comprehensive Examination of the Psychiatric and Neurological Consequences of Intimate Partner Violence in Women: A Methodology Protocol. Front. Psychiatry 12:569335. doi: 10.3389/fpsyt.2021.569335

The number of women in the United States that experience blows to the head during assaults by intimate partners is substantial. The number of head blows that result in a traumatic brain injury (TBI) is virtually unknown, but estimates far exceed numbers of TBI in parallel populations (e.g., blast exposure, accidents, sports) combined. Research on the impact of TBI on post-traumatic stress disorder (PTSD) in survivors of intimate partner violence (IPV) is sparse. This methodology paper describes the comprehensive, multi-method approach used by a multi-disciplinary team of investigators from several different fields of expertise to assess the interaction of psychiatric, cognitive, psychological, and physical conditions that result from IPV. Using state-of-the-art instruments, a comprehensive assessment of lifetime trauma exposure, lifetime history of TBI, psychiatric history, and a full assessment of current cognitive, neuropsychological and biomedical function was conducted with 51 female survivors of IPV who screened positive for PTSD. This multi-method assessment included clinician-administered diagnostic interviews modified to specifically assess the sequelae of IPV, standardized self-report surveys, neuropsychological tests, structural, diffusion, and functional neuroimaging and blood-based biomarkers. The specific details and full report of the results of the full study are beyond the scope of this methodology paper. Descriptive characteristics of the complex clinical presentation observed in this unique sample are described. The sample reported high rates of trauma exposure across the lifespan and 80% met full criteria for current PTSD. Women also reported high rates of lifetime subconcussive head injury (88.2%) and TBI (52.9%) from various etiologies

(35.3% secondary to IPV). Descriptive findings from the methodological protocol described here have begun to reveal information that will advance our understanding of the impact of subconcussive head injury and TBI on recovery from mental injury among IPV survivors.

Keywords: intimate partner violence, traumatic brain injury, women, post-traumatic stress, concussion

INTRODUCTION

Intimate partner violence (IPV), defined as physical violence, sexual violence, stalking or psychological aggression by a current or former intimate partner, is a public health crisis in the United States (1, 2). Approximately 1 in 3 adult women (34%) experience physical IPV during their lifetime, with 1 in 4 women (23%) experiencing severe physical IPV such as being hit with a fist or hard object, strangled, beaten, or assaulted with a weapon (3). Although women and men both experience IPV, women are more likely than men to experience severe physical IPV and, subsequently, incur more injuries (3, 4). IPV-related injuries are often repeated over time (5, 6). Injuries to the head, neck, and face are most frequently described and, indeed, are reported by 35–94% of IPV survivors (7). Approximately 50% of IPV survivors report attempted strangulation at the hands of a partner (8), adding to the potential for damage to the brain secondary to anoxia.

While physical injury secondary to IPV is common, psychiatric consequences are substantial as well. Post-traumatic stress disorder (PTSD) is one of the most common psychiatric diagnoses secondary to exposure to the trauma of IPV (9). Women who experience physical IPV are 2.3 times more likely to have PTSD compared to those who do not experience physical violence from a partner (10). PTSD is characterized by re-experiencing a traumatic event followed by persistent avoidance of trauma-related stimuli, negative cognitions and mood, and persistent symptoms of increased arousal (11). Estimates of PTSD following IPV range from 31 to 63.8% depending on the sample composition and assessment methodology (9, 12).

The complexity of the relationship between head injury and PTSD secondary to IPV is apparent in a growing literature (13–16). In order to develop interventions to successfully promote recovery, it is imperative to understand the potential synergistic interaction of the full spectrum of relevant neurobiological, psychiatric, psychological, social, and environmental risk factors that contribute to functional, physical and mental health outcomes. The universe of moderating variables that can contribute to the observed complex clinical presentations in the IPV population is immense. Understanding how negative physical, functional, and mental health outcomes evolve over time requires a comprehensive assessment of both the physical and psychological impacts of IPV and consideration of the larger context of prior injuries and the cumulative effect of lifetime exposures to traumatic events. This methodology paper describes the comprehensive, multi-method approach used by a multi-disciplinary team of investigators from several different fields of expertise to assess the interaction of psychiatric, cognitive, psychological, and physical conditions that result from IPV.

The Complexity of Assessment of Head Injuries and PTSD in IPV

The preponderance of studies in the IPV literature to date have focused primarily on one or two physical and/or mental conditions that result from IPV or have controlled for these conditions, but have not considered them more comprehensively as primary outcomes. For example, as pointed out by Valera et al. (17), studies focusing on PTSD among female IPV survivors typically exclude or do not consider head injuries in their design. This is problematic because symptomatology that has historically been linked to post-traumatic stress secondary to IPV may be better understood by considering the interaction of head injury, unique physiological disruptions (e.g., anoxia), environmental factors, and the chronic stress characteristics of IPV (18). Contrarily, executive functioning deficits that are more characteristic of head injuries such as mild traumatic brain injury (mTBI) [e.g., (19)], including cognitive, behavioral, and emotional difficulties, may be better attributable to PTSD or other comorbid psychiatric conditions (e.g., disruptions in sleep, irritability or aggression, disinhibition, anxiety, depression) (11). Disentangling this complex clinical presentation and arriving at differential diagnoses requires a comprehensive assessment critical in informing treatment. This methodology paper describes the most comprehensive biopsychosocial assessment of the effects of IPV assaults to date.

As noted, injuries to the head, neck and face are the most common type of injury reported during IPV assaults (7) and some percentage of those injuries will result in a traumatic brain injury (TBI). TBI is defined as a physiological disruption in brain function resulting from a blow to the head (20, 21). The three primary acute symptoms of TBI are alteration in mental status (AMS), post-traumatic amnesia (PTA), and loss of consciousness (LOC). The severity of TBI is further specified as mild, moderate or severe and determined by the duration of the acute symptoms. Mild TBI (mTBI) accounts for nearly 80% of all TBIs (22). Accurate diagnosis of TBI requires careful assessment of each of these three acute symptoms with particular care to differentiate physiological and psychological responses (i.e., acute stress symptoms, dissociation, disorientation and/or confusion from the experience of a frightening or life-threatening event) that can occur during and after the injury (23). See **Figure 1** for an overview of the significant overlap between symptoms of TBI and PTSD that contributes to the diagnostic complexity of disentangling symptoms consistent with physical injury from those better attributable to mental injury.

The preponderance of research examining subconcussive head injury and TBI has focused primarily on injury secondary to falls, motor vehicle accidents, combat-related concussive blasts,

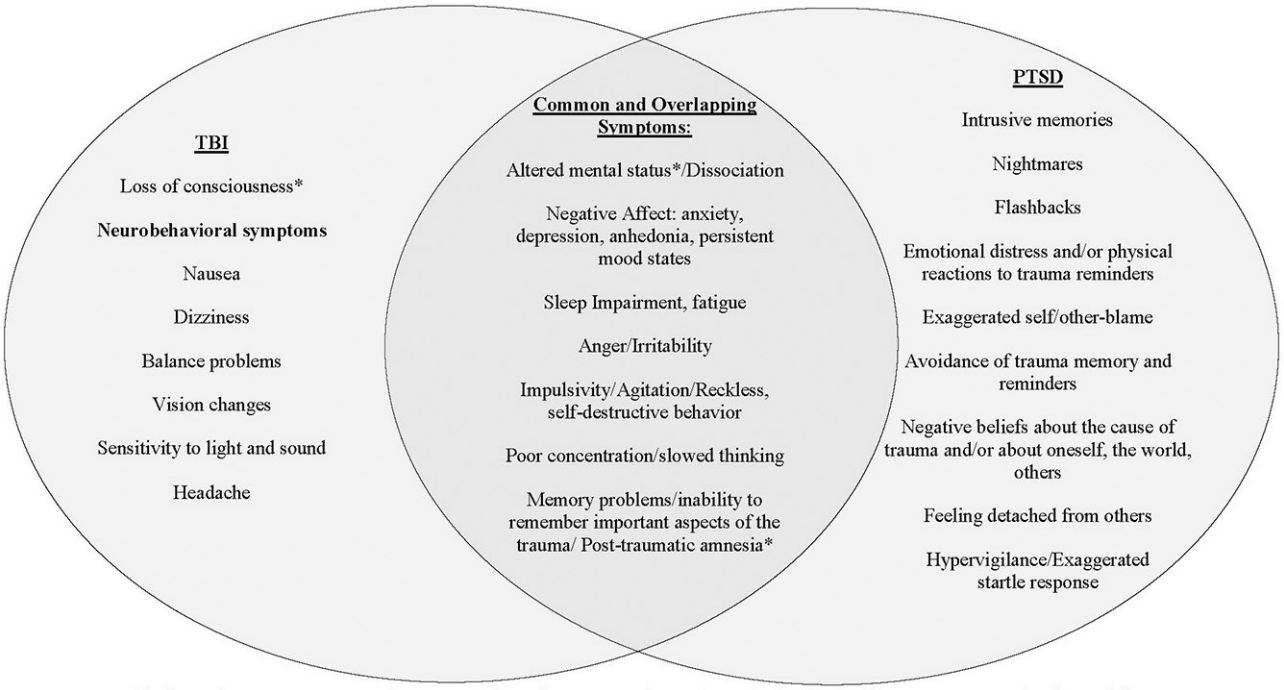

FIGURE 1 | Discrimination of symptoms associated with TBI from those associated with PTSD. This figure is meant as a general representation of constructs for each syndrome, but each symptom can arise from different underlying mechanisms whether neurologic or psychiatric. The asterisk (*) indicates diagnostic symptoms of acute TBI. Common symptoms of TBI and PTSD can be almost identical and therefore very difficult to distinguish the etiology. These symptoms require a thorough clinical evaluation to establish a temporal relationship between traumatic event, physical injury, symptom onset, and course.

and sports-related injuries (24, 25). However, estimates suggest that ∼23 million women in the US have experienced a TBI from IPV (26), numbers far exceeding estimates of TBI in military and athlete cohorts combined (17, 27). Findings from these parallel, head-injured populations are difficult to generalize to injuries sustained during IPV assaults because of the nature of the blow to the head, neck, and face and the context in which the injury occurs (16, 17). For example, the majority of head blows during IPV assaults are quite variable in nature. Blows can be either focal or diffuse, can include primary rotational blows (e.g., punches to the face and head) and/or secondary blunt force blows (e.g., being thrown into a wall or down stairs or being hit by a hard object such as a bat). Violence typically increases in frequency and severity over time (28). This escalating pattern of assault, often with little time for healing between injuries, can lead to both substantial and obvious injury as well as subconcussive head injury that can go undetected, unreported, undiagnosed, and untreated among IPV survivors (8, 29–31), [e.g., (32)]. In addition to blows to the head, strangulation is particularly unique to IPV and increases the possibility of brain injury due to anoxia. Anoxic brain injury (ABI) occurs when the brain is deprived of oxygen. This deprivation affects medial temporal and subcortical regions of the brain [e.g., basal ganglia, hippocampus, limbic structures, (33)], and, if prolonged, damage can become more diffuse. Experiencing both blows to the head and strangulation during violent intimate partner relationships is not uncommon and results in compounded risk for brain injury. In a study examining injuries among women seeking help following IPV, ∼75% of participants reported having been strangled and nearly 50% reported repeated blows to the head (34).

The assessment of head injury and diagnosis of TBI (including anoxic brain injury) in the IPV population is clearly complicated. This complexity contributes to the lack of consensus in reported prevalence of TBI, with rates ranging from 28 to 100% (6, 14, 26, 35). The considerable variability across studies is due, in part, to inconsistencies in definitions and terminology used to describe the same condition [e.g., mTBI, concussion, and head injury, (36)] and further complicated by the wide range of instruments used to assess TBI including screening items, self-report questionnaires, and clinician-administered diagnostic interviews (37). These methodological limitations in the larger TBI literature may be particularly apparent in studies with IPV samples which tend to rely on general screening items or scales to estimate TBI vs. validated screening and clinician-administered diagnostic instruments (26, 27).

Domains of Assessment and Differential Diagnoses

Diagnosing TBI

Arriving at an accurate diagnosis of TBI is an essential first step in understanding its impact on PTSD. The Boston Assessment of Traumatic Brain Injury, Lifetime (BAT-L) (23) is a validated, reliable, and comprehensive semi-structured clinical interview to characterize and diagnose mild TBI across the lifespan.

The BAT-L was selected for the current study due to its strong psychometric qualities, its ability to sensitively distinguish between subconcussive head injury and TBI, and to differentiate alterations in acute symptoms of TBI (AMS, PTA, LOC) from other common physiological and psychological reactions to injury and trauma. For the purposes of this study, the BAT-L was expanded to specifically query head blows and injuries across participants' IPV relationship(s) (38).

Lifetime and Current Trauma History

The context in which injuries associated with IPV assaults occurs also warrants specific attention in a comprehensive assessment. Assaults by intimate partners happen, by definition, in a chronically traumatizing and invalidating environment. This controlling environment is characterized by emotional abuse and betrayal, coercion, isolation, and lack of independence or ability to access resources (39, 40). The psychiatric and psychological effects of the traumatic assaults and abuse interact with the physical and neurological effects of the head injury and amplify the overall clinical presentation of IPV survivors (16). Finally, an assessment of the psychological sequelae of IPV must also consider the effects of previous trauma exposures. Prior history of abuse in both childhood and adulthood (in addition to IPV) are prevalent among women who experience IPV (41–43) and contribute to the cumulative trauma burden and current post-traumatic stress. A thorough assessment of the full history of violence within intimate partner relationships and non-IPV trauma across the lifespan is necessary to inform diagnosis and to specify treatment decisions.

Psychiatric Comorbidity

The extent to which the diffuse symptoms associated with comorbid psychiatric conditions such as PTSD, depression, anxiety, and substance use disorders; psychological difficulties such as sleep disturbances, impulsivity, aggression or irritability, dissociation; and behavioral changes such as social isolation and withdrawal overlap can contribute to the difficulties in arriving at differential diagnoses (25, 44, 45). Within the IPV literature, the range of comorbid psychiatric conditions and TBI has been documented in several studies, revealing strong associations between IPV-related TBI and PTSD, depression, anxiety, insomnia, and poorer overall perceptions of mental health (13–15, 46). A full psychiatric and psychological assessment is critical in evaluating the effects of IPV on mental health.

Neuropsychological Functioning

Further complicating assessment and treatment in this population is some evidence of possible neuropsychological impairments among women who experience IPV, but it remains unclear to what extent TBI and PTSD may contribute to or account for these problems. For example, cognitive deficits, including poorer working memory, visuoconstruction, and executive function have been observed among women with IPV, including among those with and without PTSD (47). Yet in a sample of women with PTSD secondary to IPV, Twamley et al. (48) observed that higher PTSD severity was associated with slower processing speed, and higher dissociation symptoms were associated with poorer reasoning performance. It is notable that these studies did not attend to TBI history, which is important for future research as there is some evidence that TBIs in the context of IPV are associated with impairment in neuropsychological functioning including memory deficits, difficulty in learning, and poor cognitive flexibility (6, 49). Based on research to date, it remains unclear what role PTSD and TBI (and other psychiatric/psychological factors) play in these associations. Given that the cognitive domains implicated in TBI overlap with cognitive deficits secondary to PTSD, interpretation of the results of a full neuropsychological assessment is critical in disentangling the physical and psychological contributions to the full clinical presentation (50).

Neurological Signature of TBI

Neuroimaging of markers of processes hypothesized to be implicated in impairment associated with PTSD and TBI provides additional clues about the neuropsychological and neurobiological consequences of brain injury. Alterations in neural connectivity and/or the detection of structural abnormalities can then be mapped onto performance on neuropsychological tests. In the larger TBI literature, there is evidence to suggest that the role of the TBI in poor psychiatric and psychosocial outcomes is substantial; however, most studies to date fail to determine the independent contribution of TBI(s) in the onset and propagation of these problems (51). As described, several studies suggest that psychiatric distress (PTSD and depression) and not injury–related characteristics, is uniquely associated with reported neurobehavioral symptoms following head injury [e.g., (50, 52, 53)]. On the other hand, as discussed, TBIs in the context of IPV are associated with impairment in neuropsychological functioning including memory deficits, difficulty in learning, and poor cognitive flexibility (6, 49). These cognitive impairments purportedly arise from diffuse axonal injuries in brain networks that are important for attention, memory, and executive function (54–56), suggesting that observed impairment is independently associated with the brain injury. These distinctions are important in informing interventions.

To date, only two published studies have examined the neurological signature of TBI specifically in an IPV population. Utilizing resting state functional magnetic resonance imaging and neuropsychological measures, Valera and Kucyi (56) examined IPV-related head injuries (including TBI, anoxic brain injuries, and subconcussive blows), neural connectivity, and cognitive functioning in 20 women IPV survivors. Seventy-five percent of participants had suffered IPV-related, repetitive head injuries. Severity of brain injury was associated with reduced connectivity within the salience network, the neural network positively associated with memory and learning (16, 17). This effect remained even after controlling for psychiatric distress (e.g., PTSD and depression symptoms). In a follow-up study, researchers examined micro-structural neurologic changes and cognition in the same sample with IPV-related mTBI. Overall brain injury severity scores were negatively associated with fractional anisotrophy in the posterior and superior corona radiata. However, no association was found between the cognitive

measures of learning, memory, and cognitive flexibility and fractional anisotrophy in these regions (16, 17). Although Valera and colleagues statistically controlled for PTSD symptoms, further research is needed to assess the independent and interactive effects of the brain injury and PTSD on mental and physical health outcomes and related functional impairments.

Blood-Based Biomarkers

Finally, a major gap in the literature is the consideration of biomedical data in understanding the effects of IPV. Understanding the physical health history and assessing basic health indicators including blood pressure, height, weight, body mass index, and pulse can identify risk factors as well as negative health outcomes associated with IPV. In particular, Valera et al. (17) argue that blood-based biomarkers are a critical area for IPV research. For example, the authors note that tau and amyloid beta are candidate biomarkers for this population because they have been implicated in the development of TBI-related cognitive and neurodegenerative disorders (17). There is also evidence of elevated concentrations of tau in service members and Veterans with concurrent mild TBI and PTSD (57). Furthermore, a recent review indicated that there are significant alterations in neurotransmitter, peptide, and steroid hormone levels in PTSD (58). To our knowledge, no studies have specifically examined these or other blood-based biomarkers among women IPV survivors with PTSD nor whether there are additive effects of TBI with concurrent PTSD among this population.

Current Study

The current study sought to describe the methodology used in the most comprehensive, multi-method assessment of the long-term effects IPV to date. The methodology outlined in this paper positions this unique, multi-disciplinary investigative team to accomplish the overarching goal of understanding the impact of head injuries and TBI on PTSD in an all-female sample of IPV survivors. Specifically, in future publications, we seek to characterize the relative contributions of TBI and/or subconcussive head injury to psychiatric, psychological, and functional outcomes in this population with the ultimate goal of identifying novel targets for intervention and enhancing the overall effectiveness of current, single modal treatment strategies. The results of those study aims are too broad to present in this methodology paper. Here, we describe the methodology used in this comprehensive assessment and present the clinical descriptives of the study sample, but we will not include findings from the neuroimaging, blood-based biomarkers, full range of psychiatric comorbidities, or neuropsychological assessment as those methodological details and analyses are beyond the scope of this paper.

METHODS

Participants

Women were recruited from a mid-size, midwestern metropolitan area via flyers sent to agencies that serve survivors of IPV and through advertisement on social media. Women between the ages of 18–45 years old who reported a history of IPV and screened positive for probable PTSD on the PTSD Checklist for DSM-5 [PCL-5; (59)] screener during phone intake were invited to participate in the study, as these were the study's inclusion criteria. Exclusion criteria included history of neurological illness (e.g., Huntington's, Parkinson's, dementia, Multiple sclerosis), history of seizure disorders unrelated to head injury(ies), current diagnosis of Bipolar I disorder, schizophrenia or other psychotic disorders, and current active homicidal and/or suicidal ideation with intent requiring crisis intervention. Pregnancy and metal in the body were additional exclusion criteria, as the study design included MRI. Two hundred and fourteen women were screened by phone for the study. Of these, 136 were excluded from participation during the phone screen for the following reasons: 67 were over age 45, 24 did not meet screening cutoffs for probable PTSD, 5 denied a history of IPV, 4 lived out of state, 20 had Bipolar I Disorder, 3 reported a seizure disorder, 9 were pregnant, and 4 had metal in her body. Per these criteria, 78 women screened eligible. Twenty-seven of the 78 women did not complete the study for a variety of reasons including: 2 declined to participate after phone screen, 16 did not show up for scheduled assessments, 2 presented with symptoms consistent with exclusionary diagnoses on the day of assessment (Bipolar I and psychosis respectively), 2 were found to be pregnant on the day of the assessment, 1 moved out of state prior to assessment, 1 was in a developing traumatic situation and needed to decline participation, 1 was diagnosed with Bipolar Disorder by a physician prior to assessment, and two reported medical complications that prohibited participation prior to assessment (multiple sclerosis and beginning chemotherapy, respectively). The final sample included 51 participants (see **Figure 2**).

Procedures

The study team consisted of a multidisciplinary partnership with expertise across relevant clinical and methodological domains and included investigators from the Women's Health Sciences Division of the National Center for PTSD, Translational Research Center for TBI and Stress Disorder (TRACTS), University of Missouri – St. Louis Missouri Institute of Mental Health (UMSL), and Washington University (WASHU) Center for Clinical Imaging Research. Once screened, participants signed informed consent. Clinical diagnostic interviews, neuropsychological assessment, and completion of psychological and psychosocial standardized instruments were conducted at UMSL. Biological data was collected, and imaging was conducted at WASHU. Assessments took ∼12 h over the course of 2 days; participants were offered remuneration for their time ($150 for day 1 and $125 for day 2). The study was conducted under the oversight of Institutional Review Boards at UMSL, WASHU, and the VA Boston Healthcare System.

Measures

Clinical Interviews

A master's level clinical assessor conducted the clinician-administered interviews to assess for trauma, PTSD, psychiatric comorbidity, subconcussive head injury, and TBI. Each case was reviewed by at least three doctoral-level psychologists

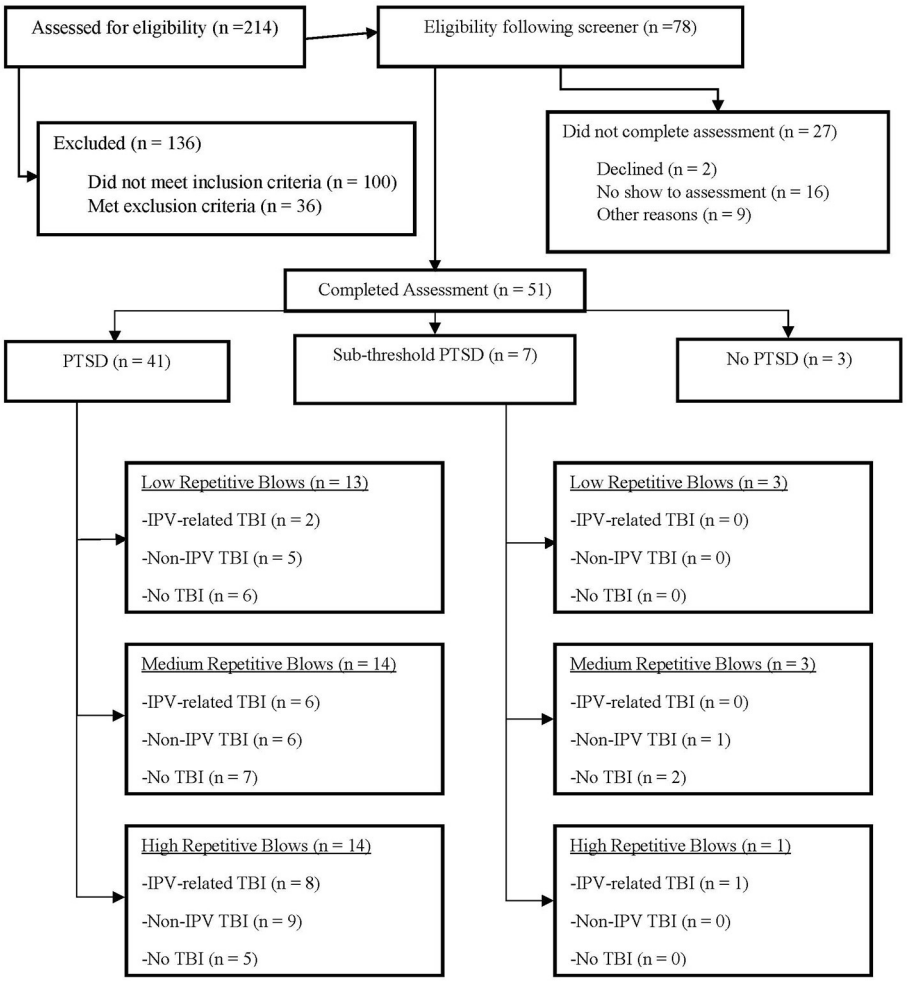

FIGURE 2 | CONSORT diagram of study participants. The CONSORT flow diagram of the participants through the phases of assessment, further differentiated by PTSD status. The diagram represents low, medium, and high head injury rates for those participants who both meet for a full PTSD diagnosis, as well as those with subthreshold PTSD. PTSD, Post-Traumatic Stress Disorder; TBI, Traumatic Brain Injury. Other reasons for not completing the assessment after being found eligible include changes to the participants condition prior to or on the day of consent: bipolar disorder, active psychosis, chemotherapy, peritraumatic experience, pregnancy, moved out of state, multiple sclerosis.

(study investigators with relevant expertise in diagnosing TBI and psychiatric disorders) to achieve a consensus diagnosis. Interviews took ∼4 h to conduct, though time was not limited and varied somewhat depending on number of traumas reported, psychiatric diagnoses, and head injuries.

Trauma Exposure

Lifetime exposure to traumatic events was assessed via a locally constructed clinician-administered interview (60). This interview captured participants' trauma history across the lifespan, history of intimate relationships with a specific focus on violence within those relationships, injuries sustained during assaults by intimate partners, and utilization of resources following IPV (e.g., health care, law enforcement). This information was supplemented with a battery of standardized self-report measures, a complete list of which can be found in **Table 1**.

Assessment of PTSD

The Clinician Administered PTSD Scale for DSM-5 (CAPS-5) was used to assess for PTSD. The CAPS-5 is considered the gold-standard in PTSD assessment (79) for diagnosing current (past month) and lifetime PTSD. Weathers and colleagues (80) reported on the psychometric properties of the CAPS-5 in male combat veterans demonstrating strong interrater reliability (κ = 0.78–1.00, depending on the scoring rule) and test–retest reliability (κ = 0.83), as well as strong correspondence with a diagnosis based on the CAPS for DSM–IV (CAPS-IV; κ = 0.84 when optimally calibrated). CAPS-5 total severity score demonstrated high internal consistency ($\alpha = 0.88$) and interrater reliability (ICC = 0.91), good test–retest reliability (ICC = 0.78), and good convergent validity with total severity score on the CAPS-IV (r =0.83). Inter-rater reliability via an external doctoral-level CAPS expert for CAPS scoring consensus was performed [Cohen's $\kappa = 0.70$ (current); 0.75 (lifetime)].

TABLE 1 | Self-report measures.

Domain/Test	Abbreviation	Description	References
Traumatic Exposure and Trauma Symptoms			
Women's Experience with Battering	WEB	Measures level of psychological vulnerability experienced in intimate relationships (i.e., perceptions of vulnerability to danger, loss of control to partner, disempowerment)	(61)
Composite Abuse Scale	CAS	Measures four dimensions of abuse: Severe Combined Abuse, Emotional Abuse, Physical Abuse, and Harassment	(62)
Conflict Tactics Scale	CTS-2	Assesses five ways in which conflict can be resolved in an intimate relationship, including: negotiation, physical aggression, physical assault, sexual coercion, and injury	(63)
PTSD Checklist DSM-5	PCL-5	Assesses DSM-5 symptoms of PTSD	(59)
Childhood Trauma Questionnaire	CTQ	Retrospective assessment of childhood abuse and neglect. Five clinical scales include: physical, sexual, emotional abuse, and physical and emotional neglect.	(64)
Psychological Distress Psychosocial Impairment			
Post-Traumatic Cognitions Inventory	PTCI	Measure of trauma-related thoughts and beliefs. Three subscales include: Negative Cognitions About the Self, Negative Cognitions About the World, and Self-Blame.	(65)
Neurobehavioral Symptoms Inventory	NSI	Measure of post-concussive symptom severity, includes three subscales: somatic/sensory, affective, cognitive	(66)
Pittsburgh Sleep Quality Index	PSQI	Measure of sleep quality that produces global score and seven subscale scores, including: sleep quality, sleep onset latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction	(67)
Depression and Anxiety Stress Scale	DASS-21	Produces three subscale scores to assess for severity of distress related to depression, anxiety, and stress	(68)
Brief Pain Inventory Short Form	BPI-SF	Assesses the severity of pain and the impact of pain on daily functions	(69)
State Trait Anger Expression Inventory	STAXI	Measure of the experience, expression, and control of anger. The measure consists of six primary subscales, including State Anger, Trait Anger, Anger-In, Anger-Out, Anger Control, and Anger Expression	(70)
Quality of Life Inventory	QOLI	Provides global measure of life satisfaction based on average of satisfaction ratings across a range of life functions	(71)
Satisfaction with Life Scale	SWLS	Global measure of life satisfaction using broad appraisal of life without differentiating between different domains	(72)
Fagerstrom Test for Nicotine Dependence	FTND	Measures personal history of current and chronic cigarette use and/or use of smokeless tobacco products	(73)
World Health Organization Disability Assessment Schedule 2	WHODAS-2	Measure of impairment due to health-related problems experienced in the past month. Assesses across six domains and includes general disability score.	(74)
Sensory Functioning			
Hearing Handicap Inventory for Adults	HHIA	Assess emotional, social/situational, and occupational reactions to hearing loss	(75)
Tinnitus Handicap Inventory	THI	Quantifies impact of tinnitus on daily living. 25 questions divided into 3 subgroups: functional, emotional and catastrophic.	(76)
Vertigo Symptom Scale Long Form	VSSL	Quantifies vertigo severity and somatic anxiety symptoms.	(77)
Dizziness Handicap Inventory	DHI	Measures the handicapping effects of vestibular dysfunction across three subscales: physical, emotional, and functional factors of dizziness-related handicap.	(78)

Assessment of Psychiatric Comorbidity

The Structured Clinical Interview for DSM-5 Disorders (SCID-5) (81) is a semi-structured interview used to diagnose lifetime and current (past-month) DSM-5 psychiatric disorders. Interrater reliability for SCID-5 diagnoses have been found to be good to excellent with kappa coefficients ranging from 0.59 to 1.00 (82). SCID-5 diagnoses have also displayed adequate internal consistency (Cohen's $\alpha = 0.78–0.97$) (83). The following modules of the SCID were administered: Module A: mood disorders: bipolar I disorder, bipolar II disorder, major depressive disorder, persistent depressive disorder; Module B/C: psychotic screening; Module E: alcohol use disorder, substance use disorders; Module F: anxiety disorders: panic disorder, agoraphobia, social phobia, specific phobia, obsessive-compulsive disorder, generalized anxiety disorder (current only); Module I: feeding and eating disorders.

Assessment of Subconcussive Head Injury and TBI

The current study utilized an adapted form of the BAT-L, which has demonstrated validity and reliability for assessment

of subconcussive head injury and TBI across the lifespan (23). This semi-structured interview is designed to obtain a detailed account of the respondent's lifetime history of head injuries. The semi-structured interview establishes a detailed timeline and gathers contextual information for events occurring before, during, and after the injury to estimate the duration of acute TBI symptoms (AMS, PTA, LOC) and determine TBI severity. The BAT-L was originally developed to assess blast exposure and TBI in military samples (23) and has demonstrated excellent psychometric properties, including correspondence with the Ohio State University TBI Identification Method ($\kappa = 0.89$; Kendall $b = 0.95$), and excellent interrater reliability ($\kappa > 0.80$) (23). A particular strength of the BAT-L is its use of a forensic approach to gather in-depth contextual information to differentiate change in mental status (AMS/PTA/LOC) vs. vision/hearing difficulty or psychological distress (including dissociation) associated with the IPV event in order to increase accuracy of TBI diagnosis.

For this study the BAT-L was adapted by the study team to include a comprehensive assessment of potential IPV-related head injuries (both subconcussive head injury and TBI) and strangulation, referred hereafter to the BAT-L/IPV. This investigation was particularly interested in the effects of head injuries on associations between data elements. For the purposes of the current study, and to ensure stringent operationalization of the impact of specific type of injury we are assessing, we use the term "head injury" to describe injuries with the potential to cause neurobiological damage. Specifically, these include injuries resulting from assault by an intimate partner and include blunt force to the head (e.g., hit/punched in the face with fist, weapons or objects), head injuries resulting from falls and shoves, striking head on walls and furniture, and strangulation. We are not including other common IPV-related injuries to the face and neck that would not cause neurobiological damage (e.g., those that result from cutting, knifing, or burning) in our definition of head injury.

The BAT-L/IPV determined: (1) estimated lifetime incidence of IPV-related subconcussive head injury; (2) whether such injuries met criteria for IPV-related TBI; (3) lifetime incidence of IPV-related subconcussive head injury; (4) whether such injuries met criteria for lifetime non-IPV TBI; (5) lifetime incidence of strangulation; and (6) whether such injuries resulted in LOC. The incidence and severity of TBIs is based on American Congress of Rehabilitation Medicine standards and Department of Defense (DoD) criteria (see **Figure 1**); mTBIs, or concussion, are further subdivided into grade I, II, or III injuries (20, 84, 85). Finally, the BATL/IPV allows investigators to assess and detect the effects of cumulative subconcussive head injury (that did not meet diagnostic criteria for TBI) on outcomes. In summary, this instrument is critical in accurately diagnosing TBI and categorizing more heterogenous subconcussive head injury. Following administration of the BAT-L/IPV diagnostician should have a comprehensive clinical picture of the timing, number, developmental period, and severity of TBI and head injury across the lifetime and be able to estimate the cumulative effects of subconcussive blow both lifetime and within and IPV relationship. Interrater reliability of the IPV BAT-L/IPV in this study is strong ($\kappa s = 0.89$; 38).

Self-Report Measures

To capture the extent of the experience of trauma and the impact on psychological, psychosocial and physical health indicators, a number of valid and reliable self-report measures were included in the battery to assess anger, health status, experiences with trauma, psychopathology, quality of life, sleep, and disability. Participants completed each measure during her assessment session. The complete list of measures and their descriptions are provided in **Table 1**.

Neuropsychological Functioning Assessment

The neuropsychological assessment battery included a comprehensive approach to assess cognitive functioning targeted to potential impairment associated with PTSD and TBI. The battery included assessments of premorbid abilities, attention, executive functioning, working memory, verbal learning and memory, psychomotor function, and symptom validity using both standard clinical neuropsychological tests as well as more precise computerized cognitive neuroscience measures (see **Table 2**). In addition to measurement considerations, such as the validity and reliability of tests, practical consideration (i.e., time demand and availability of alternate forms) guided test selection. We also implemented measures from the NIH Toolbox Cognitive Battery to include common data element recommendations by the NIH.

Neuroimaging

As a primary aim of the current study was to understand the effects of PTSD and head injury on the brain structure, function, and connectivity following IPV, neuroimaging methodologies including structural, diffusion, and resting state functional imaging were included in our assessment (see **Table 3**). Consistent with the TRACTS protocol (93), we used a 3T Siemens Prisma MRI for image acquisition. Two whole-brain high-resolution images were acquired for each individual. These images were averaged for each participant to create a single image with high contrast-to-noise. Total imaging time was ∼90 min for each scan. The MRI sequences and data processing assess properties of cortical and subcortical gray matter, microstructural integrity of the cerebral white matter, resting state networks, and functional connectivity.

Blood-Based Biomarkers

Due to a dearth of literature focused on blood-based biomarkers for PTSD and TBI in an IPV sample, participants were asked to fast for 12 h prior to their blood being drawn and a certified phlebotomist drew 80 milliliters of blood from each participant. All staff and personnel handling blood samples received proper safety training overseen by the UMSL Environmental Health and Safety Department. Though a complete list of all blood analyses exceeds the scope of this paper, it is important to note that assays included in the current study were consistent with overall indicators of heath, as well as neuroendocrine and immune markers previously found to be associated with PTSD and TBI

TABLE 2 | Neuropsychological function assessment.

Measure	Domain/construct	References
Wechsler Test of Adult Reading (WTAR)	Premorbid verbal IQ	(86)
Green Verbal Medical Symptom Validity Tests (V-MSVT)	Validity	(87)
Gradual Onset Continuous Performance Task (GradCPT)	Attention and executive function: inhibition	(88)
Delis Kaplan Executive Function Scale (DKEFS) Color-Word Interference Test	Executive function: inhibition	(89)
Delis Kaplan Executive Function Scale (D-KEFS) Trail Making Test 2,4, and 5	Attention, psychomotor speed, executive functioning: sequencing, set-shifting	(89)
Iowa Gambling Test (IGT)	Executive functioning: decision making	(90)
California Verbal Learning Test-II (CVLT-II)	Verbal learning and memory	(91)
NIH Toolbox Cognition Battery		(92)
Picture Vocabulary	Memory (episodic)	
Flanker Inhibitory Control and Attention	Attention and executive function: inhibition	
List Sorting Working Memory	Memory (working)	
Dimensional Change Card Sort	Verbal fluency	
Pattern Comparison Processing Speed	Attention and executive function: cognitive flexibility	
Picture Sequence Memory	Executive function: processing	

TABLE 3 | Neuroimaging assessment.

Domain/Test	Measure	Sequence
Structural morphometry	2X 3D T1-weighted MPRAGE Run 1	Flip Angle 7 deg, TE 3.35 ms, TR 2,530 ms, Slice Thickness 1.0 mm, In-Plane resolution 1.0 x 1.0 mm, Acquisition Time (TA) 6:02
Structural connectivity	2D Diffusion AP and PA	60 directions, b value=700, Flip Angle 90 deg, TE 103 ms, TR 10,000 ms, Slice Thickness 2.0 mm, In-Plane resolution 2.0 x 2.0 mm, TA 12:12
Functional Neuroimaging	BOLD Resting State Run 1	Flip Angle 90 deg TE 30 ms TR 3,000 ms Slice Thickness 3.0 mm FOV 192 mm In-Plane Resolution: 3 x 3 mm, TA 6:06
	BOLD Resting State Run 2	Parameters copied from BOLD Resting State Run 1
	BOLD Resting State Field Map	Flip Angle 90 deg TE 30 ms TR 3,000 ms Slice Thickness 3.0 mm FOV 192 mm In-Plane Resolution 3 x 3 mm, TA 4.5s
	Spin Echo Field Maps AP and PA	Flip Angle 90 deg TE 58 ms TR 3,500 ms Slice Thickness 3.0 mm FOV 192 mm In-Plane Resolution 3 x 3 mm, TA 0:14
Additional Scans	T2-weighted 3D FLAIR	Flip Angle 120 deg, TE 388 ms, TR 6,000 ms, Slice Thickness 1.0 mm, In-Plane Resolution 0.49 x 0.49 mm, TA 7:02
	T2-weighted 3D SPACE	Flip Angle 120 deg, TE 284 ms, TR 3,200 ms, Slice Thickness 1.0 mm, In-Plane Resolution 1.0x 1.0 mm, TA 4:46
	3D Susceptibility-weighted imaging (SWI)	Flip Angle 15 deg, TE 20 ms, TR 27 ms, Slice Thickness 1.20 mm, In-Plane Resolution 1.2 x 1.2 mm, TA 4:24

in other populations (e.g., Cortisol, Brain-derived neurotrophic factor, Neuron-specific enolase, Interleukin −10 & −6, and Tau). After samples were collected, a portion were processed (centrifuged and aliquot) and transferred to Quest Diagnostics Inc. to generate data on general health indicators as well as to the Massachusetts Veterans Epidemiology Research and Information Center laboratory at VA Boston for where they were frozen −80 degrees Celsius for additional future biomarker testing.

RESULTS

Sample Demographic and Clinical Characteristics - Descriptive Statistics

Only demographic and clinical characteristics are described in this report. As detailed in **Table 4**, this sample was predominantly white (66.7%), with an average age of 32.6 (SD = 7.1). Nearly one-third of the sample had either a bachelor's or advanced degree (29.4%) and 37.3% reported <$15,000 in annual household income and 31.4% reported an annual household income between $15,000 and $35,000.

Trauma Exposures

The women in this sample reported high rates of trauma exposure during their lifetime. Regarding childhood trauma, exposures to various types of abuse are described in **Table 4**. Eighty percent of women reported sexual violence in their lifetimes (70.6% child, 45.1% adult) outside of an IPV relationship, and 56.9% reported non-IPV physical violence in their lifetimes (47.1% child, 29.4% adult). Further, on average, women reported spending half of their adult lives in an IPV

TABLE 4 | Sample demographics and descriptive characteristics.

Full Sample (*n* = 51)	***n* (%)/M ± SD**			
Age	32.6 ± 7.1			
Education				
High School/GED	9 (17.6%)			
Vocational/Technical Training	5 (9.8%)			
Some College Credit	15 (29.4%)			
Associate Degree	7 (13.7%)			
Bachelor's Degree	11 (21.6%)			
Post Grad Program	4 (7.8%)			
Race				
White	34 (66.7%)			
Black	10 (19.6%)			
Mixed Race/Other	7 (13.7%)			
Non-IPV Trauma Exposure	**Total prevalence**	**1–5 Times**	**6–20 Times**	**21+ Times**
Childhood Trauma	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
Sexual Assault	36 (70.6%)	21 (41.2%)	8 (15.6%)	7 (13.7%)
Physical Assault	24 (47.1%)	10 (19.6%)	3 (5.9%)	11 (21.6%)
Serious Accident	10 (19.6%)	10 (19.6%)	-	-
Exposure to Toxic Substance	2 (3.9%)	2 (3.9%)	-	-
Witnessed Sudden Violent Death	9 (17.7%)	9 (17.7%)	-	-
Sudden, Unexpected Death of Someone Close	15 (29.4%)	15 (29.4%)	-	-
Serious Injury, Harm, or Death You Caused	1 (2.0%)	1 (2.0%)	-	-
Captivity	4 (7.8%)	4 (7.8%)	-	-
Community Violence	4 (7.8%)	2 (3.9%)	2 (3.9%)	-
Adult Trauma	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
Sexual Assault	23 (45.1%)	18 (35.2%)	1 (2.0%)	4 (7.9%)
Physical Assault	15 (29.4%)	12 (23.5%)	2 (4.0%)	1 (2.0%)
Serious Accident	26 (51.0%)	25 (49.0%)	1 (2.0%)	-
Exposure to Toxic Substance	6 (11.8%)	4 (7.8%)	2 (3.9%)	-
Witnessed Sudden Violent Death	12 (23.5%)	10 (19.6%)	1 (2.0%)	1 (2.0%)
Sudden, Unexpected Death of Someone Close	35 (68.7%)	34 (66.7%)	1 (2.0%)	-
Serious Injury, Harm, or Death You Caused	5 (9.8%)	4 (7.8%)	1 (2.0%)	-
Captivity	11 (21.6%)	9 (17.7%)	1 (2.0%)	1 (2.0%)
Community Violence	19 (39.2%)	10 (19.6%)	6 (11.8%)	3 (5.9%)
IPV Trauma Exposure	***n* (%)/M ± SD**			
Any IPV	51 (100%)			
Physical	48 (94.1%)			
Sexual	36 (70.6%)			
Psychological/Emotional	49 (96.1%)			
Number of IPV relationships	2.6 ± 1.4			
Percent of adult life spent in IPV relationship	50.0% ± 32.1%			
Age at first IPV relationship experience	19.1 ± 5.8			
Time since last IPV abuse (Months)				
Physical assault	31.6 ± 37.0			
Sexual assault	51.7 ± 55.7			
Emotional abuse	31.6 ± 51.0			
Stalking	56.8 ± 70.3			
Subconcussive Head Injury Information	***n* (%)/M ± SD**			
Prevalence Subconcussive Head Injury (lifetime)	45 (88.2%)			

(Continued)

TABLE 4 | Continued

Full Sample ($n = 51$)	***n* (%)/M ± SD**			
Number of Subconcussive HI (lifetime)*	2.8 ± 1.6			
Years since most recent HI (lifetime)*	6.7 ± 7.7			
Prevalence Subconcussive Head Injury (secondary to IPV)	39 (76.5%)			
Number of Subconcussive HI (secondary to IPV)*	1.8 ± 0.9			
Months Since Most Recent Subconcussive HI*	6.4 ± 6.5			
		***n* (%)**	***n* (%)**	***n* (%)**
Total Repetitive Blows	29.6 ± 41.7	**Low (0–10)**	**Medium (11–24)**	**High (≥25)**
		17 (33.3%)	17 (33.3%)	17 (33.3%)
TBI Descriptive	***n* (%)/M ± SD**			
Prevalence of TBI (lifetime)	27 (52.9%)			
Number of TBI (lifetime)*	1.9 ± 1.1			
Months Since Most Recent TBI (lifetime)*	9.1 ± 7.0			
Prevalence of TBI (secondary to IPV)	18 (35.3%)			
Number of TBI (secondary to IPV)*	1.3 ± 0.8			
Months Since Most Recent IPV-TBI*	10.1 ± 8.4			
Prevalence of Chocking/Anoxic event	16 (31.4%)			
Choking With LOC	4 (7.8%)			
Age of first TBI (by developmental stage)		**Age 0–12**	**Age >12–18**	**Age >18**
		5 (18.5%)	11 (40.7%)	21 (77.8%)
PTSD	**Current**	**Lifetime**		
PTSD diagnosis	41 (80.4%)	45 (88.2%)		
PTSD severity (CAPS)	35.1 ± 7.1	43.5 ± 9.6		
PTSD severity (PCL-5)	48.7 ± 12.7	-		
Comorbid Psychiatric Disorders	**Current**	**Lifetime**		
Major Depressive Disorder	11 (21.6%)	22 (43.1%)		
Panic Disorder	6 (11.8%)	1 (2.0%)		
Alcohol Use Disorder	9 (17.6%)	23 (45.1%)		
Cannabis Use Disorder	8 (15.7%)	12 (23.5%)		
Opioid Use Disorder	1 (2.0%)	7 (13.7%)		

**Indicates values represent the M ± SD for the sub-group that endorsed experiencing the injury. n = 3 in the low repetitive blows group endorsed no history of head injury; GED, General Educational Development; IPV, Intimate Partner Violence; HI, Head Injury; TBI, Traumatic Brain Injury; PTSD, Post-Traumatic Stress Disorder; CAPS-5, Clinician Administered PTSD Scale for DSM-5; PCL-5, PTSD Checklist for DSM-5.*

relationship (50.0%) with a range from 16.7 to 95.5%. Within IPV relationships, all women reported psychological/emotional violence, nearly all reported physical violence (96.1%), and 72.6% reported sexual violence.

PTSD

Given the rate of total lifetime trauma exposure, it is perhaps unsurprising that the sample also reported high levels of post-traumatic stress. Of the 51 women, 41 met full criteria for current PTSD (per CAPS-5 assessment) and 7 met for sub-threshold PTSD (within 1 SD below the mean CAPS-5 severity score).

Subconcussive Head Injury and TBI

Of the 51 women, 88.2% reported experiencing one or more subconcussive head injuries in their lifetime ($M = 2.5$, $SD = 1.8$, $Range = 1–8$ incidents), with 76.5% reporting suffering one or more subconcussive head injuries within the context of IPV with an average of 1.8 ($SD = 0.9$, $Range = 1–4$) separate assaults resulting in a head injury (**Table 4**). Twenty-seven women met diagnostic criteria for at least one TBI (52.9%) within their lifetime and a third (35.3%) reported at least one TBI secondary to an assault by an intimate partner. Importantly, all reported TBIs were diagnosed as mild in severity. Nearly half of all TBIs reported occurred in adulthood (41.7%), with an extended period of time between the assessment and the most recent TBI ($M = 9.1$ years; $SD = 7.0$). Within those that reported TBI, the mean number of lifetime TBI was 1.93 ($SD = 1.1$, $Range = 1–5$) and the average number of TBIs that occurred within the context of an IPV relationship was 1.33 ($SD = 0.77$, $Range = 1–4$). Notably, pertaining to IPV-related events, 16 (31.4%) of the women reported that they had been strangled; 4 of whom reported losing consciousness as a result, indicating a possible anoxic event. Exact duration of unconsciousness is unknown, but all LOC secondary to strangulation were described as brief.

The experience of repetitive, sub-concussive blows (not resulting in a diagnosable TBI) to the head, face, and neck within the context of an IPV relationship was pervasive in this sample. Forty-eight (94.1%) women reported experiencing one

or more subconcussive head injuries within an IPV relationship and endorsed, on average, 29.6 (SD = 41.7) repetitive blows to their head, face, and neck (**Table 4**).

DISCUSSION

The overarching goal of this report was to provide a description of this unique multi-method assessment of the impact of head injuries on PTSD secondary to IPV in women. To our knowledge, this study represents the most comprehensive, multi-method assessment of PTSD and TBI among multiply traumatized women who have experienced violence in intimate relationships to date. Content and methodological experts in each area of inquiry were included in this multi-disciplinary team to ensure accurate assessments using state of the art methodology and gold standard clinician-administered instruments. A notable limitation in previous studies in the IPV literature is the lack of characterization of TBI and sub-concussive head injuries in the context of psychological distress. The current study aimed to address this deficit by developing clear methodology to assess and differentiate subconcussive head injury vs. TBI. This unique and innovative assessment is necessary to discriminate psychiatric symptoms from organic alterations in neurological structure and function due to head trauma.

A secondary goal of this report was to provide descriptive statistics of our sample given the relative paucity of studies in the IPV population and the lack of consensus within the available body of literature. Although research on the impact of TBI on PTSD has proliferated in recent years, the vast majority of these studies have been conducted in populations who have suffered these injuries through sports, falls, and combat-related concussive blasts. Research examining the impact of subconcussive head injury and TBI specifically in an IPV population has lagged far behind, despite the fact that the numbers of these types of injuries trump those in parallel populations combined. Generalizing the results of studies conducted in parallel head-injured populations to the IPV population is inadequate. Likewise, assessment of TBI and PTSD individually is far less effective than considering their interaction. Understanding the interactive effects of TBI and PTSD can only be accomplished through multi-modal methodology. This study represents the first in the IPV literature to include data collected via neuropsychological assessment, neuroimaging, and blood-based biomarkers while incorporating a full assessment battery measuring psychological distress and functional impairment, a comprehensive assessment of lifetime head injuries and exposure to traumatic events, and a full psychiatric history assessed via gold standard clinician-administered interviews.

Studies that have assessed head injuries in IPV samples have varied widely in their reports of the prevalence of TBI, in part due to significant inconsistencies in methodological approaches to TBI assessment and diagnosis (surveys, self-report, and clinical interviews). The accurate diagnosis of TBI is a critical first step in understanding the extent of this type of injury in the IPV population and its impact on recovery from PTSD. Toward this end, we modified the BAT-L, a semi-structured interview used to diagnose combat-related TBI in post 9/11 Veterans with demonstrated psychometric properties (23). This interview has several strengths including its ability to differentiate symptoms that are better attributable to psychological distress such as dissociation, confusion, and disorientation from symptoms of TBI such as AMS, PTA, and LOC. The BAT-L was modified to include IPV-specific probes designed to query the unique experiences and injuries of IPV survivors. The ability to differentiate subconcussive blows from TBIs within and outside of the context of IPV is a strength of the BAT-L/IPV [see (38) for more detail]. Using this comprehensive diagnostic assessment, we found lower rates of TBI than reported in several previous studies (Range: 28–100%; 6, 14, 25, 35). That said, 35.3% of our sample described a blunt force IPV-related injury that met criteria for a TBI and 76.5% reported one or more subconcussive head injuries secondary to an IPV-related assault. The BAT-L/IPV also queries injuries related to strangulation given the prevalence of this type of experience in IPV and its potential for brain injury. Approximately one-third of study participants reported strangulation severe enough to cause physiological disruption with ∼8% of those incidents resulting in LOC. Importantly, the BAT-L/IPV also assesses severe, non-IPV head injuries across the lifetime. We detected a lifetime history of TBIs in half of the sample and a history of subconcussive blows in 88% of participants. This type of comprehensive assessment of lifetime head injury is critical in understanding the cumulative contribution of brain injury to participants' current clinical presentation.

The TRACTS assessment battery (93) was also expanded to assess the context in which IPV occurs as well as the individual's history of exposure to trauma that pre-dated the IPV relationship(s). Expansions included a number of self-report measures specific to IPV (see **Table 1**) and a clinician-administered IPV Trauma Interview developed specifically for this population (60). Consistent with previous research, participants reported complex histories of exposures to traumatic events throughout childhood and multiple exposures to non-IPV adult traumas. With respect to IPV, nearly all (94%) of the participants reported physical assaults, emotional abuse (96%), and sexual assaults (71%). The full complexity of participants' trauma history is apparent given the high rates of childhood abuse and early age of first IPV experience (on average, participants were 19 years old when first assaulted by an intimate partner). Multiple IPV relationships were common as, on average, women reported 2–3 different relationships with an average of 50% of adult lives being spent in a violent relationship. Understanding the full scope and breadth of exposure to trauma is a critical first step in diagnosing PTSD. Choosing the index trauma (worst event) on which to anchor the PTSD diagnosis from this complex array of different traumas can be clinically challenging and requires this level of assessment.

Utilization of gold standard, clinician-administered diagnostic instruments such as the CAPS-5 (59) and SCID-5 (81) to arrive at accurate lifetime and current psychiatric diagnoses secondary to the index trauma is a strength of this study. Study results revealed high rates of full diagnoses of current PTSD (80%)

and co-occurring disorders such as major depression, panic disorder, and alcohol and substance use disorders. These rates of psychopathology were not surprising given that meeting clinical cutoffs for the PTSD screener was a necessary criteria for inclusion in the study. In sum, accurate diagnoses of TBI, detection of subconcussive blows, accurate diagnoses of PTSD and the full range of comorbid psychiatric disorders, and a complete assessment of lifetime trauma history including both IPV and non-IPV related traumas set the backdrop for future planned study hypotheses incorporating imaging, neuropsychological and blood-based biomarker data.

Data-sharing is another important advance in this area of research. With the informed consent of research participants, data collected from this sample will be incorporated into the larger TRACTS Data Repository (93). This repository houses longitudinal data from a cohort of over 500 post 9/11 deployed or scheduled-to-be deployed service members. An ongoing study, the TRACTS cohort consists of an ∼90% male, ∼75% White, and 100% military sample. Incorporating this data from a female sample of survivors of IPV will allow for future planned comparisons across genders and trauma types. Careful replication of the assessment battery developed by the TRACTS team allows for this seamless integration of data from female survivors of IPV.

Limitations

This study is not without limitations. First, the design is retrospective and cross-sectional in nature. As such, the results of the study cannot be used to determine a cause-and-effect relationship; moreover, it may be difficult to determine whether some of the outcomes of interest followed exposure to head injury or vice versa. To address this limitation, the study team relied on both semi-structured interviews and self-report measures that are specifically designed to map timelines of injury and related symptoms. Additionally, participants that did not screen for probable PTSD cutoff scores were excluded from the study ($N = 24$) which limits the variance in PTSD symptomatology and may affect our ability to discriminate between TBI-related and PTSD-related neuropsychiatric symptoms following head injuries of IPV survivors. Self-report measurement has inherent limitations of its own, including potential lack of insight or the unintentional or intentional misrepresentation of experiences. To reduce these biases, all major outcomes of interest including head trauma and psychopathology were assessed with gold standard, clinician-administered interviews. However, it should also be noted that the interviews required participants to retrospectively report data that is difficult to recall such as length of time spent unconscious and/or amnesia. While the forensic approach used in the BAT-L/IPV is considered state-of-the-art methodology in collecting this data retrospectively, the lack of an accurate medical record collected at the time of the injury is a limitation. Finally, this study focused on women survivors of IPV and results will not be generalized beyond that population.

Future Directions

This study has confirmed that the incidence of head injury is substantial and that further research is warranted to understand the impact of this type of injury on recovery from both physical and mental injury. In planned future publications, we will used the methods described in this paper to characterize the relative contributions of TBI and/or subconcussive head injury to psychiatric, psychological, and functional outcomes in this population with the ultimate goal of identifying novel targets for intervention and enhancing the overall effectiveness of current, single modal treatment strategies.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the data are owned by the Boston Veteran Affairs Healthcare System and are subject to oversight by the VA. Requests to access the datasets should be directed to tara.galovski@va.gov.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Institutional Review Boards (IRB) at University of Missouri - St. Louis (IRB #1216580), Washington University in St. Louis (IRB #201810061), and VA Boston Healthcare System (Research and Development #10521). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

TG, KI, KW, and SK took the lead in writing the manuscript. TG conceived of the present idea and conceptual development the study. TG developed and led the study throughout implementation to manuscript preparation, supervising the project throughout. KI contributed significantly to the design of the research and the focus of the manuscript. KW managed the implementation of the study and coordination between research teams. CF contributed in the conceptualization of main outcome and how to interpret head injury vs. traumatic brain injury. AC processed the data and performed data analyses and prepared analytic tables for the current manuscript. JF supervised AC and assisted in data analyses and developed the data system and syntax used. DS and RM designed to original protocol that we replicated, modified, and expanded for our female intimate partner survivor sample. CF and RM also assisted in Figure and Table development. All authors discussed the development of the current protocol, and contributed by providing critical feedback which helped shape the research, analysis and manuscript.

ACKNOWLEDGMENTS

This research was supported by the National Center for PTSD, a VA Center for Excellence and, in part, by the Translational Research Center for TBI and Stress Disorders (TRACTS), a VA Rehabilitation Research and Development National Research Center for Traumatic Brain Injury (B3001-C).

REFERENCES

1. Niolon PHM, Kearns J, Dills K, Rambo S, Irving T, Armstead L, et al. *Preventing Intimate Partner Violence Across the Lifespan: A Technical Package of Programs, Policies, and Practices*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (2017).
2. Breiding MK, Basile CSG, Smith MC, Black, Mahendra RR. *Intimate Partner Violence Surveillance: Uniform Definitions and Recommended Data Elements*. Version 2.0. National Center for Injury Prevention and Control of the Centers for Disease Control and Prevention (2015).
3. Smith SGJ, Chen KC, Basile LK, Gilbert MT, Merrick N, et al. *The National Intimate Partner and Sexual Violence Survey (NISVS): 2010-2012 State Report*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (2017).
4. Caldwell JE, Swan SC, Woodbrown VD. Gender differences in intimate partner violence outcomes. *Psychol Violence*. (2012) 2:42. doi: 10.1037/a0026296
5. Wong JYH, Fong DYT, Lai V, Tiwari A. Bridging intimate partner violence and the human brain: a literature review. *Trauma Violence Abuse*. (2014) 15:22–33. doi: 10.1177/1524838013496333
6. Valera EM, Berenbaum H. Brain injury in battered women. *J Consult Clin Psychol*. (2003) 71:797. doi: 10.1037/0022-006X.71.4.797
7. Zieman G, Bridwell A, Cárdenas JF. Traumatic brain injury in domestic violence victims: a retrospective study at the barrow neurological institute. *J Neurotrauma*. (2017) 34:876–80. doi: 10.1089/neu.2016.4579
8. Campbell JC, Webster D, Koziol-McLain J, Block C, Campbell D, Curry MA, et al. Risk factors for femicide in abusive relationships: results from a multisite case control study. *Am J Public Health*. (2003) 93:1089–97. doi: 10.2105/AJPH.93.7.1089
9. Golding JM. Intimate partner violence as a risk factor for mental disorders: a meta-analysis. *J Family Violence*. (1999) 14:99–132. doi: 10.1023/A:1022079418229
10. Iverson KM, Mercado R, Carpenter SL, Street AE. Intimate partner violence among women veterans: previous interpersonal violence as a risk factor. *J Traumat Stress*. (2013) 26:767–71. doi: 10.1002/jts.21867
11. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders* 5th ed. Washington, DC: Publisher (2013). doi: 10.1176/appi.books.9780890425596
12. Woods SJ. Prevalence and patterns of posttraumatic stress disorder in abused and postabused women. *Issues Mental Health Nurs*. (2000) 21:309–24. doi: 10.1080/016128400248112
13. Cimino AN, Yi G, Patch M, Alter Y, Campbell JC, Gundersen KK, et al. The effect of intimate partner violence and probable traumatic brain injury on mental health outcomes for black women. *J Aggres Maltreat Trauma*. (2019) 28:714–31. doi: 10.1080/10926771.2019.1587657
14. Iverson KM, Dardis CM, Pogoda TK. Traumatic brain injury and PTSD symptoms as a consequence of intimate partner violence. *Comprehens Psychiatry*. (2017) 74:80–7. doi: 10.1016/j.comppsych.2017.01.007
15. Iverson KM, Dardis CM, Grillo AR, Galovski TE, Pogoda TK. Associations between traumatic brain injury from intimate partner violence and future psychosocial health risks in women. *Comprehens Psychiatry*. (2019) 92:13–21. doi: 10.1016/j.comppsych.2019.05.001
16. Valera EM, Campbell J, Gill J, Iverson KM. Correlates of brain injuries in women subjected to intimate partner violence: identifying the dangers and raising awareness. *J Aggres Maltreat Trauma*. (2019) 28:695–713. doi: 10.1080/10926771.2019.1581864
17. Valera EM, Cao A, Pasternak O, Shenton ME, Kubicki M, Makris N, et al. White matter correlates of mild traumatic brain injuries in women subjected to intimate-partner violence: a preliminary study. *J Neurotrauma*. (2019) 36:661–8. doi: 10.1089/neu.2018.5734
18. Kwako LE, Glass N, Campbell J, Melvin KC, Barr T, Gill JM. Traumatic brain injury in intimate partner violence: a critical review of outcomes and mechanisms. *Trauma Violence Abuse*. (2011) 12:115–26. doi: 10.1177/1524838011404251
19. Demery JA, Larson MJ, Dixit NK, Bauer RM, Perlstein WM. Operating characteristics of executive functioning tests following traumatic brain injury. *Clin Neuropsychol*. (2010) 24:1292–308. doi: 10.1080/13854046.2010.528452
20. Kay T, Harrington DE, Adams R, Anderson T, Berrol S, Cicerone K, et al. Definition of mild traumatic brain injury. *J Head Trauma Rehabil*. (1993) 8:86–7. doi: 10.1097/00001199-199309000-00010
21. Menon DK, Schwab K, Wright DW, Maas AI. Position statement: definition of traumatic brain injury. *Arch Phys Med Rehabil*. (2010) 91:1637–40. doi: 10.1016/j.apmr.2010.05.017
22. Faul M, Xu L, Wald MM, Coronado VG. *Traumatic Brain Injury in the United States. Emergency Department Visits, Hospitalizations and Deaths 2002–2006*. Atlanta, GA: Centers for Disease Control and Prevention (2010). doi: 10.15620/cdc.5571
23. Fortier CB, Amick MM, Grande L, McGlynn S, Kenna A, Morra L, et al. The Boston Assessment of Traumatic Brain Injury-Lifetime (BAT-L) semistructured interview: evidence of research utility and validity. *J Head Trauma Rehabil*. (2014) 29:89–98. doi: 10.1097/HTR.0b013e3182865859
24. Blennow K, Hardy J, Zetterberg H. The neuropathology and neurobiology of traumatic brain injury. *Neuron*. (2012) 76:886–99. doi: 10.1016/j.neuron.2012.11.021
25. Bryant RA. Mental disorders and traumatic injury. *Depression Anxiety*. (2011) 28:99–102. doi: 10.1002/da.20786
26. St Ivany A, Schminkey D. Intimate partner violence and traumatic brain injury: state of the science and next steps. *Family Commun Health*. (2016) 39:129–37. doi: 10.1097/FCH.0000000000000094
27. Haag H, Jones D, Joseph T, Colantonio A. Battered and brain injured: traumatic brain injury among women survivors of intimate partner violence—a scoping review. *Trauma Violence Abuse*. (2019) 6:1524838019850623. doi: 10.1177/1524838019850623
28. Fritz PA, O'Leary KD. Physical and psychological partner aggression across a decade: a growth curve analysis. *Violence Victims*. (2004) 19:3–16. doi: 10.1891/088667004780842886
29. Plichta SB. Intimate partner violence and physical health consequences: policy and practice implications. *J Interpers Violence*. (2004) 19:1296–323. doi: 10.1177/0886260504269685
30. Sheridan DJ, Nash KR. Acute injury patterns of intimate partner violence victims. *Trauma Violence Abuse*. (2007) 8:281–9. doi: 10.1177/1524838007303504
31. Sutherland CA, Bybee DI, Sullivan CM. Beyond bruises and broken bones: the joint effects of stress and injuries on battered women's health. *Am J Commun Psychol*. (2002) 30:609–36. doi: 10.1023/A:1016317130710
32. Campbell JC, Anderson JC, McFadgion A, Gill J, Zink E, Patch M, et al. The effects of intimate partner violence and probable traumatic brain injury on central nervous system symptoms. *J Women Health*. (2018) 27:761–7. doi: 10.1089/jwh.2016.6311
33. Shah MK, Al-Adawi S, Dorvlo AS, Burke DT. Functional outcomes following anoxic brain injury: a comparison with traumatic brain injury. *Brain Injury*. (2004) 18:111–7. doi: 10.1080/0269905031000149551
34. Mechanic MB, Weaver TL, Resick PA. Risk factors for physical injury among help-seeking battered women: an exploration of multiple abuse dimensions. *Violence Against Women*. (2008) 14:1148–65. doi: 10.1177/1077801208323792
35. Smirl JD, Jones KE, Copeland P, Khatra O, Taylor EH, Van Donkelaar P. Characterizing symptoms of traumatic brain injury in survivors of intimate partner violence. *Brain Injury*. (2019) 33:1529–38. doi: 10.1080/02699052.2019.1658129
36. Kristman VL, Borg J, Godbolt AK, Salmi LR, Cancelliere C, Carroll LJ, et al. Methodological issues and research recommendations for prognosis after mild traumatic brain injury: results of the International Collaboration on Mild Traumatic Brain Injury Prognosis. *Arch Phys Med Rehabil*. (2014) 95:S265–77. doi: 10.1016/j.apmr.2013.04.026
37. Block CK, West SE, Goldin Y. Misconceptions and misattributions about traumatic brain injury: an integrated conceptual framework. *PMandR*. (2016) 8:58–68. doi: 10.1016/j.pmrj.2015.05.022
38. Fortier C, Beck B, Werner KB, Iverson KM, Kim S, Currao A, et al. The Boston Assessment of Traumatic Brain Injury–Lifetime (BAT-L/IPV) semistructured interview for assessment of TBI and subconcussive injury among female survivors of intimate partner violence: evidence of research utility and validity. *J Head Trauma Rehabil*. (2020).
39. Jackson H, Philp E, Nuttall RL, Diller L. Traumatic brain injury: a hidden consequence for battered women. *Professional Psychol*. (2002) 33:39–45. doi: 10.1037/0735-7028.33.1.39

40. Anderson JC, Stockman JK, Sabri B, Campbell DW, Campbell JC. Injury outcomes in African American and African Caribbean women: the role of intimate partner violence. *J Emerg Nurs*. (2015) 41:36–42. doi: 10.1016/j.jen.2014.01.015
41. Iverson KM, McLaughlin KA, Gerber MR, Dick A, Smith BN, Bell ME, et al. Exposure to interpersonal violence and its associations with psychiatric morbidity in a U.S. national sample: a gender comparison. *Psychol Violence*. (2013) 3:273–87. doi: 10.1037/a0030956
42. Widom CS, Czaja S, Dutton MA. Child abuse and neglect and intimate partner violence victimization and perpetration: a prospective investigation. *Child Abuse Negl*. (2014) 38:650–63. doi: 10.1016/j.chiabu.2013.11.004
43. Galovski TE, Smith BN, Micol RL, Resick PA. Interpersonal violence and head injury: the effects on treatment for PTSD. *Psychol. Trauma*. (2020). doi: 10.1037/tra0000976. [Epub ahead of print].
44. Okuda M, Olfson M, Hasin D, Grant BF, Lin KH, Blanco C. Mental health of victims of intimate partner violence: results from a national epidemiologic survey. *Psychiatr Serv*. (2011) 62:959–62. doi: 10.1176/ps.62.8.pss6208_0959
45. Davis A. Violence-related mild traumatic brain injury in women: identifying a triad of postinjury disorders. *J Trauma Nurs*. (2014) 21:300–8. doi: 10.1097/JTN.0000000000000086
46. Iverson KM, Pogoda TK. Traumatic brain injury among women veterans: an invisible wound of intimate partner violence. *Med Care J*. (2015) 53:S112–9. doi: 10.1097/MLR.0000000000000263
47. Stein MB, Kennedy CM, Twamley EW. Neuropsychological function in female victims of intimate partner violence with and without posttraumatic stress disorder. *Biol Psychiatry*. (2002) 52:1079–88. doi: 10.1016/S0006-3223(02)01414-2
48. Twamley EW, Allard CB, Thorp SR, Norman SB, Cissell SH, Berardi KH, et al. Cognitive impairment and functioning in PTSD related to intimate partner violence. *J Int Neuropsychol Soc*. (2009) 15:879–87. doi: 10.1017/S135561770999049X
49. Silver JM, McAllister TW, Arciniegas DB. Depression and cognitive complaints following mild traumatic brain injury. *Am J Psychiatry*. (2009) 166:653–61. doi: 10.1176/appi.ajp.2009.08111676
50. Andrews RJ, Fonda JR, Levin LK, McGlinchey RE, Milberg WP. Comprehensive analysis of the predictors of neurobehavioral symptom reporting in veterans. *Neurology*. (2018) 91:e732–45. doi: 10.1212/WNL.0000000000006034
51. Broshek DK, De Marco AP, Freeman JR. A review of post-concussion syndrome and psychological factors associated with concussion. *Brain Injury*. (2015) 29:228–37. doi: 10.3109/02699052.2014.974674
52. Waldron-Perrine B, Hennrick H, Spencer RJ, Pangilinan PH, Bieliauskas LA. Postconcussive symptom report in polytrauma: influence of mild traumatic brain injury and psychiatric distress. *Military Med*. (2014)179:856–64. doi: 10.7205/MILMED-D-13-00282
53. Meares S, Shores EA, Taylor AJ, Batchelor J, Bryant RA, Baguley IJ, et al. The prospective course of postconcussion syndrome: the role of mild traumatic brain injury. *Neuropsychology*. (2011) 25:454–65. doi: 10.1037/a0022580
54. Bonnelle V, Leech R, Kinnunen KM, Ham TE, Beckmann CF, De Boissezon X, et al. Default mode network connectivity predicts sustained attention deficits after traumatic brain injury. *J Neurosci*. (2011) 31:13442–51. doi: 10.1523/JNEUROSCI.1163-11.2011
55. Kinnunen KM, Greenwood R, Powell JH, Leech R, Hawkins PC, Bonnelle V, et al. White matter damage and cognitive impairment after traumatic brain injury. *Brain*. (2011) 134:449–63. doi: 10.1093/brain/awq347
56. Valera E, Kucyi A. Brain injury in women experiencing intimate partner-violence: neural mechanistic evidence of an invisible trauma. *Brain Imag Behav*. (2017) 11:1664–77. doi: 10.1007/s11682-016-9643-1
57. Pattinson CL, Gill JM, Lippa SM, Brickell TA, French LM, Lange RT. Concurrent mild traumatic brain injury and posttraumatic stress disorder is associated with elevated tau concentrations in peripheral blood plasma. *J Traumatic Stress*. (2019) 32:546–54. doi: 10.1002/jts.22418
58. Rasmusson AM, Pineles SL. Neurotransmitter, peptide, and steroid hormone abnormalities in PTSD: biological endophenotypes relevant to treatment. *Curr Psychiatr Rep*. (2018) 20:52. doi: 10.1007/s11920-018-0908-9
59. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. *The PTSD Checklist for DSM−5 (PCL-5)*. (2013). Available online at: http://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp (accessed October 1, 2020).
60. Galovski T, Iverson, K. *Lifetime Trauma Interview for Intimate Partner Violence Survivors*. Boston, MA: Women's Health Sciences Division of the National Center for PTSD, VA Boston Healthcare System (2019).
61. Smith PH, Earp JA, DeVellis R. Measuring battering: development of the Women's Experience with Battering (WEB) Scale. *Women's Health*. (1995) 1:273–88. doi: 10.1037/t02783-000
62. Hegarty K, Sheehan M, Schonfeld C. A multidimensional definition of partner abuse: development and preliminary validation of the Composite Abuse Scale. *J Family Violence*. (1999) 14:399–415. doi: 10.1023/A:1022834215681
63. Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The revised conflict tactics scales (CTS2) development and preliminary psychometric data. *J Family Issues*. (1996) 17:283–316. doi: 10.1177/019251396017003001
64. Bernstein DP, Fink L, Handelsman L, Foote J, Lovejoy M, Wenzel K, et al. Initial reliability and validity of a new retrospective measure of child abuse and neglect. *Am J Psychiatry*. (1994) 151:1132–6. doi: 10.1176/ajp.151.8.1132
65. Foa EB, Ehlers A, Clark DM, Tolin DF, Orsillo SM. The posttraumatic cognitions inventory (PTCI): development and validation. *Psychol Assess*. (1999) 11:303. doi: 10.1037/1040-3590.11.3.303
66. Cicerone KD, Kalmar K. Persistent postconcussion syndrome: the structure of subjective complaints after mild traumatic brain injury. *J Head Trauma Rehabil*. (1995) 10:1–17. doi: 10.1097/00001199-199510030-00002
67. Buysse DJ, Reynolds CF III, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res*. (1989) 28:193–213. doi: 10.1016/0165-1781(89)90047-4
68. Lovibond SH, Lovibond PF. *Manual for the Depression Anxiety Stress Scales*. Sydney: Psychology Foundation of Australia (1996). doi: 10.1037/t01004-000
69. Keller S, Bann CM, Dodd SL, Schein J, Mendoza TR, Cleeland CS. Validity of the brief pain inventory for use in documenting the outcomes of patients with noncancer pain. *Clini J Pain*. (2004) 20:309–18. doi: 10.1097/00002508-200409000-00005
70. Spielberger C. *State-Trait Anger Expression Inventory Research Edition [Computer Software Manual]*. Odessa, FL: Psychological Assessment Resources (1988).
71. Frisch MB. Quality of life assessment/intervention and the quality of life inventory. In: Maruish ME, editor. *The Use of Psychological Testing for Treatment Planning and Outcomes Assessment*. Mahwah NJ: Lawrence Erlbaum (1999). p 1277–331.
72. Diener ED, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Personal Assess*. (1985) 49:71–5. doi: 10.1207/s15327752jpa4901_13
73. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström test for nicotine dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict*. (1991) 86:1119–27. doi: 10.1111/j.1360-0443.1991.tb01879.x
74. Üstün TB, Kostanjesek N, Chatterji S, Rehm J. *Measuring Health and Disability: Manual for WHO Disability Assessment Schedule (WHODAS 2.0)*. Geneva: World Health Organization (2010).
75. Newman CW, Weinstein BE, Jacobson GP, Hug GA. The Hearing Handicap Inventory for Adults: psychometric adequacy and audiometric correlates. *Ear Hear*. (1990) 11:430–3. doi: 10.1097/00003446-199012000-00004
76. Newman CW, Jacobson GP, Spitzer JB. Development of the tinnitus handicap inventory. *Arch Otolaryngol*. (1996) 122:143–8. doi: 10.1001/archotol.1996.01890140029007
77. Yardley L, Masson E, Verschuur C, Haacke N, Luxon L. Symptoms, anxiety and handicap in dizzy patients: development of the vertigo symptom scale. *J Psychosomat Res*. (1992) 36:731–41. doi: 10.1016/0022-3999(92)90131-K
78. Jacobson GP, Newman CW. The development of the dizziness handicap inventory. *Arch Otolaryngol*. (1990) 116:424–7. doi: 10.1001/archotol.1990.01870040046011
79. Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. *The clinician-administered PTSD scale for DSM-5 (CAPS-5)*. Available online at: www.ptsd.va.gov (accessed October 1, 2020).

80. Weathers FW, Bovin MJ, Lee DJ, Sloan DM, Schnurr PP, Kaloupek DG, et al. The Clinician-Administered PTSD Scale for DSM−5 (CAPS-5): development and initial psychometric evaluation in military veterans. *Psychol Assess*. (2018) 30:383–95. doi: 10.1037/pas0000486
81. First MB, Williams JBW, Karg RS, Spitzer RL. *Structured Clinical Interview for DSM-5—Research Version (SCID-5 for DSM-5, Research Version; SCID-5-RV)*. Arlington, VA: American Psychiatric Association (2015), 1–94.
82. Tolin DF, Gilliam C, Wootton BM, Bowe W, Bragdon LB, Davis E, et al. Psychometric properties of a structured diagnostic interview for DSM-5 anxiety, mood, and obsessive-compulsive and related disorders. *Assessment*. (2018) 25:3–13. doi: 10.1177/1073191116638410
83. Williams JB, Gibbon M, First MB, Spitzer RL, Davies M, Borus J, et al. The Structured Clinical Interview for DSM-III—R (SCID): II. Multisite test-retest reliability. *Arch Gen Psychiatry*. (1992) 49:630–63. doi: 10.1001/archpsyc.1992.01820080038006
84. Bailes JE, Cantu RC. Head injury in athletes. *Neurosurgery*. (2001) 48:26–46. doi: 10.1227/00006123-200101000-00005
85. Statements Qualifying. VA/DoD clinical practice guideline for management of concussion/mild traumatic brain injury. *J Rehabil Res Dev*. (2009) 46. Available online at: https://www.healthquality.va.gov/guidelines/rehab/mtbi/mtbicpgfullcpg50821816.pdf (accessed October 1, 2020).
86. Wechsler D. *Wechsler Test of Adult Reading: WTAR*. New York, NY: Psychological Corporation (2001).
87. Whitney KA, Shepard PH, Williams AL, Davis JJ, Adams KM. The Medical Symptom Validity Test in the evaluation of Operation Iraqi Freedom/Operation Enduring Freedom soldiers: a preliminary study. *Arch Clin Neuropsychol*. (2009) 24:145–52. doi: 10.1093/arclin/acp020
88. Rosenberg M, Noonan S, DeGutis J, Esterman M. Sustaining visual attention in the face of distraction: a novel gradual-onset continuous performance task. *Attention Percep Psychophys*. (2013) 75:426–39. doi: 10.3758/s13414-012-0413-x
89. Delis DC, Kaplan E, Kramer JH. *Delis-Kaplan Executive Function System (D-KEFS) Examiner's Manual*. San Antonio, TX: The Psychological Corporation (2001). p. 1–218.
90. Bechara A, Damasio AR, Damasio H, Anderson SW. Insensitivity to future consequences following damage to human prefrontal cortex. *Cognition*. (1994) 50:1–3. doi: 10.1016/0010-0277(94)90018-3
91. Delis DC, Freeland J, Kramer JH, Kaplan E. Integrating clinical assessment with cognitive neuroscience: construct validation of the California Verbal Learning Test. *J Consult Clin Psychol*. (1988) 56:123. doi: 10.1037/0022-006X.56.1.123
92. Gershon RC, Wagster MV, Hendrie HC, Fox NA, Cook KF, Nowinski CJ. NIH toolbox for assessment of neurological and behavioral function. *Neurology*. (2013) 80:S2–6. doi: 10.1212/WNL.0b013e3182872e5f
93. McGlinchey RE, Milberg WP, Fonda JR, Fortier CB. A methodology for assessing deployment trauma and its consequences in OEF/OIF/OND veterans: the TRACTS longitudinal prospective cohort study. *Int J Methods Psychiatr Res*. (2017) 26:e1556. doi: 10.1002/mpr.1556

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

SYSTEMATIC REVIEW
published: 26 May 2021
doi: 10.3389/fpsyt.2021.655130

Coping With the Experiences of Intimate Partner Violence Among South African Women: Systematic Review and Meta-Synthesis

Yalda Sere[1]*, *Nicolette V. Roman*[2]* and *Robert A. C. Ruiter*[1]*

[1] Department of Work and Social Psychology, Faculty of Psychology and Neuroscience, Maastricht University, Maastricht, Netherlands, [2] Centre for Interdisciplinary Studies of Children, Families and Society, Faculty of Community and Health Sciences, University of the Western Cape, Bellville, South Africa

OPEN ACCESS

Edited by:
Haim Y. Knobler,
Hebrew University of Jerusalem, Israel

Reviewed by:
Janina Isabel Steinert,
Technical University of Munich, Germany
Elizabeth Thomas,
Monash Alfred Psychiatry Research Centre, Australia

***Correspondence:**
Yalda Sere
yld.sere@gmail.com
Nicolette V. Roman
nroman@uwc.ac.za
Robert A. C. Ruiter
r.ruiter@maastrichtuniversity.nl

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: 18 January 2021
Accepted: 24 March 2021
Published: 26 May 2021

Citation:
Sere Y, Roman NV and Ruiter RAC (2021) Coping With the Experiences of Intimate Partner Violence Among South African Women: Systematic Review and Meta-Synthesis. Front. Psychiatry 12:655130. doi: 10.3389/fpsyt.2021.655130

Background: Intimate partner violence (IPV) continues to be a serious problem worldwide. South Africa has a high prevalence of women experiencing IPV. Although much research reports on the prevalence rates, risk factors, and consequences of IPV, fewer studies report on how women deal with the experiences of IPV.

Objective: This systematic review of the empirical literature aimed to identify and synthesize the best available evidence on women's experiences of coping with IPV in South Africa.

Methods: A four-level search and retrieval strategy using PRISMA and JBI guidelines was conducted, which included critical appraisal, study selection, data extraction, and data synthesis. Ten studies met the eligibility criteria and were included in the review. They were assessed to meet a set threshold (7/10) based on the JBI Critical Appraisal Checklist for Qualitative Research. All studies were conducted between 2010 and 2020, conducted in South Africa, and used qualitative methodologies to accomplish the overall aim of investigating IPV experiences of women and their responses to it.

Results: The total number of women included in the studies was 159. The data extraction yielded 49 findings of which 47 were aggregated into 14 categories and three themes: (1) help- and support-seeking coping, (2) emotional regulation coping, and (3) problem avoidance and distraction coping. Help- and support-seeking coping refers to women's responses when they seek instrumental aid, advice, comfort, and/or understanding from others. Emotional regulation includes responses of women in which their emotions were expressed or regulated. Problem avoidance and distraction coping represent responses of women in which they take efforts to avoid thinking about the problem situation and rather reshift their focus.

Conclusion: Overall, this review found that a variety of coping responses are used by South African women experiencing IPV. The findings point to the need for understanding IPV and responses to it within a broader social context rather than just at the personal

level. Approaching IPV at many levels may lead to a change in societal norms, better access to and delivery of services to IPV survivors, more functional family affairs, and personal well-being and improved quality of life.

Keywords: intimate partner violence, coping, coping responses, mental health, violence, women, systematic review, South Africa

INTRODUCTION

Intimate Partner Violence

Violence against women is historical, threatens the lives of women, and violates women's human rights. It cuts across nations, cultures, religion, and class and continues to this day. Although the majority of countries in the world have made violence against women a criminal act with societies at large condemning it, it continues to be a critical global problem. Most of this violence is intimate partner violence (IPV), defined as the experience of sexual, physical, or psychological harm by a current or former partner (1). Worldwide, approximately one-third (30%) of women who have been in a relationship state that they experienced some form of physical and/or sexual violence by their intimate partner in the course of their life (1). The consequences of IPV are negative, transcending health, social, and economic outcomes and include adverse well-being, employment, intergenerational impacts, and intrahousehold relations of women (2). The complex and multifaceted health consequences of IPV include physical, mental, sexual, and reproductive health issues, which, in turn, have implications for women's morbidity as well as mortality (1). At least one in seven homicides worldwide and more than a third of female homicides are committed by an intimate partner (3). One may differentiate between direct and indirect pathways through which IPV affects women's health. The former broadly includes injury, chronic pain, hypertension, sexually transmitted diseases, miscarriages, premature birth, and death (2). The latter includes psychological and physical stress, anxiety, trauma, reduced social functioning, and substance abuse (2). A multi-country study conducted by WHO (4) reported that emotional distress, suicidal thoughts, and attempted suicide were significantly higher among women who had experienced IPV compared with those who had not. Numbers of fatalities as a result of IPV are also very large. Moreover, IPV not only affects women, but all members of the family, which highlights the notion of treating violence in the family as a holistic phenomenon (5). UNICEF (6) estimates that worldwide 275 million children are exposed to domestic violence by either witnessing IPV and/or experiencing violence themselves.

South Africa is one of the highest-ranking countries in IPV prevalence with studies recording rates from 20% to 50% in which women report having experienced IPV at some point in their lives (7–9). IPV constitutes the second highest burden of disease in South Africa after HIV/AIDS (10). Accordingly, South Africa has among the highest reported femicide rates in the world with a femicide rate four times higher than the global rate (10, 11). Consequences of IPV are profound and far-reaching for South African women, including health, social, and economic effects. Research has shown that woman who experience IPV have increased risks for suffering adverse health outcomes (12), are more likely to attempt suicide (13), and are more likely to become infected by HIV than their counterparts in nonviolent relationships (14). Even though South Africa has recognized IPV as a punishable criminal offense since 1998 (15), it nonetheless remains among the highest ranking countries internationally in IPV prevalence as well as femicide (11).

Coping With Intimate Partner Violence

Together with the importance of learning about IPV prevalence, consequences, and risk factors lies the significance of understanding how women respond to the violence they experience. Women may experience the same kind of violence, but the consequences in terms of mental and physical well-being may be different. One way to argue for such differences may be the way individuals cope with the incident(s), i.e., their coping strategies/mechanisms. Coping mechanisms have the potential to alter the impact of IPV on survivor's well-being (16). The strategies adopted by the survivor can either maintain well-being and, hence, mitigate the impact of IPV or expose her to greater degrees of risk. Examining coping strategies, therefore, is essential.

One of the most prominent conceptualizations of coping is presented by Lazarus and Folkman (17). They describe coping as thoughts and behaviors that people use to manage the internal and external demands of situations that are appraised as stressful (18). Further, a distinction is made between emotion- and problem-focused coping. Whereas, the former refers to regulating the distress connected to the particular problem and, thus, perceiving the situation as unchangeable, the latter refers to using strategies that manage the particular problem and, thus, perceiving the situation amenable to change (19). Another division frequently stated in the coping literature is the one between coping styles with an adaptive/healthy nature and those of a maladaptive/unhealthy nature (19). However, there is great difference in study findings when it comes to categorizing coping behaviors as either adaptive or maladaptive. This mainly depends on the type of stress or problem studied, the intensity and frequency of the problem, the study population, and cultural factors.

Globally, many researchers have addressed the coping responses of women experiencing IPV. Findings of these studies suggest that women use many coping strategies to manage substantial stress (20), escape reality (21), leave the violence in their lives (20), and establish safety for themselves (22). To identify coping responses that are mostly and rarely used, a systematic review was conducted by Rizo, Givens, and Lombardi

(20) that examined 48 papers of studies conducted among female U.S. citizens. The authors found that the most common forms of coping included religious or spiritual coping, resisting the abuser, wishful thinking, trying to become more independent, maintaining relationships with others, and talking to others as well as leaving the abuser. Among the least commonly used coping responses were substance abuse, self-criticism, legal services, and seeking formal support (police, medical personnel, or a counselor). The participants in this study also rated the more frequently used coping responses as more helpful than the less frequently used coping responses. Contrary to the helpfulness ratings found in the described review, research and experts agree that seeking help from formal as well as informal sources constitutes an adaptive coping strategy (19, 23, 24). Additionally, hope, spirituality, and humor were found to be adaptive coping responses (24, 25). In contrast, substance abuse is considered a maladaptive coping response and may result in poorer health outcomes for the person (19, 24). Other maladaptive coping responses include mental disengagement, denial, and avoidance (19, 24, 25).

It is furthermore noteworthy to mention that factors such as age, ethnicity, employment, geographical location, and culture should not be disregarded in the discussion about coping. They all may play a role in the resources available to a woman and the coping responses she uses. Indeed, research regarding the socioeconomic status (SES) of IPV survivors has shown, for example, that IPV and poverty create parallel effects and constrain coping mechanisms (26). Both poverty and IPV elicit stress, powerlessness, and social isolation, which may evoke posttraumatic stress disorder (PTSD) and depression as well as other emotional problems. In turn, these factors inhibit the person to seek help. Another example regarding one's geographical location and culture is reported by Horn (27), who indicates that access to services in rural areas is limited and that access to services may be more difficult due to governmental policies and societal norms. Thus, a woman's coping response to the violence she experiences depends also on the options available to her. Differences in culture with respect to environmental demands, social structure, resources, and cultural norms may also influence coping strategies. A review conducted by See and Essau (28) found that there is a stronger tendency for collectivistic countries toward emotion-focused coping in comparison to individualistic (Western) countries.

The Current Study

The aim of the present study is to provide a comprehensive systematic review and synthesis of the available literature on women's experiences of coping with IPV in South Africa. We focus on both adaptive and maladaptive coping in this review. The feminist theory and the social-ecological framework serve as theoretical frameworks to understand IPV and its causes, risk factors, and coping responses. Whereas, a growing body of research has examined the prevalence rates that different forms of IPV have and risk factors associated with them, rather little research has examined the strategies survivors have used to cope with the violence, especially in the South African context. Much of our understanding of coping is based mainly on Western cultures (28). However, as South Africa has among the highest rates of IPV globally, it is essential to have a closer look at the coping strategies in this country as well. Thus, this review aims to establish filtered evidence comprising high-quality qualitative studies that explore the coping experiences of women facing IPV in South Africa. The focus of the current study on only qualitative studies lies in the exploratory nature of qualitative research. An initial search of studies revealed that there has been no other systematic review conducted on this topic in the South African context. Therefore, there is a lack of filtered studies, both quantitative and qualitative, whose methodologies have not been rigorously and systematically evaluated along specified criteria. Together with insufficient filtered literature as well as considerable ambiguity about the topic, it is difficult to understand and sufficiently address how women respond to violence in South Africa. Investigating what is known so far qualitatively about coping with IPV may be useful for informing future quantitative research aimed at assessing effective ways of how women deal with the aftermath of violence. Further, a systematic analysis of the qualitative evidence may be important for the careful and detailed development of interventions and programs at the level of individual beliefs and influences from social and physical environments in which South African women live.

MATERIALS AND METHODS

The study utilizes a systematic review methodology. Systematic reviews are defined by collecting all possible studies related to a given topic and design and reviewing and analyzing their results (29). They aim to provide a comprehensive and unbiased synthesis of "all" evidence about a particular question in a standardized, systematic way (30). The systematic review is carried out by taking into account the recommendations by PRISMA and guidelines of the JBI Manual of Systematic Reviews of qualitative evidence.

Search Strategy

A search strategy was designed using the population, exposure, and outcome (PEO) framework. The population of interest were South African women experiencing IPV. Hence, the exposure constitutes experiencing IPV. Last, the outcome refers to coping with IPV. The PEO framework, thus, yielded the following research question: What are the coping strategies used by South African Women experiencing IPV?

The following electronic databases were searched to identify potential studies: Web of Science (WoS), PubMed, EBSCOhost, and Google Scholar. Although the first three databases were searched on the same date (May 18, 2020), the fourth was searched 4 days later (May 22, 2020). The databases yielded 735 hits in total of which 334 were generated by WoS, 247 by PubMed, 13 by EBSCOhost, and 141 by Google Scholar using the following key terms and Boolean strings: intimate partner violence OR domestic violence OR partner abuse AND coping OR coping strategy OR responses OR coping mechanism OR experience AND South Africa. The specific search strings matching the database are displayed in **Appendix 1**.

Inclusion and Exclusion Criteria

To identify and select the studies most relevant to the present review, inclusion and exclusion criteria were established. Inclusion criteria were (i) the paper focused on qualitative data, including but not restrictive to designs, such as phenomenology, feminist research, and discourse analysis; (ii) the paper explicitly included or discussed women above the age of 18 who had personally experienced IPV; and (iii) papers were conducted between 2010 and 2020. Exclusion criteria were (i) the paper was in a non-English language, (ii) the study was not conducted in South Africa, and (iii) papers were not conducted in the designated time frame.

Study Selection

Out of the 735 hits yielded by the databases, potential titles were screened in each database, resulting in 20 studies (WoS = 5, PubMed = 7, EBSCOhost = 2, and Google Scholar = 6). Additional studies were identified from the reference list of all articles considered. The title search of the reference lists yielded five potential studies. Abstracts of 25 studies were screened for further inclusion by means of meeting the abovementioned inclusion as well as exclusion criteria of the study. This led to 12 articles being excluded after evaluation of the abstract. The remaining 13 records were retrieved for a full text review also with regards to the inclusion and exclusion criteria. Three articles were excluded in this step due to one article having the wrong study design, another having an ineligible population, and one for not focusing on the phenomena of interest. This process led to a final selection of 10 included studies to be assessed for methodological quality. The PRISMA flow chart in **Figure 1** shows the selection process of the included studies.

Quality Assessment

The methodological quality of the studies was assessed using the JBI Critical Appraisal Checklist for Qualitative Research (32), and ratings were conducted by two researchers for all articles (double coding). Disagreements in ratings were discussed until consensus was reached. The JBI Critical Appraisal Checklist offered a framework for assessing the quality of the potential studies by addressing different aspects of the research. Ten questions regarding ethics, possible biases, the integrity of the methodology and congruity between methods, results, and conclusion were rated. The researchers set a threshold score (7/10) to determine whether a study should be further included in the review or not. Out of the 10 methodological assessment questions, seven had to be met with a "yes" (as opposed to "no" or "unclear") to be included in the final level. **Table 1** shows the critical appraisal of the included studies. Decisions about the cutoff score for exclusion were made in advance and agreed upon as suggested by the JBI manual. All studies that met the designated threshold score were next subjected to the data extraction process using the standardized JBI Qualitative Assessment and Review Instrument (JBI-QARI) (32). The QARI tool provides a structured data extraction sheet to promote the extraction of similar data across all of the included studies as well as another extraction sheet for extracting findings and their credibility (32). The first extraction tool includes specific details about the populations, context, culture, geographical location, study methods, and phenomena of interest relevant to the review question. **Table 2** shows this extraction for all the included studies. The second extraction tool in regard to findings and their credibility is explained below.

According to the abovementioned methodological assessment, a total of 10 studies were recognized as appropriate for the purpose of the current study and were included in the final review to address the objectives and research question of the present study. For the data extraction, each of the 10 identified studies were coded in a preformulated data extraction sheet according to the following characteristics: first author name, year conducted, methodology, methods, setting, phenomena of interest, data analysis, and the authors' conclusion. Next, findings of each included study were described in a consistent manner to synthesize and interpret them at a later stage. A level of "credibility" was given to each finding based on the amount of support presented by each illustration of the finding. As described by the standardized JBI qualitative extraction tool the below presented levels were given. A full list of findings along with illustrations and levels of credibility are presented in **Appendix 2**.

- Unequivocal (U): the findings' accompanied illustration is not open for challenge.
- Credible (C): the findings' accompanied illustration is open for challenge.
- Unsupported (US): the finding is not supported by data.

The ConQual Approach

The ConQual approach, also called "summary of findings" is a systematic method to consider what increases or decreases confidence in the results of the qualitative studies (43). This depends on the type of the research, the dependability of the study, and the credibility of findings. The analysis of these criteria results in a ConQual score (high, moderate, low, and very low). The analysis starts off by pre-ranking the papers from (1) high, (2) moderate, or (3) low to (4) very low. In this pre-ranking, qualitative studies are considered high, and text and opinion papers are ranked low (32). From this starting point, each paper is then graded for dependability and next for credibility. Depending on the specific criteria for both dependability and credibility, the initial ranking either stays the same or moves down to one or more levels.

Dependability is measured by asking questions regarding the appropriateness of the conduct of the research. Questions two, three, four, six, and seven of the abovementioned JBI Critical Appraisal Checklist are asked (see **Table 1**). If four to five "yes" responses are given, the initial ranking of the paper remains the same. Two to three "yes" responses lead to moving down one level in the ranking. Zero to one "yes" responses lead to moving down two levels in the ranking. Credibility is measured by cross-checking how many findings of which level of credibility (unsupported, credible, and unequivocal) were included in the categories associated with the synthesized finding. If a synthesized finding consists of only unequivocal findings, the ranking (yielded in the dependability analysis) remains unchanged. However, if a synthesized finding consists of a mix of unequivocal and credible findings, only credible, or a mix of credible and not supported findings or, last, of only not supported

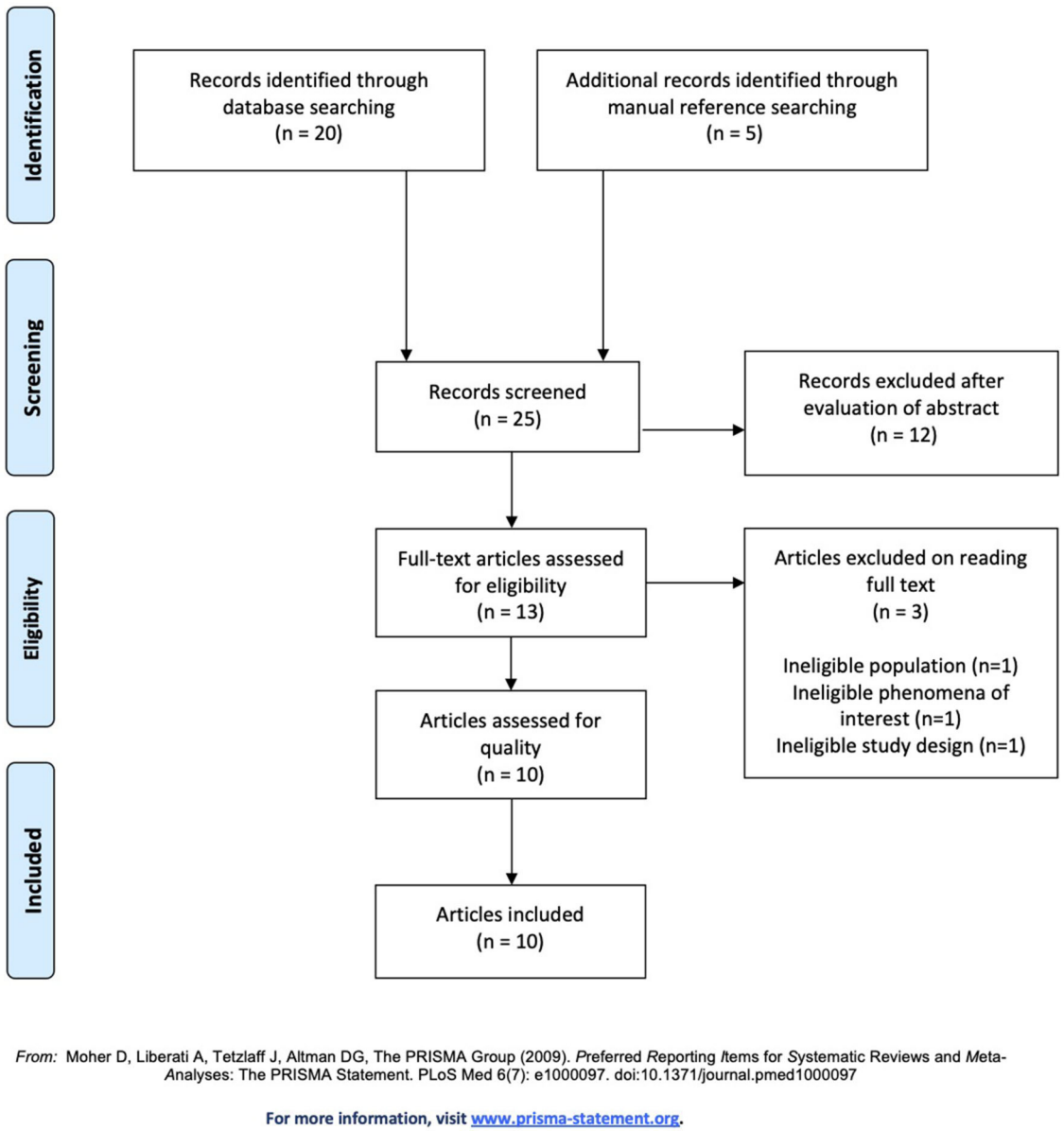

FIGURE 1 | PRISMA flow diagram (31).

findings, the ranking (yielded in the dependability analysis) is downgraded accordingly (−1, −2, −3, and −4).

All included studies were of qualitative design and, therefore, received an initial ranking of "high." For all three synthesized findings, the majority of the included studies received two to three "yes" responses on the ConQual identified criteria for dependability; therefore, the ranking moved down to one and yielding a "moderate" level of confidence. Credibility levels of the second and third synthesized findings were downgraded one level due to a mix of unequivocal and credible ratings, and the first synthesized finding remained unchanged due to only unequivocal ratings. The so-called summary of findings can be seen in **Table 3**.

Data Analysis

The research findings were pooled by means of the meta-aggregation approach described by the JBI Manual of Systematic Reviews of Qualitative Evidence (32). It involves a three-step process of data synthesis described below:

- Findings extraction from all included papers with an accompanying illustration and assigned credibility level for each finding.
- Categorization of findings based on similarity in meaning and concepts.
- Development of a comprehensive set of aggregated findings (of at least two categories) that could be used as a basis for evidence-based practice.

TABLE 1 | Critical appraisal of included studies.

Included studies	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Sum
Slabbert (33)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	8/10
Maselesel (34)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	8/10
Van der Merwe and Swartz (35)	U	Y	Y	Y	Y	N	N	Y	Y	Y	7/10
Rasool (36)	Y	Y	Y	Y	Y	U	U	Y	N	Y	7/10
Mkhonto et al. (37)	U	Y	Y	Y	Y	Y	N	U	Y	Y	7/10
Boonzaier et al. (38)	Y	Y	Y	Y	Y	N	N	Y	N	Y	7/10
Baholo et al. (39)	U	Y	Y	Y	Y	N	Y	Y	Y	Y	8/10
Rasool (40)	Y	Y	Y	Y	Y	Y	N	Y	N	Y	8/10
Dekel and Andipatin (41)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	8/10
Chikwira (42)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	8/10

N, No; U, Unclear, Y, Yes.

Criteria for the critical appraisal of qualitative evidence:

Q1 = Is there congruity between the stated philosophical perspective and the research methodology?

Q2 = Is there congruity between the research methodology and the research question or objectives?

Q3 = Is there congruity between the research methodology and the methods used to collect data?

Q4 = Is there congruity between the research methodology and the representation and analysis of data?

Q5 = Is there congruity between the research methodology and the interpretation of results?

Q6 = Is there a statement locating the researcher culturally or theoretically?

Q7 = Is the influence of the researcher on the research, and vice-versa, addressed?

Q8 = Are participants, and their voices, adequately represented?

Q9 = Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?

Q10 = Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

The synthesized findings were evaluated with the abovementioned ConQual approach as presented in JBI's Manual to establish a level of confidence in each synthesized finding (**Table 3**).

Meta-Synthesis

For each included study, findings were extracted using the extraction sheet of the abovementioned JBI-QARI. The findings were extracted with an illustration from the original data and assigned a level of credibility. A finding is defined as a literal extract of the authors analytic interpretation, which is supplemented by either a participant's voice or other data (32). Accordingly, an unequivocal finding is accompanied by an illustration that demonstrates the authors interpretation beyond doubt. A credible finding is also underpinned with an illustration; however, the two lack clear association, and the interpretation of the author can be challenged. An unsupported finding is not demonstrated with any illustration (32). In this review, only unequivocal and credible findings have been included in the synthesis of data as recommended by the JBI manual.

Hence, each finding of the studies was assigned a credibility level and supported by at least one illustration from the study. For example, finding 7 was *Alcohol as a Coping Mechanism.* This was supported by two illustrations from the study as follows: "I take a doppie. That's how I cope." (participant X) or "You take a doppie and dance just to try to get through life and to forget the pain." (participant Y) (33). Both illustrations support the authors' finding and present a minimal risk of misinterpretation; thus, they were considered to be unequivocal. In total, 49 findings were found, and the same process as described was followed. A small majority (25) of the findings (51%) were unequivocal (U), 22 (45%) credible (C), and two (4%) unsupported (US). As JBI does not recommend the inclusion of unsupported findings, the two unsupported findings were not included in the next stages of the meta-synthesis. A full list of findings accompanied by illustrations can be found in **Appendix 2**. The 49 findings were repeatedly read and reread to compare and identify similarities between them. Those found to be similar were aggregated into 14 categories, namely (1) children, (2) religion, (3) harmful substance use, (4) informal support, (5) formal support, (6) self-blame, (7) love, (8) hope, (9) anger/fight, (10) dissociation, (11) internalizing harmful gender roles, (12) normalization and minimization, (13) acceptance, and (14) no category. A full list of findings and categories is presented in **Appendix 3**. The categories were further examined to identify if they could be synthesized according to similarity in meaning and grouped into themes. This process was done using the thematic analysis defined by Braun and Clarke, which covers six phases: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and writing the report (44). In this review, a synthesized finding or theme includes at least three findings that are similar in meaning. The synthesis of the findings into categories yielded the following three themes: (1) help- and support-seeking coping, (2) emotional regulation coping, and (3) problem avoidance and distraction coping.

RESULTS

Study Characteristics

All 10 studies included in the present review were conducted between 2010 and 2020, conducted in South Africa, and used a qualitative design. Six studies were conducted in the

TABLE 2 | Data extraction.

Reference	Methodology	Method	Setting/country	Participants	Phenomena of interest	Data analysis	Phenomena of interest
Slabbert (33)	Phenomenology	Semi-structured in-depth interviews	Four interviews were conducted in "the Wimpy," five in the researcher's car, nine at the clinic, two at a psychologist's office, Cape Town, SA	20 adult women	Coping mechanisms and resources of abused women	Thematic analysis	Five coping strategies (strengths) found: 1) Children 2) Religion 3) Hope 4) Survivor 5) Alcohol Three coping resources: 1) Significant others (family, friends, and neighbors) 2) Church (pastor, church members) 3) Professional help (social worker, clinic sister, and psychologist)
Maselesel (34)	Phenomenological, qualitative, descriptive	Phenomenological Interviews	Interviews were held in a private place	18 adult women	Women's experiences of coping with domestic violence	Thematic analysis	There are six stages of coping: 1) Self-blame/denial 2) Apathy 3) Uncertainty 4) Acceptance 5) Anger and retaliation 6) Self-discovery
Van der Merwe and Swartz (35)	Qualitative	Semi-structured interview	A shelter for female survivors of IPV in Maneberg, Cape Town, SA	4 adult women	Experiences of IPV	Narrative analysis	Coping: - Religion - Support from family - Counseling - Substance abuse
Rasool (36)	Feminist research	In-depth interviews	Conducted in abused women's shelters in Cape Town and Johannesburg, SA	17 adult women	Love as a central factor in the experience of IPV	Life-history analysis	Love is a powerful reason that keeps women trapped in abusive relationships. Abused women stay because their partners are not abusive all of the time and in some instances are able to display caring and loving behaviors
Mkhonto et al. (37)	Qualitative	In-depth semi-structured interviews	Interviews done in an admission ward at the medico-legal/crisis center of a public hospital in Tshwane, SA	10 adult women	Experiences of women on IPV	Content analysis	Coping mechanisms: 1) Internal motivation 2) Spirituality 3) Children
Boonzaier et al. (38)	Discourse analysis	Semi-structured and unstructured face to face interviews	Urban (29) and semi-rural (15) areas of Cape Town, SA	44 adult women	Women's strategies on telling about IPV experience	Thematic narrative analysis	Women fight back; Women have their internalized roles (good wives, mothers, homemakers) they want to keep
Baholo et al. (39)	Qualitative	In-depth face to face interviews	All interviews took place in an abused women's shelter in a private room Gauteng Province, SA	11 adult women, 10 of African descent, and 1 of Indian descent	Women's experiences facing IPV	Thematic analysis	A phase of change (progression of violence, realization the partner would not change, the effect of abuse on the children and the women's own feelings due to abuse) and the process of leaving the abusive relationship (a supportive environment, access to shelter, opportunity to leave)

(Continued)

TABLE 2 | Continued

Reference	Methodology	Method	Setting/country	Participants	Phenomena of interest	Data analysis	Phenomena of interest
Rasool (40)	Feminist research	In-depth interviews	Interviews were conducted in domestic violence shelters in JHB and Cape Town, SA	17 adult women	Women's experiences of help-seeking	Content analysis	Influences of powerful social discourses on the best interest of the child
Dekel and Andipatin (41)	Feminist poststructuralism and discourse analysis	Open-ended interviews	Interviews were held in private rooms of an abused women's shelter in Cape Town, SA	7 adult women	Experiences of women survivors of IPV	Discourse analysis	Women drew on discourses of femininity, romantic love, environmental support, dissociation, normalization, self-blame, and religion to endure
Chikwira (42)	Intersectional analysis	Semi-structured face to face interviews	Interviews were conducted in a room in an abused women's shelter in Cape Town, SA	11 adult women	Life histories of IPV survivors	Thematic narrative analysis	Women cope through minimization and normalization

TABLE 3 | ConQual summary of findings.

Synthesized finding	Type of research	Dependability	Credibility	ConQual score	Comments
Help- and support-seeking coping Women's experiences of IPV led them to seek instrumental aid, advice, comfort, and/or understanding from others. They recognized these people as significantly supportive.	Qualitative- High	Downgraded one (−1)*	No change**	Moderate	*The majority of studies (three out of five) scored three out of five for the questions relating to appropriateness of the conduct of the research; therefore, the dependability score has downgraded one leading to a ranking of moderate. **No change due to only unequivocal (U) findings leading to a final ranking of moderate. U = 10
Emotional regulation coping Women experience a number of emotions as they go through IPV. They take effort keep them under control, let them out, or reconstruct their emotional understanding.		Downgraded one (−1)*	Downgraded one (−1)**	Low	*The majority of studies (six out of seven) scored three out of five for the questions relating to appropriateness of the conduct of the research; therefore, the dependability score has downgraded one leading to a ranking of moderate. **Downgrade one level due to mix of unequivocal (U) and credible (C) findings leading to a final ranking of low. U = 9, C = 7
Problem avoidance and distraction coping Women exposed to IPV take effort to distract themselves, avoid and/or shift their focus on the abusive behavior of their partner.		Downgraded one (−1)*	Downgraded one (−1)**	Low	*The majority of studies (five out of eight) scored three out of five for the questions relating to appropriateness of the conduct of the research; therefore, the dependability score has downgraded one leading to a ranking of moderate **Downgrade one level due to mix of unequivocal (U) and credible (C) findings leading to a final ranking of low. U = 6, C = 10

Western Cape Province (Cape Town), three studies in the Gauteng Province (Johannesburg and Tshwane), and one study in the North West Province (Mafikeng). The total number of participants included in the studies was 159. **Appendix 4** gives an overview of the participants' characteristics. It is noteworthy to mention that the race categories describing the women of the studies originated and developed under Apartheid. Although they are not unproblematic, they are still frequently used today in research. The following characteristics were found for the 10 included qualitative papers. The methods included in this review were phenomenology (two), feminist research (three), discourse analysis (two), and unspecified qualitative (three). All studies focused on solely women's accounts of their experience with IPV, investigating their understanding and responses to it. Five studies specifically investigated coping responses of South African women to deal with IPV. The other five studies aimed to explore the experiences of IPV in general. Among several identified experiences, they also found coping experiences of women dealing with IPV. Interview settings were a private room in abused women's shelter (seven studies), participants' homes

(one study), a private room in a medico-legal/crisis center of a public hospital (one study), or unspecified (one study). Data collection methods used were mainly semistructured or in-depth, face-to-face interviews. Data analysis methods were coherent with the qualitative methodology used in each study.

Themes

Help- and Support-Seeking Coping

Three categories comprising 10 findings were integrated into the first theme, which can be seen in **Table 4**, help- and support-seeking coping. The first category, *informal support*, refers to the people to whom women reach out to find support for their difficult situation. These include family members, friends, and neighbors. Participants found these people to be very supportive as shown with this statement: "My mother is my biggest support. If it was not for her, I would not cope" (33). The second category, *formal support*, refers to professional people to whom women reach out for help, including police officers and counselors. Some women described how the counselor, for example, made them feel stronger ("the counselor has made me stronger" or "my psychologist tells me regularly what a strong woman I am") (33, 35). The last category, *religion*, refers to people in the church, including the pastor as well as church members and also God. Many participants stated how God had helped them cope by, for example, stating "[the Lord] he carries me through this difficulty" (33). All three categories represent a type of response in which women seek instrumental aid, advice, comfort, and/or understanding from others.

Emotional Regulation Coping

The meta-synthesis into emotional regulation coping resulted from five categories, comprising 16 findings that can be seen in **Table 5**. The first category was *love*. Several women in the studies described how, on the one hand, loving their partner had helped them deal with the abuse, and on the other hand, loving behaviors from their abusers helped them get through. Love seemed to be a powerful concept that enforced women to survive their relationship as one woman clearly stated: "He tells me he loves me (...) he was my reason for living (...)." (36). The second category, *self-blame*, refers to women transferring the guilt of the abuse onto themselves. They believe that they are to blame for their partner's violence, either for doing something wrong ("I shouldn't have talked to him") or for choosing the wrong partner ("I always went for men that had the tendency of abusiveness") (34, 42). There were also some women who identified *hope* as a coping mechanism, which formed the third category. Hopes about the abusive relationship becoming "better" as well as hopes about the partner changing were communicated by the women: "I hope that everything will come right. It is hope that lets me go on." (33). The next category, *anger/fight*, refers to women identifying feelings of anger and fighting back as coping with their abuse. Several women expressed how they fought back or how they imagined retaliating their partner ("I wish I could kill him before he kills me") (34). The last category, *acceptance*, refers to those women who communicated enduring the relationship due to their accepting position of the situation ("I made a commitment, I will not go away") (34).

Problem Avoidance and Distraction Coping

Six categories comprising 16 findings were integrated into the last theme of problem avoidance and distraction coping and can be seen in **Table 6**. The first category, *harmful substance use*, refers to women coping with the help of alcohol. Women describe how the use of alcohol made them forget the pain as one participant stated: "You take a doppie and dance just to try to get through life and to forget the pain" (33). The second category, *dissociation*, refers to how women project the partners responsibility of the abuse onto something else, which helped the women to see the abuse and the abuser in a different light. *Internalizing harmful gender roles* formed the third category and refers to women ascribing themselves to different roles. Most women referred to their role as a good wife, mother, and homemaker as the following statement of the participant states: "He needed me to clean him up, take care of him, of his children (…)" (38). Also, societal expectations of how a family should be came up as one woman expressed her concerns for the upbringing of her children in saying: "I didn't want my children growing up without a father" (40). The fourth category, *normalization and minimization*, refers to women downplaying the abuse or evaluating it as normal ("Maybe it should be like that" or "The hitting is not so bad") (41, 42). *Children* formed the fifth category. Here women expressed how their children helped them get through as their love for them inspired them ("It's just my children. I love them very much. They are the reason I am going on") (33). The last category, *motivation,* refers to women motivating themselves in some aspect to cope with their abusive relationship. For example, participant X stated, "I am special (...) I have managed to reach grade 12, there are many chances that I can get so that I become better," or as another woman said: "I will get to the top (…) I am a fighter (...)" (33, 37). All categories represent responses of women in which they take efforts to avoid thinking about the problem situation and rather reshift their focus mostly by using some sort of distraction as well as reorganizing the way they look at the problem situation.

DISCUSSION

Summary of Main Findings

The synthesized findings show that women who experience IPV use a wide variety of coping mechanisms to deal with the violence. Consistent with the prominent conceptualization of Lazarus and Folkmann (17), which reports that coping mechanisms may be problem- or emotion-focused, the current findings also yield problem- and emotion-focused coping strategies with the former referring to responses aimed at changing the problem and the latter to responses aimed at altering the feeling associated with the problem. However, there was a slight tendency toward emotion-focused coping, which aligns with previous research stating that collectivistic countries have stronger tendencies toward emotion-focused coping (28).

Many women in the present study responded to the violence they experienced by seeking help and support from others. Such responses have been linked to problem-focused coping strategies in previous research as they have the potential to alter the problem (19, 45). Previous research has also reported that informal networks were identified by survivors of IPV as

TABLE 4 | Theme 1: Help- and support-seeking coping.

Findings	Categories	Theme
Participants found their family, friends, and neighbors to be very supportive [U]	Informal Support	*Help- and support- seeking coping*
They turned to family and friends during those times when they were desperate for support [U]		
Drawing on police services for help and assistance [U]	Formal Support	
Use of some form of professional [U]		
Coping mechanism included counseling [U]		
Religion is one way of helping them cope with their difficult situations [U]	Religion	
The church was noted as providing support and a way of coping (pastor and members of church) [U]		
Coping mechanism included religion [U]		
Resilient due to their spirituality [U]		
Positioning with religious discourses [U]		

U, Unequivocal.

TABLE 5 | Theme 2: Emotional regulation coping.

Findings	Categories	Theme
Love women feel for the abuser [U]	Love	*Emotional regulation coping*
Abuser displays caring and loving behavior [U]		
Maintain the romantic fairy-tale ideal (love) [C]		
Love influences a woman's commitment to remain in a relationship, albeit an abusive one [U]		
The victim blames herself that she is responsible for the abuse [C]	Self-blame	
She deserves to be treated in that way [C]		
The women tended to blame themselves for their partner's violence, and accepted their partner's blaming of them [U]		
Place blame of experiencing IPV on themselves (self-blame) [C]		
They had hope and identified that as a coping mechanism [U]	Hope	
Hope that relationship will return to a better time [C]		
Participants believed that their partners could change [U]		
Women retaliates and is prepared to fight [U]	Anger/Fight	
Fighting back [U]		
Anger at the abuse [U]		
Victim accepts there is nothing she can do about the abuse [C]	Acceptance	
Enduring the relationship [C]		

U, Unequivocal; C, Credible.

very helpful (23). This is in line with the results of the present review in which women reported to find their family, friends, and neighbors as very supportive. This highlights the important role of community- and interpersonal-level impacts that should be considered in IPV research. It also supports the view that IPV should not be looked at as an individual problem but rather considered a community problem. Women in the present study also reported to have drawn on police services for safety and assistance as well as using counseling sessions by psychologists and social workers. These findings are consistent with other studies identifying formal support as a coping mechanism (19, 46). In addition, the present review found that many women reached out to religious support by consulting pastors and talking to members of the church. They also stated that "God" was a source for coping with abuse. Similarly, previous research has identified religion and spirituality as coping mechanisms of IPV survivors (47).

Together, these findings show that women are not passive survivors but rather active in that they adopt active strategies to ensure their safety and comfort through the help of others. Research often reports that women suffer in silence (48). However, the present findings show that the survivors are not silent, but instead active in sharing their experiences with others as well as seeking out help from others. Another important implication of the findings is to view IPV from many levels (interpersonal, community, and society) instead of perceiving it solely as a personal issue. Understanding IPV only at the personal level can be dangerous as it may contribute to an overall lack of the understanding of survivor's situations. It may also preserve the view that the responsibility of an abuse remains only on women, which, in turn, may perpetuate privatization of abuse. Generally, it is often assumed that the more a society openly addresses an issue at all levels, the more room there is for change. It is an open question if this is also the case in South Africa.

The current review further found that many coping responses of women experiencing IPV involved focusing, expressing, or shifting their emotions. For example, women identified love as a powerful survival strategy. They reported that the love they felt

TABLE 6 | Theme 3: Problem avoidance coping and distraction coping.

Findings	Categories	Theme
Participants indicated that alcohol helped them to forget and to cope [U]	Harmful substance use	*Problem avoidance coping and distraction coping*
She denies that her partner is responsible for his actions [C]	Dissociation	
To cope with the abuser, she finds excuses for her abuse [C]		
Many women dissociate the abuse from the "real man" and attributing it rather to factors that he does not have control over [C]		
Emphasized femininity or good womanhood (role as good wives, mothers, and homemakers) [U]	Internalizing harmful gender roles	
Fulfilling the role of mother [C]		
Internalization of dominant prescriptions of femininity [C]		
Preserving the two-parent family form [C]		
IPV is normalized [U]	Normalization and minimization	
Normalization of IPV [U]		
Minimization of IPV [U]		
Children helped these women to cope [U]	Children	
Their children were their goal in life and helped them go on [C]		
Children as a source of inspiration [C]		
Some abused women are able to identify their own courage, wisdom, and resilience and are able to view themselves as capable human beings [C]	Motivation	
Resilient due to their inherent motivation [C]		

U, Unequivocal; C, Credible.

for their partner kept them going (reason to survive), which also influenced their commitment to stay in the abusive relationship. This is not uncommon as the concept of love has been linked to a woman's decision and process of leaving an abusive partner in previous research. In a study conducted by Copp et al. (49), they found that love was a significant factor that influenced an individual's decision to leave or stay in an abusive relationship. In addition, the present review found that many women blamed themselves for the abuse they were experiencing. Several women reported feeling responsible for their partners' violence. One woman even stated that she deserved to be treated in that way. The concept of self-blame has been identified as a frequent emotion-focused strategy of women experiencing IPV (19, 50). The research also notes that self-blame constitutes a maladaptive strategy as it can increase negative affectivity as well as lack of behavior change. For women survivors of IPV, this may mean not leaving the abuser. Also, self-blaming feelings may contribute to the help-seeking behavior of IPV survivors. Findings of a literature review found that, among others, feelings of self-blame too formed a barrier to seek help from formal as well as informal networks (51). Furthermore, similar to findings identifying hope as an emotion-focused coping strategy, this review also found hope to be a coping mechanism for several women (52). The beliefs included hope about a better relationship in the future as well as hope about a behavior change in their partner. This is an important finding because it shows that, like other emotion-focused coping responses, hope has the potential to shift the negative feelings of women and instead view the relationship in a more positive light. However, women in this study also expressed anger toward their abuser and wishes about fighting back as well as actual fighting back. This is an example of a response in which women actively let their emotion out and let their abuser know about their anger. Similarly, a recently conducted study found that a strategy of women dealing with IPV was the use of self-defense and fighting back, which they further identified as an effective strategy (53). However, although some studies report that fighting back was perceived as effective by IPV survivors, many other studies report that this strategy was identified as extremely ineffective (53). Independent of the effectiveness, the importance of the present finding is that it, once again, shows that women experiencing IPV can show agency and that they are able to defend themselves. It is noteworthy, however, that agency should not solely be measured by a women's capability to fight back as many other factors influence such a decision, and consequences of displaying such a type of agency may result in unimaginable consequences. Some women in this study also reported having accepted their "fate" and decided that there is nothing they can do about the abuse. This finding is consistent with other studies reporting that IPV survivors accepted what happened and what might happen to them (47, 54). This form of response has also been identified as an emotion-focused strategy as it reconstructs the way a person looks at the problem situation rather than addressing the problem itself (19).

The reported findings of the current review highlight that women use a range of emotional coping responses. They express their emotions, keep them under control, and/or reconstruct the way they emotionally understand the problem situation. However, many of the responses, as previous research also shows, are not necessarily effective as they can negatively impact decision making. Yet, it is important to acknowledge the presence of

emotions in survivors' situations and recognize their influence on decision making. This is especially important for organizations providing services to survivors of IPV who rely on the decision-making processes of women.

Many coping responses of women in the present study were characterized by avoidance and distraction, which confirms previous research suggesting that women deal with the violence they experience by avoiding it or distracting themselves (47, 54, 55). A longitudinal study conducted in 2015 found that IPV survivors drank to cope with IPV (56). This finding is reflected in the current review as women identified the use of alcohol as a coping mechanism, which constitutes a maladaptive coping response (19). Moreover, women identified dissociation as a way of coping in that they projected their partners' responsibility for the abuse onto something else. This led to them reorganizing the way they see the abuse and the abuser. Hence, they dissociated the abuse from the "real man" and instead attributed the abuse to factors over which the abuser did not have any control. Women in the present study also ascribed different roles onto themselves. Those roles mostly emphasized femininity or womanhood in the form of being a good wife, mother, and housekeeper. The internalization of such prescriptions was weighted heavier by the women than the abuse they were facing. Also, societal expectations of how a family should look were evident as women expressed their concerns about raising a child without a father and being a single parent. This is in line with studies reporting that women feel a responsibility to maintain the marriage and family and shame associated with being divorced or being unmarried (57). Importantly, these findings suggest that societal norms may result in women enduring IPV silently due to the cultural pressures of preserving the status quo and sustaining a two-parent family form. It is important to note, however, that gender roles are foremost fundamentally a cause of IPV in that they constitute community and societal risk factors of IPV (58). These gender roles influence relationships between men and women. This influence is seen in that violence against women within a couple is being legitimized within the context of adherence to traditional gender norms and roles (59). Such legitimization from the women's perspective can be understood as a form of maladaptive coping (59). Research also suggests that norms facilitate the normalization of IPV (60), which was also evidenced in the present review. Several women stated that IPV was "normal" and just part of life. This finding can be seen as a direct mirror of societal norms accepting and tolerating IPV and considering it a normal, everyday occurrence (61). An important implication of a woman's response around the normalization of IPV is the effect it not only has on herself (staying in the relationship, acceptance of abuse, and barrier to seek help), but also on the community at large. If IPV is seen as normal, no one who is witnessing an incident would intervene (the so-called bystander nonintervention) (62). However, bystanders have the power to weaken perceived norms around the acceptability of IPV (63). Another important finding of the present study was the role children played in women's coping. Although some women expressed how their children helped them cope by being a source of inspiration and, thus, staying in the relationship, others recognized the adverse effects of the abuse on their children's health inspired them to leave the relationship. This points to the possibility that children of IPV survivors give them energy and strength to deal with the difficult situation they are enduring. These findings are consistent with previous literature highlighting the important role of children in the help-seeking behavior of IPV survivors by either contributing to staying in the relationship or leaving (64–66). Last, women in the present review reported motivating themselves as a means to cope with IPV. They mentioned what they had already accomplished so far and what was still out there for them to achieve. They, thus, exhibited resilience through their inherent motivations, which is consistent with literature suggesting that personal qualities are motivators helping individuals survive difficult situations (67, 68). Once again, this implies women's agency and strength in being able to motivate themselves even without external help to survive the pain they are going through.

Limitations

Although this review has systematically evaluated the included studies and comprehensively examined the coping strategies used by women experiencing IPV in South Africa, limitations concerning the search strategies, number of studies, effectiveness of coping responses, and generalizability need to be considered. Further, limitations of the included studies need to be considered. The researcher of this review strived to conduct a systematic search strategy supporting the aims of the review as well as was possible. Even though an electronic search of databases is effective, it may only identify some of the eligible studies. To increase the likelihood of identifying more eligible studies, reference mining was added to the search method. Nonetheless, it cannot be ruled out that eligible studies were not identified and, thus, missed, which forms the first limitation. The second limitation is the small number of only 10 included studies, which concludes that the findings cannot be overgeneralized. This limitation also goes for the included studies as they were all conducted only in South Africa and only with women survivors. Further, this systematic review did not exclusively focus on the effectiveness of each of the coping responses in terms of well-being and helpfulness, which forms another limitation. Although the present review has cited literature that evaluates the mentioned coping responses in terms of their helpfulness, a closer look at coping strategies' effectiveness and their comparison is needed. This should be integrated into future research to see, which coping strategies, in fact, have the potential to mitigate the impact of IPV. Last, readers should note that this study focused solely on experiences of cis-gender women whose relationships were characterized as heterosexual. Thus, experiences of male or LGBTQ survivors of IPV were not included, making generalizability of results not possible, at least for males, non-cis-gender women, and non-heterosexual relationships.

Recommendations

Based on the findings of the present study, the following three recommendations are made. First, agency at a collective level (community and society) needs to be facilitated. Our study

has shown that IPV is a complex, multifaceted phenomenon, which occurs within a social context influenced by many levels. Although it is important for women experiencing IPV to be empowered to facilitate agency at an individual level, the multilevel influence on a woman's experience of IPV demand facilitation at the collective level as well. Facilitators should, for example, address structural barriers encountered by women, which hinder effective responses. The following examples may help in breaking those barriers: (1) Having regular visits and events from different organizations aimed at supporting IPV survivors in different places (to draw attention to an event and the organizations, leaflets could be spread), (2) a police workshop at which experts in the field of IPV and its consequences sit down with different police departments to discuss the issue and how women can more easily reach and talk to the police. Such workshops could be made mandatory. (3) Doctors use a fitted-out van to provide free medical checkups and care in different cities and villages. And, by that, survivors of IPV may be identified and referred for further assistance. Second, beliefs and norms of the society need to be challenged. The findings of the present study have shown that many women had internalized harmful gender roles putting them in subservient positions. They emphasized their duties as a wife and mother as well as their responsibility to keep the family together. Also, they normalized and minimized their experience with abuse. It, thus, seems imperative to start shifting the power balance within the relationship as well as the community, which contributes to those beliefs. The following are some ideas on how to do that: (1) advertisement, for example, portraying strong, self-confident and admirable single mothers in TV, billboards etc. to challenge the current view of a women being dependent on a man; (2) financial support for IPV survivors to also challenge the view of a women being dependent on financial support from a man; (3) fines/punishments for abusers, which are higher than the current ones to target the ineffectual handling of abusers in society today; (4) billboards highlighting the terrible facts about IPV. This may lead to more frequent public talks about the issue and eventually lead to a society that more openly addresses this issue. Last, women's emotions need be integrated in IPV services. Organizations providing services to survivors of IPV should recognize the influence of women's emotions in their decision making. Findings of the present study show that, for example, many women still love the man who is abusing them and feel attached to the life they have together. These factors need to be considered to properly assist women and help them to find their full independence.

Future Research

Based on the findings of this systematic review, future research should address the following. First is the effectiveness of coping responses in terms of well-being. As mentioned above, one limitation of the present review was the in-detail analysis of the effectiveness of each reported coping strategy. However, this may be valuable information as it could inform organizations aimed at supporting survivors of IPV about the coping strategies that are actually helpful and effective. Second, the effectiveness of coping responses in terms of leaving the abuser. Further research may be used to not only examine how particular coping responses enable survivors to cope but also how they facilitate the process of leaving an abusive partner. Last, male and LGBTQ survivors' perspectives of coping experiences should be investigated as their lives and experiences are relevant as well.

CONCLUSIONS

This qualitative systematic review was undertaken to better understand the coping experiences of women survivors of IPV. Ten studies were included in this review after a rigorous search and inclusion process. All included studies were of high quality based on the JBI Critical Appraisal Checklist for Qualitative Research (**Table 1**).

This review identified and provided an understanding of the different kinds of coping mechanisms used by South African women who experience IPV and compared them to available literature. Coping strategies in this study involved help- and support-seeking from others, emotional regulation efforts, and avoidance and distraction. Exploring these coping strategies pointed out the need for understanding IPV and responses to it within a broader context, which involves interpersonal, relationship, and communal as well as societal aspects. Hence, IPV constitutes a complex phenomenon, which is influenced by multiple factors. Although some coping responses are considered by previous literature as effective, others are not. The findings in this review confirm this as each theme had both effective and ineffective strategies. Nevertheless, the authors agree with previous research stating that seeking help and support from others (first theme) is an effective strategy. This also supports the abovementioned notion that IPV should be understood within an ecological system with the different levels involved in not only the emergence and perpetuation of IPV, but also in the resolution. Approaching IPV accordingly can lead to a change in societal norms, better access to and delivery of services to IPV survivors, and more functional family affairs as well as personal well-being and higher quality of life.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

AUTHOR CONTRIBUTIONS

YS, NR, and RR contributed to the conception, design of the review, writing of the paper, and drafting the manuscript. YS and NR contributed to the literature search and analysis as well as the result interpretation. All authors contributed to the article and approved the submitted version.

ACKNOWLEDGMENTS

We would like to thank Lana Tafelski for her support, guidance, and encouragement during this research project.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.655130/full#supplementary-material

REFERENCES

1. World Health Organization. *Violence Against Women.* (2017). Available online at: https://www.who.int/en/news-room/fact-sheets/detail/violence-against-women (accessed December 28, 2020).
2. Duvvury N, Callan A, Carney P, Raghavendra S. *Intimate Partner Violence: Economic Costs and Implications for Growth and Development.* World Bank Res News (2013). Available online at: https://openknowledge.worldbank.org/handle/10986/16697
3. Stöckl H, Devries K, Rotstein A, Abrahams N, Campbell J, Watts C, et al. The global prevalence of intimate partner homicide: a systematic review. *Lancet.* (2013). doi: 10.1016/S0140-6736(13)61030-2
4. World Health Organization. *Global Status Report on Violence Prevention.* (2014). Available online at: https://www.who.int/publications/i/item/9789241564793 (accessed December 28, 2020).
5. Ryan J, Michelle VE, Roman NV. Legislative response to family violence in South Africa: a family centered perspective. *Agress Violent Behav.* (2018) 42:1–8. doi: 10.1016/j.avb.2018.06.009
6. Unicef. *Behind Closed Doors. The Impact of Domestic Violence on Children.* (2006). Available online at: https://www.unicef.org/media/files/BehindClosedDoors.pdf (accessed December 28, 2020).
7. Roman NV, Frantz JM. The prevalence of intimate partner violence in the family: a systematic review of the implications for adolescents in Africa. *Fam Pract.* (2013) 30:256–65. doi: 10.1093/fampra/cms084
8. Shai N J, Sikweyiya Y. Programmes for change: addressing sexual and intimate partner violence in South Africa. *SACQ.* (2015) 51:31–41. doi: 10.4314/sacq.v51i0.4
9. Mpondo F, Ruiter RAC, Reddy PS, van den Borne, B. Intimate partner violence and its association with self-determination needs and gender-power constructs among rural South African women. *J Interpers Violence.* (2016) 34:2975–95. doi: 10.1177/0886260516664316
10. Gordon C. Intimate partner violence is everyone's problem, but how should we approach it in a clinical setting? *SAMJ.* (2016) 106:962–5. doi: 10.7196/SAMJ.2016.v106i10.11408
11. World Health Organization. *Disease Burden and Mortality Rates.* (2016). Available online at: https://www.who.int/healthinfo/global_burden_disease/estimates/en/ (accessed December 28, 2020).
12. Tsai AC, Tomlinson M, ComuladaWS, Rotheram-Borus MJ. Intimate partner violence and depression symptom severity among South African women during pregnancy and postpartum: population-based prospective cohort study. *PLoS Med.* (2016) 13:e1001943. doi: 10.1371/journal.pmed.1001943
13. Gibbs A, Dunkle K, Jewkes R. Emotional and economic intimate partner violence as key drivers of depression and suicidal ideation: a cross-sectional study among young women in informal settlements in South Africa. *PLoS One.* (2018) 13:e0194885. doi: 10.1371/journal.pone.0194885
14. Jewkes RK, Dunkle K, Nduna M, Shai N. Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study. *Lancet.* (2010) 376:41–8. doi: 10.1016/S0140-6736(10)60548-X
15. Mathews S, Abrahams N. *Combining Stories and Numbers: An Analysis of the Impact of the Domestic Violence Act (No. 116 of 1998) on Women.* Gender Advocacy Programme. MRC (2001). Available online at: http://196.21.144.194/gender/domesticviolence.pdf
16. Mengo C, Small E, Black B. Intimate partner violence and women's mental health: the mediating role of coping strategies among women seeking help from the police. *J Interpers Violence.* (2017) 2:28–43. doi: 10.1177/0886260517729402
17. Folkman S, Lazarus RS. *Stress, Appraisal, and Coping.* New York, NY: Springer Publishing Company (1984).
18. Folkman S. Stress, coping, and hope. *Psychooncology.* (2010) 19:901–8. doi: 10.1002/pon.1836
19. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. *J Pers Soc Psychol.* (1989) 56:267. doi: 10.1037/0022-3514.56.2.267
20. Rizo CF, Givens A, Lombardi, B. A systematic review of coping among heterosexual female IPV survivors in the United States with a focus on the conceptualization and measurement of coping. *Agress Violent Behav.* (2017) 34:35–50. doi: 10.1016/j.avb.2017.03.006
21. Carvalho MR, Oliveira JF, Gomes NP, Campos LM, Almeida LC, Santos LR. Coping strategies for domestic violence: testimony of women involved with drugs. *Esc Anna Nery.* (2019) 23:1–7. doi: 10.1590/2177-9465-ean-2018-0291
22. Liang B, Goodman L, Tummala-Narra P, Weintraub S. A theoretical framework for understanding help-seeking processes among survivors of intimate partner violence. *Am J Community Psychol.* (2005) 36:71–84. doi: 10.1007/s10464-005-6233-6
23. Goodman L, Dutton MA, Weinfurt K, Cook S. The intimate partner violence strategies index: development and application. *Violence Women.* (2003) 9:163–86. doi: 10.1177/1077801202239004
24. Obayemi JE, Card EB, Shirima O, Massawe, H, Mandari F, et al. Psychosocial health of patients receiving orthopaedic treatment in northern Tanzania: a cross-sectional study. *Ann Med.* (2020) 50:49–55. doi: 10.1016/j.amsu.2019.10.020
25. Bernardes CM, Ray S, Harkins D. An exploratory study of resilience and coping strategies among Portuguese-speaking immigrant women survivors of domestic violence. *Am J Psychol Res.* (2009) 5:81–96. Available online at: https://www.researchgate.net/publication/253328989
26. Goodman LA, Smyth KF, Borges AM, Singer R. When crises collide: How intimate partner violence and poverty intersect to shape women's mental health and coping? *Trauma Violence Abuse.* (2009) 10:306–29. doi: 10.1177/1524838009339754
27. Horn R. Responses to intimate partner violence in Kakuma refugee camp: refugee interactions with agency systems. *Soc Sci Med.* (2010) 70:160–8. doi: 10.1016/j.socscimed.2009.09.036
28. See CM, Essau CA. *Psychologie-Kultur-Gesellschaf.* Available online at: https://link.springer.com/chapter/10.1007/978-3-531-92212-6_7
29. Ahn E, Kang H. Introduction to systematic review and meta-analysis. *Korean J Anesthesiol.* (2018) 71:103. doi: 10.4097/kjae.2018.71.2.103
30. Aromataris E, Munn Z. Chapter 1: JBI systematic reviews. In: *Joanna Briggs Institute Reviewer's Manual.* (2017). Available online at: https://wiki.jbi.global/display/MANUAL/Chapter$+$1%3A$+$JBI$+$Systematic$+$Reviews
31. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med.* (2009) 6:e1000097. doi: 10.1371/journal.pmed1000097
32. Lockwood C, Porrit K, Munn Z, Rittenmeyer L, Salmond S, Bjerrum M, et al. Chapter 2: Systematic reviews of qualitative evidence. In: *Joanna Briggs Institute Reviewer's Manual.* The Joanna Briggs Institute (2017). Available online at: https://wiki.jbi.global/display/MANUAL/Chapter$+$2%3A$+$Systematic$+$reviews$+$of$+$qualitative$+$evidence
33. Slabbert I. *The Experiences of Low-Income Female Survivors of Domestic Violence.* Dissertation/Master's Thesis, University of Stellenbosch, Stellenbosch (2010).
34. Maselesele MD. Trapped in the cycle of violence: a phenomenological study describing the stages of coping with domestic violence. *J Soc Sci.* (2011) 29:1–8. doi: 10.1080/09718923.2011.11892948
35. Van der Merwe A, Swartz L. Living in two narratives: psychic splitting in South African survivors of chronic trauma. *S Afr J Psychol.* (2015) 45:361–73. doi: 10.1177/0081246315574826

36. Rasool S. Re-constructing discourses of love to facilitate help-seeking after woman abuse. *Agenda.* (2013) 27:56–64. doi: 10.1080/10130950.2013.807041
37. Mkhonto F, Sengane M, Havenga Y. Experiences of women on intimate partner violence in a public hospital in Tshwane, South Africa: gender-based violence. *Afr J Phys Health Educ Recreat Dance.* (2014) 20:333–35.
38. Boonzaier F, Lafrance MN,McKenzie-Mohr S. South African women resisting dominant discourse in narratives of violence. In: Lafrance MN, McKenzie-Mohr S, editors. *Women Voicing Resistance: Discursive and Narrative Explorations.* Fredericton: Routledge Press (2014). p. 102–20.
39. Baholo M, Christofides N, Wright A, Sikweyiya Y, Shai NJ. Women's experiences leaving abusive relationships: a shelter-based qualitative study. *Cult Health Sex.* (2015) 17:638–49. doi: 10.1080/13691058.2014.979881
40. Rasool S. Help-seeking after domestic violence: the critical role of children. *J Interpers Violence.* (2015) 31:1661–86. doi: 10.1177/0886260515569057
41. Dekel B, Andipatin M. Abused women's understandings of intimate partner violence and the link to intimate femicide. *Forum Qual Soc Res.* (2016) 17:1–30. doi: 10.17169/fqs-17.1.2394
42. Chikwira R. *Survivors Narratives of Intimate Partner Violence in Cape Town, South Africa: A Life History Approach*. Doctoral Dissertation, University of Cape Town, Cape Town (2019).
43. Munn Z, Porritt K, Lockwood C, Aromataris E, Pearson A. Establishing confidence in the output of qualitative research synthesis: the ConQual approach. *BMC Med Res Methodol.* (2014) 14:1–7. doi: 10.1186/1471-2288-14-108
44. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* (2006) 3:77–101. doi: 10.1191/1478088706qp063oa
45. Chimah UC, Adogu POU, Ilika AL. Impact of intimate partner violence and coping strategies adopted among women in military and civilian communities of Abuja Nigeria. *Sch J App Med Sci.* (2015) 3:131–8. Available online at: https://www.researchgate.net/publication/280569783
46. Odero M, Hatcher AM, Bryant C, Onono M, Romito P, Bukusi EA, et al. Responses to and resources for intimate partner violence: qualitative findings from women, men, and service providers in rural Kenya. *J Interpers Violence.* (2014) 29:783–805. doi: 10.1177/0886260513505706
47. Itmi K, Dienye PO, Gbeneol PK. Intimate partner violence and associated coping strategies among women in a primary care clinic in Port Harcourt, Nigeria. *J Fam Med Prim Care*. (2014) 3:193. doi: 10.4103/2249-4863.141601
48. Muhammad-Farooq S, Saeed-Ali T, Parpio Y, Lalani N, Marjorie M. Why women suffer domestic violence in silence: Web-based responses to a blog. *Nurs Pract Today.* (2017) 4:203–11. Available online at: https://www.researchgate.net/publication/321711683
49. Copp JE, Giordano PC, Longmore MA, Manning WD. Stay-or-leave decision making in nonviolent and violent dating relationships. *Violence Vict.* (2015) 30:581–99. doi: 10.1891/0886-6708.VV-D-13-00176
50. Weingarten CA. *Intimate Partner Violence and Victim Blaming*. Doctoral Dissertation, DePaul University, Chicago, IL (2016).
51. Overstreet NM, Quinn DM. The intimate partner violence stigmatization model and barriers to help seeking. *Basic Appl Soc Psych.* (2013) 35:109–22. doi: 10.1080/01973533.2012.746599
52. Lokhmatkina NV, Agnew-Davies R, Costelloe C, Kuznetsova OY, Nikolskaya IM, Feder GS. Intimate partner violence and ways of coping with stress: cross-sectional survey of female patients in Russian general practice. *Fam Pract.* (2015) 32:141–6. doi: 10.1093/fampra/cmu086
53. St Vil NM, Sabri B, NwokoloV, Alexander KA, Campbell JC. A qualitative study of survival strategies used by low-income black women who experience intimate partner violence. *Soc Work.* (2017) 62:63–71. doi: 10.1093/sw/sww080
54. Pérez-Tarrés A, Cantera L, Pereira J. Gender-based violence, coping strategies and perceived social support. *Psicol conoc Soc.* (2017) 7:98–122. doi: 10.26864/v7n1.5
55. Sullivan TP, Schroeder JA, Dudley DN, Dixon JM. Do differing types of victimization and coping strategies influence the type of social reactions experienced by current victims of intimate partner violence? *Violence Against Women.* (2010) 16:638–57. doi: 10.1177/1077801210370027
56. Øverup CS, DiBello AM, Brunson JA, Acitelli LK, Neighbors C. Drowning the pain: Intimate partner violence and drinking to cope prospectively predict problem drinking. *Addict Behav.* (2015) 41:152–61. doi: 10.1016/j.addbeh.2014.10.006
57. Clark CJ, Ferguson G, Shrestha B, Shrestha PN, Oakes JM, Gupta J, et al. Social norms and women's risk of intimate partner violence in Nepal. *Soc Sci Med.* (2018) 202:162–9. doi: 10.1016/j.socscimed.2018.02.017
58. World Health Organization. *Understanding and Addressing Violence Against Women: Intimate Partner Violence.* (2012). Available online at: https://apps.who.int/iris/bitstream/handle/10665/77432/WHO_RHR_12.36_eng.pdf
59. Di Napoli I, Procentese F, Carnevale S, Esposito C, Arcidiacono C. Ending intimate partner violence (IPV) and locating men at stake: An ecological approach. *Int J Environ Res Public Health.* (2019) 16:1652. doi: 10.3390/ijerph16091652
60. Sprague C, Hatcher AM, Woollett N, Sommers T, Black V. 'They can't report abuse, they can't move out. They are at the mercy of these men': exploring connections between intimate partner violence, gender and HIV in South African clinical settings. *Cult Health Sex*. (2016). 18:567–81. doi: 10.1080/13691058.2015.1096420
61. Rasool S. Do we accept the unacceptable? The privatisation of women abuse by informal networks in South Africa. *AJGR.* (2012) 18:143–49. Available online at: https://www.researchgate.net/publication/282007785
62. van Niekerk TJ, Boonzaier FA. An intersectional analysis of responses to intimate partner violence in two marginalized south African communities. *IJCYF.* (2019) 10:26–48. doi: 10.18357/ijcyfs101201918805
63. Abramsky T, Musuya T, Namy S, Watts C, Michau L. Changing the norms that drive intimate partner violence: findings from a cluster randomised trial on what predisposes bystanders to take action in Kampala, Uganda. *BMJ Glob Health.* (2018) 3:e001109. doi: 10.1136/bmjgh-2018-001109
64. Meyer S. 'Acting in the children's best interest?': Examining victims' responses to intimate partner violence. *J Child Fam Stud.* (2011) 20:436–43. doi: 10.1007/s10826-010-9410-7
65. Stephens E, Melton HC.The impact of children on intimate partner abuse victims' service-seeking. *Women Crim Justice*. (2017) 27:191–203. doi: 10.1080/08974454.2016.1247773
66. Boshoff T. *Women's Reflections on Their Strategies Used to Protect Their Children in the Face of Domestic Violence*. Doctoral Dissertation, University of Pretoria, Pretoria (2018).
67. Gopal N, Nunlall R. Interrogating the resilience of women affected by violence. *Agenda.* (2017) 31:63–73. doi: 10.1080/10130950.2017.1379759
68. Resnick B. The relationship between resilience and motivation. In: *Resilience in Aging*. New York, NY: Springer. (2018). p. 221–44. Available at: https://link.springer.com/chapter/10.1007/978-3-030-04555-5_12

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

METHODS
published: 22 June 2021
doi: 10.3389/fpsyt.2021.614735

Validation of the Brazilian-Portuguese Version of the Clinician Administered Post Traumatic Stress Disorder Scale-5

Thauana Torres Oliveira-Watanabe[1,2†], Luis Francisco Ramos-Lima[3†], Cecilia Zylberstajn[1,2], Vinicius Calsavara[2], Bruno Messina Coimbra[1,2], Mariana Rangel Maciel[1,2], Lucia Helena Machado Freitas[3,4], Marcelo Feijo Mello[1,2] and Andrea Feijo Mello[1,2]*

[1] Post-Graduate Program in Medical Psychology and Psychiatry, Department of Psychiatry, Federal University of São Paulo, São Paulo, Brazil, [2] Program for Research and Care on Violence (PROVE) and Post Traumatic Stress Disorder, Federal University of São Paulo, São Paulo, Brazil, [3] Psychological Trauma Research and Treatment Program, Post Traumatic Stress Disorder, Clinical Hospital of Porto Alegre, Porto Alegre, Brazil, [4] Post-Graduate Program in Psychiatry and Behavioral Sciences, Federal University at Rio Grande Do Sul, Porto Alegre, Brazil

OPEN ACCESS

Edited by:
Haim Y. Knobler,
Hebrew University of Jerusalem, Israel

Reviewed by:
Leonardo Baldaçara,
Federal University of Tocantins, Brazil
Andres Ricardo Schneeberger,
Albert Einstein College of Medicine,
United States

***Correspondence:**
Thauana Torres Oliveira-Watanabe
thauanaepm77@hotmail.com

[†]These authors have contributed equally to this work and share first authorship

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: 07 October 2020
Accepted: 24 May 2021
Published: 22 June 2021

Citation:
Oliveira-Watanabe TT, Ramos-Lima LF, Zylberstajn C, Calsavara V, Coimbra BM, Maciel MR, Freitas LHM, Mello MF and Mello AF (2021) Validation of the Brazilian-Portuguese Version of the Clinician Administered Post Traumatic Stress Disorder Scale-5. Front. Psychiatry 12:614735. doi: 10.3389/fpsyt.2021.614735

Objectives: The aim of this study was to validate CAPS-5 for the Brazilian-Portuguese language on a sample of 128 individuals from two centers (from the cities of São Paulo and Porto Alegre) who have been recently exposed to a traumatic event.

Methods: We performed a reliability analysis between interviewers (with a subset of 32 individuals), an internal consistency analysis, and a confirmatory factorial analysis for the validation study.

Results: The inter-rater reliability of the total PTSD symptom severity score was high [intraclass correlation coefficient =0.994, 95% CI (0.987–0.997), $p < 0.001$]. Cohen's Kappa for individual items ranged between 0.759 and 1. Cronbach's alpha coefficients indicated high internal consistency for the CAPS-5 full scale ($\alpha = 0.826$) and an acceptable level of internal consistency for the four symptom clusters. The confirmatory factorial analysis for the 20-item original CAPS-5 did not fit the data well. A 15-item model with better results was then established by excluding the following CAPS-5 items: dissociative amnesia, recklessness, distorted cognitions, irritability, and hypervigilance.

Conclusion: Despite the limitation of the predominance of female victims, and the high number of sexually assaulted women in our sample, the model with only 15 items provided a good fit to the data with high internal consistency ($\alpha = 0.835$).

Keywords: post-traumatic stress disorder, assessment, instrument validation, clinician-administered PTSD scale, psychometric evaluation validity/reliability

INTRODUCTION

Post-traumatic stress disorder (PTSD) is a severe psychiatric condition developed after exposure to a traumatic event (1). Since 1980, when PTSD was first included in the third version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III), the definition has been changed and updated in the versions that followed (2). A traumatic event is required for

the diagnosis of PTSD, and this has been highlighted in DSM-5, as PTSD is no longer classified among Anxiety Disorders, but in a specific category of Trauma and Stressor-Related Disorders (3). Other changes to the classification of PTSD have restricted what qualifies as a traumatic event and have split the symptoms into four clusters: reexperience, avoidance, negative thoughts and cognitions, and hyperarousal.

Due to the burden of traumatic events, the World Health Survey Consortium conducted a study, which demonstrated that 70.4% of the respondents of all countries had experienced at least one traumatic event in their lifetime (4). In Brazil, this number is even higher: ∼80% of the Brazilian population has experienced a traumatic event, especially related to urban violence (5). This estimate raises great concern to the Brazilian public health system; an epidemiological study demonstrated that 10.2% of the trauma-exposed population in São Paulo and 8.7% in Rio de Janeiro develop PTSD (2). PTSD can cause a poorer quality of life, which consequently burdens health and social public services (3).

Due to the high prevalence of PTSD in Brazil, its proper assessment and diagnosis is crucial. Currently, the instrument recognized as the gold standard for evaluating PTSD is the clinician-administered PTSD scale (CAPS-5), a structured diagnostic interview to be applied by clinicians. In Brazil, although ICD-10 is the most used classification system regarding general medical diagnosis, concerning psychiatric diagnosis and research purposes DSM-5 is more used than ICD-10. The original scale (6), developed in English, has been last updated to match the DSM-5 PTSD diagnostic criteria (7). The scale has demonstrated high internal consistency, inter-rater reliability, and test-retest reliability. CAPS-5 also demonstrated good diagnostic correspondence with CAPS-IV (7) and has already been validated in other languages, such as Dutch and German (8, 9).

Adapting an instrument to a specific language has great significance, not only because of the language itself, but also because of the impact that differences in culture, beliefs, and behaviors have on understanding mental health (10). CAPS-5 was validated in the United States on predominantly male veterans (7), a very specific population that greatly differs from the PTSD population in the public health system of Brazil (11).

Brazilian epidemiological studies have revealed that women tend to be more often diagnosed with PTSD than men (12, 13). Ribeiro et al. (2) evaluated the conditional risk of developing PTSD following a traumatic event and found a three-fold increased risk of developing the disorder in females compared to that in males [15.9% in females (95% CI 14.2–17.6) vs. 5.1% in males (95% CI 4.0–6.2)]. These findings highlight the importance of adapting the original version of CAPS-5 to the Brazilian-Portuguese language and validating the instrument to better conduct research in Brazil.

The aim of this study was to validate CAPS-5 for the Brazilian-Portuguese language. Previously, our research team performed a cross-cultural adaptation process with a formal and structured methodology to ensure conceptual, semantic, and operational equivalence (14). In order to complete the validation process, we performed a reliability analysis between interviewers, evaluated internal consistency, and conducted a confirmatory factorial analysis (CFA). We hypothesized that the instrument would exhibit good inter-rater reliability and internal consistency, based on psychometric measurements obtained in previous studies performed in other countries (7–9).

METHODS

The CAPS-5 Instrument

The scale assesses the diagnostic criteria based on DSM-5 and the intensity of the PTSD symptoms; CAPS-5 is considered the gold standard in the diagnosis of PTSD. It has 30 questions, 20 of which correspond to each DSM-5 diagnostic criterion. The first question refers to the existence of a traumatic experience (Criteria A); the original scale recommends another instrument to evaluate the occurrence of traumatic events, usually the Life Events Checklist (LEC-5) (15). The LEC-5 is a self-report measure designed to recognize potentially traumatic events in a respondent's lifetime. We also used LEC-5 to evaluate Criteria A, adapted to Brazilian-Portuguese in a previous study (16).

The 20 symptom-related questions were divided into four groups: intrusion symptoms (five items, Criterion B), avoidance questions (two items, Criterion C), negative alterations in cognition and mood (seven items, Criterion D), and hyperarousal (six items, Criterion E). Concerning other DSM-5 criteria, one question refers to how long the identified traumatic event lasted (Criteria F) and three questions to the impact of the disturbance on functionality (Criteria G). Three final questions regarding the interviewer's impression on the patient are presented, along with two questions regarding the presence of dissociative symptoms.

To evaluate frequency and intensity, which is separately assessed, the scale rated intensity as *minimal*, *clearly present*, *pronounced*, and *extreme*, and frequency is recorded as reported by the respondent as the number of times the symptom is present. After that, severity can be rated: 0 = *absent*, 1 = *mild/subthreshold*, 2 = *moderate/threshold*, 3 = *severe/markedly elevated*, and 4 = *extreme/incapacitating*. The symptom is consider present if its severity rating is 2 or higher (7).

Cross-Cultural Adaptation

The cross-cultural adaptation process was performed within the Program for Research and Care on Violence and PTSD (PROVE) at the Department of Psychiatry of The Federal University of São Paulo (UNIFESP) according to the model proposed by Reichenheim and Moraes (10). This process included the following steps: translation from English to Portuguese, a back-translation to the original language, a revision by an expert team, a pilot study using the adapted version, and an equivalence evaluation with the original version. This adaptation was published previously (14).

Participants

This study was conducted in two centers: at UNIFESP and at the Clinical Hospital of Porto Alegre (HCPA), which belongs to the Federal University of Rio Grande do Sul (UFRGS). The participants spontaneously sought psychiatric assistance after experiencing a traumatic event and were enrolled from the screening process of both centers, except for sample 1 described

below, whose patients were addressed to UNIFESP after the first evaluation at a gynecological center, specialized to attend sexual abuse. In order to establish PTSD diagnosis, an experienced psychiatrist in attending PTSD patients performed a clinical evaluation in every patient during triage. All the participants who fulfilled the PTSD diagnostic criteria by DSM 5 after clinical assessment were invited to and agreed to participate in the study. Other inclusion criteria were to be able to understand the informed consent term (ICT), to be able to read and sign the ICT and being older than 18 years-old. Exclusion criteria were having other diagnosis besides PTSD (comorbid depression and anxiety were not excluded), and significant intellectual deficit.

The complete sample was composed of three groups of patients:

The first group (**Sample 1**) consisted of sexually assaulted women included in a randomized clinical trial, which is part of a thematic project sponsored by Fundação de Amparo a Pesquisa do Estado de São Paulo (FAPESP), conducted at PROVE-UNIFESP (17). The patients were enrolled between January 2016 and March 2019. The adapted CAPS-5 was applied during the screening process to select the participants for the study, together with other instruments concerning the thematic project. The scale was administrated by two trained professionals (one psychiatrist and one psychologist). All patients experienced the trauma up to 6 months before the assessment.

The second group (**Sample 2)** was enrolled from the screening process of PROVE outpatient's service. The participants spontaneously sought for psychiatric assistance after experiencing a traumatic event. The screening process was conducted by two professionals (one psychiatrist and one psychologist), who also applied the adapted version of CAPS-5. The patients were enrolled between March 2018 and February 2019.

The third group (**Sample 3)** was enrolled at the Psychological Trauma Research and Treatment Program (NET-Trauma) outpatient service from HCPA-UFRGS. The screening process was similar to the PROVE outpatient center; patients suffering different types of trauma agreed to participate in the study. They were assessed between August 2018 and February 2019. A summary of the three samples is presented in **Table 1**.

All the professionals who applied the instrument were trained for CAPS-5 use. In every case, the LEC-5 scale was applied to ensure that the DSM-5 Criteria A for PTSD was fulfilled. This study was conducted with approval from the Ethics Committees of both UNIFESP and HCPA-UFRGS. All participants signed the informed consent form.

Data Analysis

Reliability Between Interviewers

We compared the results of two independent interviewers (one psychiatrist and one psychologist), who had administered CAPS-5 to the same participants. All ratings were performed by the same two raters between different groups. For the reliability evaluation between interviewers, 32 participants were selected from Sample 1 ($n = 15$ participants) and 2 ($n = 17$ participants). We calculated the Cohen's kappa coefficient, considering a confidence interval of 95% and the 20 items of the scale as ordinal variables. The kappa coefficient varies between 1 and −1, which indicates complete agreement or complete disagreement, and a value of 0 indicates a random result (18). This coefficient was applied to all of the 20 items of the scale corresponding to DSM-5 symptoms. We also used the intraclass correlation coefficient to evaluate the total PTSD severity score (19).

Internal Consistency

We combined the three samples in order to obtain the minimal number of participants acceptable for a good psychometric analysis; the final sample comprised 128 participants. The Cronbach's alpha coefficient was used to determine internal consistency, which is considered good when the value is > 0.80 and most inter-item correlations are in the recommended range of moderate magnitude (0.15–0.50) (20).

CFA

We used the final sample (with 128 participants) to elucidate whether the CAPS-5 in the Brazilian context should have the same structure as the original CAPS-5, validated in the American context. The factor structure of the adapted CAPS-5 was examined using CFA. Items were treated as ordinal variables, and parameters were estimated using the maximum-likelihood estimator method, which provides good performance for small samples and a robust chi-square. The model fit was evaluated using chi-square under the degree of freedom ratio (X2/df): values < 3 are considered acceptable for the model; Goodness of Fit Index (GFI), Tucker-Lewis Index, Comparative Fit Index (CFI): values < 0.90 indicate a lack of fit, values between 0.90 and 0.95 indicate a reasonable fit, and values between 0.95 and 1.00 indicate a good fit; Root Mean Square Error of Approximation (RMSEA): values ≤ 0.06 indicate a close fit; and Standardized Root Mean Square Residual (SRMR): values < 0.08 indicate a well-fitting model (21, 22).

For comparative analysis, we performed the chi-square, One-Way ANOVA and Kruskal-Wallis for categorical and continuous variables. Demographic information was missing for up to six patients, depending on the variable, in Sample 2. Otherwise, no other missing data were detected. The significance level of the tests was fixed at 0.05. All statistical analysis were performed using SPSS version 21 (IBM Corporation, Armonk, NY, USA). The SPSS AMOS was used to perform CFA.

RESULTS

The sample included 128 patients: 97 patients from PROVE (Sample 1 and Sample 2) and 31 patients from HCPA-UFRGS (Sample 3). Most of the patients were female (93.8%), single (63.5%), employed (69.9%), and religious (66.9%). CAPS-5 total severity score and total amount of symptoms did not differ among samples (**Table 1**).

Inter-rater Reliability

To estimate the inter-rater reliability, we considered the 32 individuals from Samples 1 and 2 who had CAPS-5 performed by two interviewers. The inter-rater reliability of the total PTSD symptom severity score was high [intraclass correlation

TABLE 1 | Sociodemographic data from three samples ($n = 128$).

Variables	Sample 1 ($n = 80$)	Sample 2 ($n = 17$)	Sample 3 ($n = 31$)	All	*P*-value
Age (mean, sd)	25.5 (6.7)	37.8 (11.1)	35.9 (16.2)	29.7 (11.6)	<0.001[a]
Female gender	80 (100%)	14 (82.4%)	26 (83.9%)	120 (93.8%)	0.001[a]
Ethnicity					
Caucasian	32 (40.0%)	7 (43.8%)	19 (61.3%)	58 (45.7%)	<0.001[a]
African-American	46 (57.5%)	8 (50.0%)	5 (16.1%)	59 (46.5%)	
Asiatic-American	2 (2.5%)	1 (6.3%)	7 (22.6%)	10 (7.9%)	
Marital status					
Single	55 (68.8%)	9 (60.0%)	16 (51.6%)	80 (63.5%)	0.006[a]
Married/engaged	23 (28.7%)	4 (26.7%)	7 (22.6%)	34 (27.0%)	
Divorced/widower	2 (2.5%)	2 (13.3%)	8 (25.8%)	12 (9.5%)	
Educational level					
<4 years	0 (0%)	0 (0%)	2 (6.5%)	2 (1.6%)	0.001[a]
4–12 years	39 (48.8%)	2 (16.7%)	22 (71.0%)	63 (51.2%)	
>12 years	41 (51.2%)	10 (83.3%)	7 (22.6%)	58 (47.2%)	
Employment status					
Employed	63 (78.8%)	8 (66.7%)	15 (48.4%)	86 (69.9%)	0.011[a]
Unemployed/retired	13 (16.3%)	4 (33.3%)	10 (32.3%)	27 (22.0%)	
Health licensed	4 (5.0%)	0 (0%)	6 (19.4%)	10 (8.1%)	
Religious	55 (68.8%)	7 (53.8%)	21 (67.7%)	83 (66.9%)	0.567
Caps severity score (IQR)	41.5 (35.0–49.0)	40.0 (34.5–46.0)	42.0 (30.0–52.0)	41.5 (33.2–49.0)	0.955
# symptoms	15.0 (13.0–17.0)	15.0 (13.0–16.0)	15.0 (11.0–17.0)	15.0 (12.2–17.0)	0.529

[a] $p < 0.05$.
sd, standard deviation; IQR, Inter-quartile Range.

coefficient = 0.994, 95% CI (0.987–0.997), $p < 0.001$]. Cohen's kappa for each item was evaluated to determine if there was agreement between the two raters. Among the 20 items from the CAPS-5 scale, we found total agreement in four (B5/Physiological distress; C1/Memory avoidance; E1/Irritability; E2/Recklessness). We found Kappa between 0.759 and 0.8 in five items (D2/Distressing dreams, $k = 0.792$; C2/External avoidance, $k = 0.795$; D2/Negative beliefs, $k = 0.768$; D4/Negative states, $k = 0.759$; E5/Concentration problems, $k = 0.770$). The remaining 15 symptoms resulted in a kappa value > 0.8, indicating an "almost perfect" agreement between raters (**Table 2**).

Internal Consistency

Cronbach's alpha coefficients indicated high internal consistency for the CAPS-5 full scale ($\alpha = 0.826$) and an acceptable level of internal consistency (23) for the four symptom clusters: B/Intrusion ($\alpha = 0.631$), C/Avoidance ($\alpha = 0.404$), D/Negative cognitions ($\alpha = 0.701$), and E/Hyperarousal ($\alpha = 0.537$). Two symptoms, D1/Dissociative amnesia and E2/Recklessness, had low item-total correlations (0.025 and 0.095, respectively). The range of item-total correlations for the remaining 18 symptoms was 0.317–0.613, with a mean of 0.438. By excluding these two items, the Cronbach's alpha coefficient for the full scale increased to 0.842.

Most inter-item correlations were in the recommended range of 0.15–0.50 (20), with a mean of 0.193 across all 20 symptoms. The symptoms D1/Dissociative amnesia and E2/Recklessness exhibited low inter-item correlations, with values of 0.152 and 0.189, respectively. The mean inter-item correlation for the remaining 18 symptoms was 0.233.

CFA

CFA with the maximum-likelihood estimation method was conducted to determine whether the factor structure indicated by the original scale could be confirmed. We performed CFA for the 20-item original CAPS-5 scale and for the 18-item model with the exclusion of two items (D1 and E2), suggested by the internal consistency analysis. The fit indices for the 18-item model were X2/gl = 1.441, GFI = 0.861, CFI = 0.878, TFI = 0.855, RMSEA = 0.059, and SRMR = 0.076, supporting a reasonable fit to the data. We concluded that the 20-item and 18-item CAPS-5 models did not fit the data adequately well.

In order to improve the performance of the instrument, we analyzed all factor loads from each item from the 18-item model. We found three items with low factor loads: D3/Distorted cognitions (0.388), E1/Irritability (0.305), and E3/Hypervigilance (0.400). All other items had factor loads > 0.40. We then performed a third CFA of the 15 remaining items. The 15-item model exhibited a good fit to the data (X2/gl = 1.248, GFI = 0.910, CFI = 0.948, TFI = 0.951, RMSEA = 0.044, and SRMR = 0.063) (**Table 3**).

On observing the final 15-item model, all items were found to have significant loadings onto their respective latent constructs. The standardized regression weights (factor loadings) for all

items were >0.3, corresponding to good-magnitude loadings (21). The occurrence of factors with item reduction (two items in factor D/Negative cognitions and three items in factor E/Hyperarousal) may explain the relatively poor loadings. The item D5/Diminished interest exhibited a high factor load: 81% of the factor variance was accounted by this item, suggesting that D5/Diminished interest is a strong indicator of negative cognition. All other factor loadings ranged between 0.40 and 0.65 (**Table 4**).

We calculated the new Cronbach's alpha coefficients for the 15-item model and found improvement compared with the full scale. The 15-item model exhibited high internal consistency ($\alpha = 0.835$), and the two factors with item reduction maintained acceptable levels of internal consistency: D/Negative cognitions ($\alpha = 0.747$) and E/Hyperarousal ($\alpha = 0.403$).

TABLE 2 | Inter-raterreliability coefficients of CAPS-5 ($n = 36$).

Factor	Item	Kappa
B Intrusion	B1 Recurrent memories	0.880*
	B2 Distressing dreams	0.792*
	B3 Dissociative reactions	0.953*
	B4 Psychological distress	0.897*
	B5 Physiological reactions	1*
C Avoidance	C1 Memory avoidance	1*
	C2 External avoidance	0.795*
D Negative cognitions	D1 Dissociative amnesia	0.842*
	D2 Negative beliefs	0.768*
	D3 Distorted cognitions	0.960*
	D4 Negative states	0.759*
	D5 Diminished interest	0.813*
	D6 Feelings of detachment	0.952*
	D7 Reduction of positive emotions	0.956*
E Hyperarousal	E1 Irritability	1*
	E2 Recklessness	1*
	E3 Hypervigilance	0.857*
	E4 Startle response	0.871*
	E5 Concentration problems	0.770*
	E6 Sleep disturbance	0.823*

*$p < 0.001$.

DISCUSSION

The present study describes the development of the Brazilian-Portuguese version of the CAPS-5 scale, a unique instrument for clinicians to evaluate PTSD in a structured manner in Brazil. Our research team has already translated the original English scale using a structured method published elsewhere (14). The present study now demonstrates a high inter-rater reliability for all 20 items and the total severity score. It is important to emphasize that the raters were experienced professionals in attending PTSD patients. Further studies with less experienced health-care professionals are necessary to determine the consistency of our results.

The present study has demonstrated an adequate internal consistency for the four clusters of symptoms and high internal consistency for the full scale. These findings are in line with previous scale validations for other languages (8, 9) as well as the validation of the original CAPS-5 version (7). Lower Cronbach's alpha coefficients for the cluster C/Avoidance have been reported

TABLE 4 | Parameter estimates for the 15-item CAPS-5 model.

Factor	Item	Estimate	SE	FL
B Intrusion	B1	1.00		0.45
	B2	1.88	0.47*	0.52
	B3	1.99	0.51*	0.50
	B4	1.04	0.26*	0.42
	B5	2.13	0.49*	0.62
C Avoidance	C1	1.00		0.48
	C2	1.41	0.36*	0.54
D Negative cognitions	D2	1.00		0.65
	D4	.52	0.12*	0.45
	D5	1.26	0.18*	0.81
	D6	.94	0.16*	0.60
	D7	1.03	0.19*	0.58
E Hyperarousal	E4	1.00		0.40
	E5	1.01	0.25*	0.41
	E6	1.12	0.26*	0.47

*$p < 0.001$.
Estimate, unstandardized regression weights; SE, standard error of the unstandardized regression weights; FL, factor loadings (standardized regression weights).

TABLE 3 | CFA fit statiscs for 20-item, 18-item, and 15-item CAPS-5 models.

Fit index	Level of good fit[a]	20-item	18-item	15-item
X2/df	<3	1.350	1.441	1.248
GFI	>0.9	0.854	0.861	0.910
CFI	>0.9	0.878	0.878	0.948
TFI	>0.9	0.858	0.855	0.951
RMSEA (90% CI)	<0.06	0.052 (0.033–0.069)	0.059 (0.039–0.077)	0.044 (0.000–0.069)
SRMR	<0.08	0.076	0.076	0.063

[a]*Brown (21) and Hu and Bentler (22).*

before and can be explained by the existence of only two items in this cluster; similar results were found in the original English version and in the Dutch translated version (7, 9). On observing the items separately, we found that two items had a low item-total correlation (D1/Dissociative amnesia and E2/Recklessness), consistent with the findings of the original English version. According to the original CAPS-5 validation process (7), these findings may be attributable to a very infrequent endorsement of these two symptoms, corroborating the hypothesis that these items may be important but relatively rare symptoms of PTSD, or it may be that they are simply not representative of the PTSD construct.

A CFA was conducted to verify adequate fit to the data. Due to the similar validation process of CAPS-5 in previous studies and the existence of consolidated constructs (clusters) that explain PTSD, we decided to perform only a CFA instead of evaluating constructs from the entire scale (with exploratory factor analysis). Previous results from internal consistency analysis were used to suggest items for exclusion; the 15-item model provided the best fit to the data, compared to the full scale and 18-item model. We postulated that a 15-item model for CAPS-5 could maintain adequate results without compromising diagnostic capacity.

The use of heterogeneous data from different sources is a strength of the present study and is in contrast to the validation of the original scale, which was based on symptoms observed in only war veterans. It would be of interest for future studies to perform a more complete evaluation of the scale construct. A challenge observed in this study was the maintenance of the original structure and constructs/factors in the CFA: the occurrence of factors composed of few items can explain the relatively low factor loads. Other strong points are the well-trained professionals that were able to diagnose PTSD properly, only one research team undertaking the entire adaptation process of the scale, and strong inclusion criteria for the participants.

This study presents a limitation regarding the validation process. The main objective of this study was to adapt the scale for the Portuguese language and test its reliability and consistent validity. During the validation process, this study considered maintaining the original scale and its content validity; we did not intend to construct a different scale structure for the Brazilian context with the present results and to perform a complete validation study.

Another important limitation must be considered: although we were able to evaluate individuals from different institutions and sources, a significant number of participants were women who experienced a traumatic event related to sexual violence. To minimize the impact of using a convenience sample, we included participants from two different trauma centers and also 3 different samples, two of them with spontaneous demand, but it was observed that even in centers that receive all types of trauma in a naturalistic setting, a large number of patients are female who seek treatment for sexual assault. This is very common in a low- to middle-income country such as Brazil, where this type of trauma has a high prevalence due to the social context (24). However, this limitation compromises the generalization capacity of the study results. It is also important to mention that the original validation study for the English version had presented the same limitation, using a convenience sample composed only by war veterans, majoritarian male participants. Therefore, future studies should assess the consistency of results by comparing the 15-item scale with the 20-item scale for different types of traumatic events.

CONCLUSION

In developing countries, PTSD is mostly related to urban violence that has a high frequency of traumatic events, such as robbery, kidnapping, sexual assault, rape, witnessing shootings, and other life-threatening situations. This is frequently related to complex PTSD diagnoses; thus, we must ensure that the CAPS-5 is an efficient instrument to detect this reality. Establishing a validated version of a Brazilian-Portuguese diagnostic instrument to evaluate PTSD symptomatology is extremely important for researchers to better understand these issues in this socio-cultural context.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethical Committee of UNIFESP and UFRGS. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

CZ and BC were involved with the data collection. VC had data analyzed. MMa reviewed the article and helped with the discussion and the data collection. LF, MMe, and AM guided all the research process and reviewed the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

This work was supported by Fundação de Apoio à Pesquisa do Estado de São Paulo (FAPESP) Thematic Project number 2014/12559-5. Additional grant support came from CNPq 303389/2016-8. This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001.

ACKNOWLEDGMENTS

The authors wish to thank all the researchers involved in the Thematic Project that participated in data collection (Cecilia R. Proença, Bruna S. Nicoletta; Fernando R. Grecco; Ana Teresa D. D'Elia, Mary S. L. Yeh; Flavia F. Strumpf; Nina L. M. Valente) and the patients that contributed for increasing our knowledge on how to deal with sexual violence consequences on mental health.

REFERENCES

1. American Psychiatric Association. *DSM-5 Task Force. Diagnostic and Statistical Manual of Mental Disorders : DSM-5*. Washington, DC: American Psychiatric Pub (2013).
2. Ribeiro WS, de Mari JJ, Quintana MI, Dewey ME, Evans-Lacko S, Vilete LMP, et al. The impact of epidemic violence on the prevalence of psychiatric disorders in Sáo Paulo and Rio de Janeiro, Brazil. *PLoS ONE*. (2013) 8:e63545. doi: 10.1371/journal.pone.0063545
3. Atwoli L, Stein DJ, Koenen KC, McLaughlin KA. Epidemiology of posttraumatic stress disorder: prevalence, correlates and consequences. *Curr Opin Psychiatry*. (2015) 28:307–11. doi: 10.1097/YCO.0000000000000167
4. Benjet C, Bromet E, Karam EG, Kessler RC, McLaughlin KA, Ruscio AM, et al. The epidemiology of traumatic event exposure worldwide: results from the World Mental Health Survey Consortium. *Psychol Med*. (2016) 46:327–43. doi: 10.1017/S0033291715001981
5. Teche SP, Barros AJS, Rosa RG, Guimarães LP, Cordini KL, Goi JD, et al. Association between resilience and posttraumatic stress disorder among Brazilian victims of urban violence: a cross-sectional case-control study. *Trends Psychiatry Psychother*. (2017) 39:116–23. doi: 10.1590/2237-6089-2016-0070
6. Blake DD, Weathers FW, Nagy LM, Kaloupek DG, Gusman FD, Charney DS, et al. The development of a clinician-administered PTSD scale. *J Traum Stress*. (1995) 8:75–90. doi: 10.1002/jts.2490080106
7. Weathers FW, Bovin MJ, Lee DJ, Sloan DM, Schnurr PP, Kaloupek DG, et al. The clinician-administered PTSD scale for DSM−5 (CAPS-5): development and initial psychometric evaluation in military veterans. *Psychol Assess*. (2018) 30:383–95. doi: 10.1037/pas0000486
8. Boeschoten MA, Van der Aa N, Bakker A, Ter Heide FJJ, Hoofwijk MC, Jongedijk RA, et al. Development and evaluation of the Dutch clinician-administered PTSD scale for DSM-5 (CAPS-5). *Eur J Psychotraumatol*. (2018) 9:1546085. doi: 10.1080/20008198.2018.1546085
9. Müller-Engelmann M, Schnyder U, Dittmann C, Priebe K, Bohus M, Thome J, et al. Psychometric properties and factor structure of the German version of the clinician-administered PTSD scale for DSM-5. *Assessment*. (2018) 27. doi: 10.1177/1073191118774840
10. Reichenheim ME, Moraes CL. Operacionalização de adaptação transcultural de instrumentos de aferição usados em epidemiologia. *Revista de Saude Publica*. (2007) 41. doi: 10.1590/S0034-89102006005000035
11. Ramos-Lima LF, de Souza PRA, Teche SP, Freitas LHM. Trauma-related disorders in a low- to middle-income country: a four-year follow-up of outpatient trauma in Brazil. *Psychiatry Res*. (2019) 280:112525. doi: 10.1016/j.psychres.2019.112525
12. Andrade LH, Wang YP, Andreoni S, Silveira CM, Alexandrino-Silva C, Siu ER, et al. Mental disorders in megacities: findings from the São Paulo megacity mental health survey, Brazil. *PLoS ONE*. (2012) 7:e31879. doi: 10.1371/journal.pone.0031879
13. Seedat S, Scott KM, Angermeyer MC, Berglund P, Bromet EJ, Brugha TS, et al. Cross-national associations between gender and mental disorders in the World Health Organization world mental health surveys. *Arch Gen Psychiatry*. (2009) 66:785–95. doi: 10.1001/archgenpsychiatry.2009.36
14. Oliveira-Watanabe TT, Ramos-Lima LF, Santos RC, Mello MF, Mello AF. The clinician-administered PTSD scale (CAPS-5): adaptation to Brazilian Portuguese. *Revista Brasileira de Psiquiatria*. (2019) 41:92–3. doi: 10.1590/1516-4446-2018-0136
15. Gray MJ, Litz BT, Hsu JL, Lombardo TW. Psychometric properties of the life events checklist. *Assessment*. (2004) 11:330–41. doi: 10.1177/1073191104269954
16. de Lima EP, Vasconcelos AG, Berger W, Kristensen CH, do Nascimento E, Figueira I, et al. Cross-cultural adaptation of the posttraumatic stress disorder checklist 5 (PCL-5) and life events checklist 5 (LEC-5) for the Brazilian context. *Trends Psychiatry Psychother*. (2016) 38:207–15. doi: 10.1590/2237-6089-2015-0074
17. Coimbra BM, Yeh M, D'Elia AT, Maciel MR., Carvalho CM, Milani AC, et al. Posttraumatic stress disorder and neuroprogression in women following sexual assault: protocol for a randomized clinical trial evaluating allostatic load and aging process acceleration. *JMIR Res Protoc*. (2020) 9:e19162. doi: 10.2196/19162
18. Andreoli S, Blay SL, de Almeida Filho N, de Jesus Mari J, Torres de Miranda CT, da Silva Freire Coutinho E, et al. Reliability of diagnostic instruments: investigating the psychiatric DSM-III checklist applied to community samples. *Cadernos de Saúde Pública*. (2001) 17:1393–402. doi: 10.1590/S0102-311X2001000600010
19. Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. *Psychol Bull*. (1979) 86:420–8. doi: 10.1037/0033-2909.86.2.420
20. Clark LA, Watson D. Constructing validity: basic issues in objective scale development. *Psychol Assess*. (1995) 7:309–19. doi: 10.1037/1040-3590.7.3.309
21. Brown T. Confirmatory factor analysis for applied research. New York, NY: Guilford Publications (2015).
22. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equation Model*. (1999) 6:1–55. doi: 10.1080/10705519909540118
23. Gorenstein C, Wang YP, Hungerbühler I. *Fundamentos de mensuração em saúde mental; Instrumentos de avaliação em saúde mental*. Artmed Ed. Porto Alegre (2016).
24. Both LM, Favaretto TC, Freitas LHM, da Cruz Benetti SP, Crempien C. Intimate partner violence against women: Operationalized Psychodynamic Diagnosis (OPD-2). *PLoS One*. (2020) 15:e0239708. doi: 10.1371/journal.pone.0239708

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

OPINION
published: 25 June 2021
doi: 10.3389/fpsyt.2021.650671

A Possible Next Covid-19 Pandemic: The Violence Against Women and Its Psychiatric Consequences

Domenico De Berardis[1,2]*, *Giulia Gianfelice*[1], *Michele Fornaro*[2], *Federica Vellante*[3], *Antonio Ventriglio*[4], *Gabriella Marini*[5], *Mauro Pettorruso*[2], *Giovanni Martinotti*[2], *Silvia Fraticelli*[2] *and Massimo Di Giannantonio*[2]

[1] National Health Service, Department of Mental Health, Psychiatric Service for Diagnosis and Treatment, Hospital "G. Mazzini," Azienda Sanitaria Locale 4, Teramo, Italy, [2] Department of Neurosciences and Imaging, Chair of Psychiatry, University "G. D'Annunzio" Chieti, Chieti, Italy, [3] Department of Psychiatry, Federico II University, Naples, Italy, [4] Department of Psychiatry, University of Foggia, Foggia, Italy, [5] ANAAO Assomed Syndicate, Women Section, Hospice and Palliative Therapy Unit, ASL Teramo, Teramo, Italy

OPEN ACCESS

Edited by:
Mauro Giovanni Carta,
Università di Cagliari, Italy

Reviewed by:
Vera Mateus,
Mackenzie Presbyterian University, Brazil
Eleni Vousoura,
American College of Greece, Greece
Federica Sancassiani,
University of Cagliari, Italy

***Correspondence:**
Domenico De Berardis
domenico.deberardis@aslteramo.it

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: 07 January 2021
Accepted: 28 May 2021
Published: 25 June 2021

Citation:
De Berardis D, Gianfelice G, Fornaro M, Vellante F, Ventriglio A, Marini G, Pettorruso M, Martinotti G, Fraticelli S and Di Giannantonio M (2021) A Possible Next Covid-19 Pandemic: The Violence Against Women and Its Psychiatric Consequences. Front. Psychiatry 12:650671. doi: 10.3389/fpsyt.2021.650671

Keywords: COVID-19, violence, women, maltreatment, psychiatric disorders

INTRODUCTION

Covid-19 has left the aftermath characterized by an increase of psychological distress due to several causes, such as social distancing, fear of contagion, less utilization of healthcare resources, and last but not least, the lockdown in several countries. The lockdown has negatively affected the psychological well-being and has favored the emergence or re-exacerbation of psychiatric disorders (1).

The "forced" lockdown has obliged families to live together under the same home and, often, in a restricted objective and personal spaces. The problem now is that, due to the lockdown measures, families are forced to live together 24/7 compared to the time they would spend all together before the pandemic. This has increased the possibility of conflicts, quarrels, and episodes of interpersonal violence. Moreover, one of the most critical issues of the lockdown has involved the cohabitation of families that were problematic and, particularly, couples with marriage problems and were also approaching a divorce or a separation before COVID-19 (2). Sadly, many females may have paid the higher price of this forced cohabitation in a global context that was, even before, highly alarming regarding the violence against women (VAW) and girls.

Moreover, the VAW was still a worldwide and community health problem even before the COVID-19 pandemic, but it was often neglected in this particular period (as it happened for mental health as well), and therefore our opinion paper aims to draw attention to it.

THE VIOLENCE AGAINST THE WOMEN AS A WORLDWIDE PROBLEM DURING COVID-19 PANDEMIC

The Declaration on the Elimination of Violence Against Women, adopted by the United Nations General Assembly in 1993, defined VAW as "any act of gender-based violence that results in, or is likely to result in, physical, sexual, or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life." (3) Hence, VAW is expressed through physical, sexual, emotional, and economic methods. The universal categories of VAW are domestic and sexual violence, sexual harassment, and psychological forms of abuse (4).

Available shreds of evidence showed that almost one in three women has suffered physical and/or sexual violence from a close partner in her life (5). In 2018, the WHO conducted an analysis of prevalence analyzing data from 2000 to 2018 in 161 countries and found that worldwide, nearly 1 in 3, or 30%, of women have been subjected to physical and/or sexual violence by an intimate partner or non-partner. In addition, women may face greater vulnerability to multiple forms of discrimination (older women, those living with disabilities, LGBTQI and trans women, migrants, displaced and refugee women, victims of armed conflict, indigenous women, etc.) (6). Finally, there is evidence that the violence against women might increase after natural disasters (7). For example, an increase in psychological violence and sexual harassment against women was reported within the communities of several Iranian regions struck by earthquakes and floods between 2012 and 2013 (8). As well, another study conducted in Japan has yielded similar results (9).

However, this phenomenon has become a cause of concern during and after the COVID-19 lockdown in many countries worldwide (10).

Aguero (11) reported an increase in calls to the helpline for violence against women in Peru after stay-at-home policies in mid-March, with a 48 percent rise since the pandemic and still increasing over time. In the Hubei province of China, the police reports have pointed out the triplicating of domestic violence events against women in February 2020 than February 2019, guessing that 90% were related to the Covid-19 and lockdown (12). In the United Kingdom, a pioneering project against women violence reported 16 deaths between March 23 and April 12, 2020, which was almost doubled compared with the mean rate in the preceding 10 years (12). Finally, Jetelina et al. (13) conducted a cross-sectional study to evaluate intimate partner violence (IPV) severity and the categories of victimization during the initial stages of the COVID-19 pandemic in the USA. They found that sexual and physical violence increased during the initial stages of the pandemic, but sexual violence considerably worsened among victims as a potential effect of spending more hours of the day at home.

Speaking at a press briefing on May 7, 2020, Hans Kluge, regional director of WHO Europe, reported that "WHO is deeply troubled by the reports from many countries, including Belgium, Bulgaria, France, Ireland, Russian Federation, Spain, UK, and others of increases in interpersonal violence, including violence against women and men, by an intimate partner and against children—because of the COVID-19 response" (14).

In Italy, it has been reported by the Italian network of shelters for women subjected to gender-based violence (Donne in rete contro la violenza, D.i.Re) that 2,956 women asked for help from anti-violence centers, with 979 (33.1%) asking help for the first time, between April 6 and May 3, 2020 (15). However, before these dates, the number was lower, and a possible explanation may be that the abused women were under the control of the perpetrators, unable to ask for help and that several anti-violence centers were closed due to the pandemic.

Moreover, it is worthy to note that, during the lockdown, has been reported increased use of alcohol and other substances, leading, in some cases, to Alcohol or Substance Use Disorders, even in subjects without these problems before lockdown (16). This increase in alcohol and substance use or abuse may have triggered the violence in perpetrators or exacerbated previous marriage problems. Moreover, job loss, monetary problems, foodstuff uncertainty, and privation of social support may have contributed to increased violence odds by men against women (17). Moreover, a recent study pointed out that the lockdown due to the COVID-19 spread could foster a dysregulation of biological and social rhythms and, consequently, the occurrence of Bipolar Disorders, and this might be a cause of increased alcohol and other substances use and abuse (18).

What can we expect during Phases Two (i.e., the loosening of lockdown measures)? First, there are some observations that a constant increase in violence reporting against the women happened during the lockdown (19). This may overwhelm the anti-violence center leading to potential difficulty addressing this phenomenon and supporting the victims. Thus, many women may not receive help and be left to cope with these terrible situations independently.

PSYCHIATRIC CONSEQUENCES OF VIOLENCE AGAINST WOMEN DURING COVID-19 PANDEMIC

It has been demonstrated that the psychiatric consequences of violence against the women (when the victim survives, as femicide is frequent) are the development of Adjustment Disorders, Acute Stress Disorder, and Post-Traumatic Stress Disorder that may also complicate with other several conditions as Major Depression, substance abuse and suicidal behaviors (20), even in women without a prior history of psychiatric disorders.

Besides, VAW and IPV might increase in pregnancy/postpartum or has deleterious effects on mother-infant bonding and child outcomes (21). In a recent systematic review, Pastor-Moreno et al. (22) showed a relation between psychological IPV and adverse outcomes, including premature rupture of membranes, preterm birth, urinary tract infections, and late entry into prenatal care. In addition, sexual IPV was associated with late entry into prenatal care, urinary tract infections, and low birth weight. Moreover, IPV during pregnancy/postpartum might increase the risk of developing severe mental illnesses in both victims and sons (23).

Moreover, several women victims of violence may experience a re-exacerbation of pre-existent psychiatric disorders, with a considerable risk of disorder' chronicity and increased severity (20). It has been demonstrated that women with severe psychiatric disorders are at increased risk of becoming domestic violence victims: this may be particularly true during the pandemic (24). A large Swedish registry study found that, compared to general population controls, all psychiatric diagnoses studied (except autism) were associated with an increased risk of domestic violence against women in men (25). Therefore, particular attention should be given by psychiatrists to such persons during the pandemic.

Moreover, a woman who is a victim of violence may quickly develop suicidal ideation that may elicit suicidal behaviors,

especially when the violence is frequent and she has no way to escape or get help and support (26). Therefore, the existence of clinically manifest suicide ideation, independent of current psychopathology, must always be actively evaluated and adequately addressed (27).

All these issues may also take into account the psychological distress generated by the COVID-19 (i.e., fear of contagion and death, worrying about close relatives, sleep disturbances, forced inactivity, binge eating, etc.), triggering a vicious circle wherein violence' consequences overlap on COVID-19 psychological anguish, thus potentially enhancing each other. Moreover, the children of maltreated women may be at risk of developing psychiatric consequences that may impact their lives and their future, as they may also be victims of violence by the same perpetrator or even witness acts of violence on beloved ones (28).

It is worthy of note that, in some countries, the social and economic disparities might further impact women, thus increasing the possibility of being a victim of violence in such less disadvantaged contexts (29).

VIOLENCE AGAINST THE WOMEN DURING COVID-19 PANDEMIC: A CALL OF ACTION

To date, psychiatrists and mental health workers should be organized and prepared to evaluate this new potential gender-based "psychiatric" pandemic. Health and mental health facilities should systematically search for potential warning signs of VAW, improving recognition, management, and referral pathways for sufferers. Such signs might include partner bullies, threatens, controls, partner' cutting off women from family and friends, strict control on women's money and financial incomes, objective signs of physical abuse and beating, etc. In addition, we believe that all health workers need to be appropriately trained in diagnosing trauma-related conditions and conducting a dialogue with the victim to detect them (13).

The psychiatric services must work together with the anti-violence centers, which should be rapidly empowered with trained personnel and financial support. Moreover, telehealth should be implemented (30) as it is a suitable instrument to give easy-to-use and affordable support through several web platforms that have demonstrated usefulness during the lockdown (31). Several studies have demonstrated that telehealth interventions might help detect women's health concerns, including violence and IPV (32–34). Psychological approaches to depressive and post-traumatic symptoms through supportive psychotherapy, cognitive behavior therapy, and interpersonal therapy are particularly significant and should be provided to all victims.

Moreover, substance use disorders, as primary or comorbid diagnoses, are associated with the highest absolute and relative risks of domestic violence perpetrated by men (35), so treatment for these, together with any comorbid psychiatric disorder, should be prioritized working together with the centers for the Addictions (36).

However, we firmly believe that cultural change and prevention campaigns are urgently needed. Bellizzi et al. (9) stated there is a need for several countries to guarantee that policies and measures equally address prevention, protection, investigation, and punishment that require coordination between national, regional, and local authorities. The "RESPECT women" document of WHO seems a useful model on which to build effective strategies (R–elationship skills strengthened; E–mpowerment of women; S–ervices ensured; P–overty reduced; E–nvironments made safe; C–hild and adolescent abuse prevented; T–ransformed attitudes, beliefs, and norms) (37). However, in some cases, specific barriers for women to access services and for health care utilization exist, including minimization of forms of abuse, perceptions of abuse and violence as normal, lack of awareness of services, the fear for the lack of confidentiality and stigma and the poor social and community support (38) and these should be overcome with specific campaigns and targeted interventions.

Finally, worldwide communities must be aware and conscious of this phenomenon, improving knowledge and advocacy through such national campaigns and projects, as often neighbors and friends may be the first line of communication for sufferers during lockdown or restrictions. These preventive strategies to contrast the violence against women help give details on help requests and management pathways.

Moreover, greater attention should be given to contexts in which this phenomenon is widespread, even not adequately studied, as among female migrant populations (39). In such populations, due to the multitude of risk factors that women living in these contexts already face up to, COVID-19 negative impact and consequences on their mental health, including violence against them, could be even worse, and every effort should be made to prevent it.

AUTHOR CONTRIBUTIONS

All authors have contributed to this paper with equal efforts.

REFERENCES

1. De Berardis D, Fornaro M, Vellante F, Orsolini L, Tomasetti C, Ventriglio A, et al. Earthquakes, economic crisis and, now, COVID-19: the cry of yell of central Italy. *Psychiatry Res.* (2020) 291:113181. doi: 10.1016/j.psychres.2020.113181
2. Vora M, Malathesh BC, Das S, Chatterjee SS. COVID-19 and domestic violence against women. *Asian J Psychiatr.* (2020) 53:102227. doi: 10.1016/j.ajp.2020.102227
3. World Health Organization. *Responding to Intimate Partner Violence and Sexual Violence Against Women: WHO Clinical and Policy Guidelines*. Geneva: World Health Organization (2013).
4. Krahe B. Violence against women. *Curr Opin Psychol.* (2018) 19:6–10. doi: 10.1016/j.copsyc.2017.03.017
5. Oram S, Khalifeh H, Howard LM. Violence against women and mental health. *Lancet Psychiatry.* (2017) 4:159–70. doi: 10.1016/S2215-0366(16)30261-9
6. Casey EA, Carlson J, Fraguela-Rios C, Kimball E, Neugut TB, Tolman RM, et al. Edleson: context, challenges, and tensions in global efforts to engage men

in the prevention of violence against women: an ecological analysis. *Men Masc.* (2013) 16:228–51. doi: 10.1177/1097184X12472336
7. Fisher S. Violence against women and natural disasters: findings from post-tsunami Sri Lanka. *Viol Against Women.* (2010) 16:902–18. doi: 10.1177/1077801210377649
8. Sohrabizadeh S. A qualitative study of violence against women after the recent disasters of Iran. *Prehosp Disaster Med.* (2016) 31:407–12. doi: 10.1017/S1049023X16000431
9. Yoshihama M, Yunomae T, Tsuge A, Ikeda K, Masai R. Violence against women and children following the 2011 great east japan disaster: making the invisible visible through research. *Viol Against Women.* (2019) 25:862–81. doi: 10.1177/1077801218802642
10. Evans ML, Lindauer M, Farrell ME. A pandemic within a pandemic - intimate partner violence during Covid-19. *N Engl J Med.* (2020) 383:2302–4. doi: 10.1056/NEJMp2024046
11. Aguero JM. COVID-19 and the rise of intimate partner violence. *World Dev.* (2020) 137:105217. doi: 10.1016/j.worlddev.2020.105217
12. Roesch E, Amin A, Gupta J, Garcia-Moreno C. Violence against women during covid-19 pandemic restrictions. *BMJ.* (2020) 369:m1712. doi: 10.1136/bmj.m1712
13. Jetelina KK, Knell G, Molsberry RJ. Changes in intimate partner violence during the early stages of the COVID-19 pandemic in the USA. *Inj Prev.* (2020) 27:93–7. doi: 10.1136/injuryprev-2020-043831
14. Mahase E. Covid-19: EU states report 60% rise in emergency calls about domestic violence. *BMJ.* (2020) 369:m1872. doi: 10.1136/bmj.m1872
15. Bellizzi S, Nivoli A, Lorettu L, Farina G, Ramses M, Ronzoni AR. Violence against women in Italy during the COVID-19 pandemic. *Int J Gynaecol Obstet.* (2020) 150:258–9. doi: 10.1002/ijgo.13270
16. Spagnolo PA, Montemitro C, Leggio L. New challenges in addiction medicine: COVID-19 infection in patients with alcohol and substance use disorders-the perfect storm. *Am J Psychiatry.* (2020) 177:805–7. doi: 10.1176/appi.ajp.2020.20040417
17. Chandan JS, Taylor J, Bradbury-Jones C, Nirantharakumar K, Kane E, Bandyopadhyay S. COVID-19: a public health approach to manage domestic violence is needed. *Lancet Public Health.* (2020) 5:e309. doi: 10.1016/S2468-2667(20)30112-2
18. Carta MG, Ouali U, Perra A, Ben Cheikh Ahmed A, Boe L, Aissa A, et al. Living with bipolar disorder in the time of Covid-19: biorhythms during the severe lockdown in Cagliari, Italy, and the moderate lockdown in Tunis, Tunisia. *Front Psychiatry.* (2021) 12:634765. doi: 10.3389/fpsyt.2021.634765
19. Sacco MA, Caputo F, Ricci P, Sicilia F, De Aloe L, Bonetta CF, et al. The impact of the Covid-19 pandemic on domestic violence: the dark side of home isolation during quarantine. *Med Leg J.* (2020) 88:71–3. doi: 10.1177/0025817220930553
20. Santos AGD, Monteiro CFS, Feitosa CDA, Veloso C, Nogueira LT, Andrade E. Types of non-psychotic mental disorders in adult women who suffered intimate partner violence: an integrative review. *Rev Esc Enferm USP.* (2018) 52:e03328. doi: 10.1590/s1980-220x2017030203328
21. Hou F, Zhang X, Cerulli C, He W, Mo Y, Gong W. The impact of intimate partner violence on the trajectory of perinatal depression: a cohort study in a Chinese sample. *Epidemiol Psychiatr Sci.* (2020) 29:e133. doi: 10.1017/S2045796020000463
22. Pastor-Moreno G, Ruiz-Perez I, Henares-Montiel J, Escriba-Aguir V, Higueras-Callejon C, Ricci-Cabello I. Intimate partner violence and perinatal health: a systematic review. *BJOG.* (2020) 127:537–47. doi: 10.1111/1471-0528.16084
23. Hahn CK, Gilmore AK, Aguayo RO, Rheingold AA. Perinatal intimate partner violence. *Obstet Gynecol Clin North Am.* (2018) 45:535–47. doi: 10.1016/j.ogc.2018.04.008
24. Gulati G, Kelly BD. Domestic violence against women and the COVID-19 pandemic: What is the role of psychiatry? *Int J Law Psychiatry.* (2020) 71:101594. doi: 10.1016/j.ijlp.2020.101594
25. Yu R, Nevado-Holgado AJ, Molero Y, D'Onofrio BM, Larsson H, Howard LM, et al. Mental disorders and intimate partner violence perpetrated by men towards women: a Swedish population-based longitudinal study. *PLoS Med.* (2019) 16:e1002995. doi: 10.1371/journal.pmed.1002995
26. Indu PV, Remadevi S, Vidhukumar K, Shah Navas PM, Anilkumar TV, Subha TV. Domestic violence as a risk factor for attempted suicide in married women. *J Int Viol.* (2020) 35:5753–71. doi: 10.1177/0886260517721896
27. Kavak F, Akturk U, Ozdemir A, Gultekin A. The relationship between domestic violence against women and suicide risk. *Arch Psychiatr Nurs.* (2018) 32:574–9. doi: 10.1016/j.apnu.2018.03.016
28. Marques ES, Moraes CL, Hasselmann MH, Deslandes SF, Reichenheim ME. Violence against women, children, and adolescents during the COVID-19 pandemic: overview, contributing factors, and mitigating measures. *Cad Saude Publica.* (2020) 36:e00074420. doi: 10.1590/0102-311x00074420
29. Sotomayor-Beltran C, Matta Solis H, Perez-Siguas R, Matta-Solis E, Matta-Zamudio L. Fear of COVID-19 among peruvian people living in disadvantaged communities: a cross-sectional study. *Clin Pract Epidemiol Ment Health.* (2021) 17:19–25. doi: 10.2174/1745017902117010019
30. Gentile A, De Berardis D, Tomasetti C, Ventriglio A. Digital psychiatry in COVID-19 pandemic: an Italian perspective. *Psychiatry Res.* (2020) 292:113316. doi: 10.1016/j.psychres.2020.113316
31. Smith K, Ostinelli K, Macdonald O, Cipriani A. COVID-19 and telepsychiatry: an evidence-based guidance for clinicians. *JMIR Ment Health.* (2020) 7:e21108. doi: 10.2196/preprints.21108
32. Mattson S, Shearer N, Long C. Exploring telehealth opportunities in domestic violence shelters. *J Am Acad Nurse Pract.* (2002) 14:465–70. doi: 10.1111/j.1745-7599.2002.tb00077.x
33. Jack SM, Munro-Kramer ML, Williams JR, Schminkey D, Tomlinson E, Jennings Mayo-Wilson L, et al. Recognising and responding to intimate partner violence using telehealth: Practical guidance for nurses and midwives. *J Clin Nurs.* (2021) 30:588–602. doi: 10.1111/jocn.15554
34. Goldstein KM, Zullig LL, Dedert EA, Alishahi Tabriz A, Brearly TW, Raitz G, et al. Telehealth interventions designed for women: an evidence map. *J Gen Intern Med.* (2018) 33:2191–200. doi: 10.1007/s11606-018-4655-8
35. Abdo C, Miranda EP, Santos CS, Junior JB, Bernardo WM. Domestic violence and substance abuse during COVID19: a systematic review. *Indian J Psychiatry.* (2020) 62(Suppl. 3):S337–42. doi: 10.4103/psychiatry.IndianJPsychiatry_1049_20
36. Zaami S, Marinelli E, Vari MR. New trends of substance abuse during COVID-19 pandemic: an international perspective. *Front Psychiatry.* (2020) 11:700. doi: 10.3389/fpsyt.2020.00700
37. Wieners K, Winterholler M. Domestic and sexual violence against women. Implications of WHO guidelines for Germany. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz.* (2016) 59:73–80. doi: 10.1007/s00103-015-2260-0
38. Meyer SR, Lasater ME, Garcia-Moreno C. Violence against older women: a systematic review of qualitative literature. *PLoS ONE.* (2020) 15:e0239560. doi: 10.1371/journal.pone.0239560
39. La Cascia C, Cossu G, Lindert J, Ho A, Zreik T, Ventriglio A, et al. Migrant women-experiences from the mediterranean region. *Clin Pract Epidemiol Mental Health.* (2020) 16(Suppl. 1):101–8. doi: 10.2174/1745017902016010101

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 02 July 2021
doi: 10.3389/fpsyt.2021.638272

Victims of the Terrorist Attacks in Belgium and Professional Mental Health Aid Barriers: A Qualitative Study

Roel Van Overmeire[1†], Emilie Muysewinkel[2†], Rose-Lima Van Keer[1], Lara Vesentini[1] and Johan Bilsen[1]*

[1] Mental Health and Wellbeing Research Group (MENT), Department of Public Health, Vrije Universiteit Brussel, Brussels, Belgium, [2] Interuniversity Centre for Health Economics Research (I-CHER), Department of Public Health, Vrije Universiteit Brussel, Brussels, Belgium

OPEN ACCESS

Edited by:
Haim Y. Knobler, Hebrew University of Jerusalem, Israel

Reviewed by:
Freyja Grupp, University of Marburg, Germany
Moshe Z. Abramowitz, Peres Academic Center, Israel

***Correspondence:**
Roel Van Overmeire
roel.van.overmeire@vub.be

[†] *These authors have contributed equally to this work*

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *05 December 2020*
Accepted: *09 June 2021*
Published: *02 July 2021*

Citation:
Van Overmeire R, Muysewinkel E, Van Keer R-L, Vesentini L and Bilsen J (2021) Victims of the Terrorist Attacks in Belgium and Professional Mental Health Aid Barriers: A Qualitative Study. Front. Psychiatry 12:638272. doi: 10.3389/fpsyt.2021.638272

Introduction: Terrorist attacks can cause short and long-term stress-reactions, anxiety, and depression among those exposed. Sometimes, professional mental health aid, meaning all types of professional psychotherapy, would be appropriate, but victims often delay or never access mental health aid, even up to a decade after the initial event. Little is known about the barriers terrorist-victims encounter when they try to access professional mental health aid.

Method: Using a qualitative design, 27 people exposed to the 22/03/2016 terrorist attack in Belgium were interviewed using half-structured, in-depth interviews, on their experiences with professional mental health aid. A reflexive thematic analysis was employed.

Results: Five main barriers for professional mental health aid seeking by victims were found. First, their perception of a lack of expertise of mental health aid professionals. Second, the lack of incentives to overcome their uncertainty to contact a professional. Third, social barriers: people did not feel supported by their social network, feared stigma, or trusted that the support of their social network would be enough to get them through any difficulties. Fourth, a lack of mental health literacy, which seems to be needed to recognize the mental health issues they are facing. Finally, there are financial barriers. The cost of therapy is often too high to begin or continue therapy.

Conclusions: This study showed that the barriers for seeking professional mental health aid are diverse and not easily overcome. More mental health promotion is needed, so that there is a societal awareness of possible consequences of being exposed to terrorist attacks, which might result in less stigma, and a quicker realization of possible harmful stress reactions due to a disaster.

Keywords: mental health, terrorism, access-barriers, post-traumatic stress disorder, victims

INTRODUCTION

A wave of terrorist attacks has struck Europe in recent years: Paris, France on 13/11/2015, Brussels, Belgium on 22/03/2016, Manchester, United Kingdom on 22/05/2017 and even just last year on 19/02/2020 in Hanau, Germany and on 29/10/2020 in Nice, France. Such terrorist attacks can cause short and long-term stress-reactions, anxiety, depression and post-traumatic stress disorder (PTSD) among those directly exposed (1, 2). Furthermore, among the victims of such attacks who can also develop mental health issues, are family members of those directly exposed or killed in such attacks (1, 3). Professional mental health aid (as in professional psychotherapy) can be necessary, but victims of terrorist attacks often delay or never access mental health aid, even up to a decade after the initial event (3–6). This is similar to what has been observed among victims of other forms of trauma (e.g., interpersonal trauma), who also often delay seeking out professional mental health aid (7). Among these victims of other types of trauma, delaying or not accessing mental health care is related to the public knowledge about mental health (i.e., doubts about treatment possibilities), social factors (e.g., stigma) and individual factors such as believing that mental health issues can be solved on their own or financial issues (7, 8). Yet, little is known about the barriers terrorist-victims encounter when they try to access professional mental health aid (9).

Most of what is known about these barriers comes from studies on the 9/11-terrorist attacks in the United States (5, 6, 9–11). These studies found that victims might not access professional mental health aid (i.e., psychotherapy) because of stigma, financial issues, or practical problems (i.e., no time to undergo professional aid).

However, the mental health aid barriers (MHAB) that exist in Europe might be fundamentally different. In contrast to the United States, West-European countries have a universal healthcare system. Because of this, victims of terrorism in Norway, for example, might access mental health care more easily and more often than victims in the United States (3, 12). Bearing in mind the limited literature available on this topic [e.g., (3, 12, 13)], performing sound scientific studies on the MHAB after terrorist attacks in Europe could reveal interesting new perspectives and uncover possible MHAB that might arise after disasters such as terrorist attacks.

In this study we will investigate the MHAB for victims of the 22/03/2016 bombings in the center of Europe, Brussels, Belgium. Belgium has a compulsory health insurance system, which requires that Belgian residents must be affiliated to a sickness fund of their choice. As such, 99% of the population is covered by the health insurance system (14). The mental health care system in Belgium is fragmented, which is part due to the sharing of competences over different policy levels for mental health care (e.g., some parts are managed by federal level, others by the communities). Furthermore, the mental health care system has problems with access and affordable psychotherapy. Finally, while consultations with a psychiatrist are reimbursed, consultations with psychologists have only been reimbursed since March 2019, and this for maximum four visits a year (14).

By investigating the MHAB for victims of terrorism in Belgium, we hope to contribute to an appropriate psychological aid response for victims of terrorism in our country.

MATERIALS AND METHODS

Design

This study focuses on the terrorist attack of 22/03/2016 in Belgium. During the attack, 32 people were killed, and hundreds were wounded through bombings in Brussels airport and a Brussels metro station. Using a qualitative design, participants were interviewed using half-structured, in-depth interviews.

Participants and Recruitment

This study will look deeper into the accessibility of professional mental health care in witnesses and relatives of deceased victims of the terrorist attack on 22/03/2016, as this group is most likely to develop mental health problems (15–17). With professional mental health aid, we refer in this study specifically to psychiatrists, psychologists, and other professionals involved in providing psychotherapy.

Participants were included if:

(1) They were witness to the terror scene or the aftermath in either the airport or the metro station, or relatives to someone who was killed during the attack, which corresponds to criteria of criterion A of PTSD in the DSM-V to assess a traumatic event (18).
(2) They attributed mental, psychosomatic or behavioral changes that they had or have experienced to the attack (e.g., problems sleeping, constant alertness, flashbacks, stomach problems, black-outs, paranoia, et cetera). People were included if, in their opinion, the change interfered with their functioning in several areas of their life, and this change was long-lasting (longer than 1 month). This was based on criteria F and G of the DSM-V definition of PTSD, which state that the problems last longer than a month, and interfere with social, occupational, or other areas of functioning (18).
(3) They were 18 years or older.

People were excluded if they were physically injured during the attack. It is likely those victims might have already had some sort of mental health aid during the rehabilitation of their physical wounds.

To increase variation in the sample, researchers spread information about the study through several organizations (e.g., victim-organizations, Brussels-airport, and rescue worker organizations). Recruitment and interviews took place between June 2018 and February 2019. Thus, this is before visits to psychologists were reimbursed (14).

Interviews were conducted by the primary researcher, RV. RV is a social health scientist with experience in qualitative research. Participants were informed that they would be interviewed by a researcher concerning their experiences during and after the attack in Belgium of 22/03/2016. RV interviewed 27 participants in-depth, comprising 25 witnesses, and two relatives. The sample population includes eight females and nineteen male

respondents. The age ranged between 25 and 60 years old, while the average age was 44.7 years old (see **Table 1**).

Data Collection

A semi-structured interview guide was developed by a multi-disciplinary team, mainly consisting of RV, JB, and R-LV, based on a literature study [e.g., (9, 12)] and the researchers' previous experiences with qualitative interviews with vulnerable groups. The interview guide included topics on their exposure to the attacks, and whether or not they sought out help (see **Table 2**).

Interviews were conducted at a place of the participant's choosing, which was mostly at their home or a meeting room at their work. They were audio-recorded and lasted, on average, minimum 1 h and maximum 2 and a half hours. Afterwards, no transcripts were returned to research participants for feedback or corrections.

Analysis

A reflexive thematic analysis was used, whereby themes and relationships between themes were sought out in the responses of the participants (19). The first step was the familiarization with the data. This was followed by coding of the data, performed independently by RV and R-LV. R-LV is an anthropologist

TABLE 2 | Table of topic list.

1. Description of changes and health in days/weeks/months/years after the attack.
2. When did the victim notice that he/she was experiencing problems?
3. Reaction on these problems?
4. Need for professional aid?
5. Was there professional aid available?
6. How did he/she come into contact with professional aid?
7. How was the experience of accessing professional aid?
8. How would they evaluate the professional aid?

TABLE 1 | Characteristics of sample ID, age, gender, profession, prior problems, and time until seeking help.

ID	Age	Gender	Exposure	Prior problems	Time until seeking help for attack-related problems	Currently on sick leave/different job	Currently still going to therapy
1	39	Female	Witness	None reported	3 months	/	Yes
2	44	Female	Witness	None reported	1 year	/	No
3	44	Female	Witness	None reported	4 months	On leave since the attacks	Yes
4	55	Female	Witness	Burn-out	1–2 weeks (was already in treatment for burn-out)	Working part time since the attacks	Yes
5	57	Male	Relative	None	3 months	On sick leave since attack	Yes
6	50	Female	Relative	None	3 months	Part-time due to attacks	Yes
7	58	Male	Witness	None	3 months	/	No
8	43	Male	Witness	None	1 month	/	No
9	40	Female	Witness	Involved in violent shooting	7 months	On sick leave	Yes
10	43	Female	Witness	Depression	9 months	On sick leave	Yes
11	54	Male	Witness	Involved in violent shooting	1–2 weeks	Had to change job	Yes
12	56	Male	Witness	None	6 months		No
13	44	Male	Witness	None	1 year, 2 months		No
14	59	Male	Witness	Work-accident	4 months	On sick leave	Yes
15	29	Female	Witness	None	1–2 months	/	Yes
16	40	Male	Witness	Burn-out	1 year	Changed job	Yes
17	25	Male	Witness	None	3 months	/	No
18	30	Male	Witness	None	1–2 weeks	/	No
19	47	Male	Witness	None	/	/	/
20	32	Male	Witness	None	/	/	/
21	55	Male	Witness	None	/	/	/
22	48	Male	Witness	None	/	/	/
23	30	Male	Witness	None	/	/	/
24	48	Male	Witness	None	/	/	/
25	28	Male	Witness	None	/	/	/
26	48	Male	Witness	None	/	/	/
27	60	Male	Witness	None	1 year	Has started working less	Yes

/, not started professional mental health.

and has a PhD in social health sciences, with an expertise in qualitative research. Coding was performed in NVivo 12.0. To allow a higher intercoder reliability, differences in coding were discussed between R-LV and RV until an agreement of coding was reached. Based on this coding, general themes were sought out. These themes were developed based on the codes that were found, thus allowing more reflexivity in what was found, due the themes not being decided in advance (19). The resulting themes were discussed between R-LV, RV, JB, EM, and LV, which included the discussion of the defining and naming of the themes.

Ethics

All participants were sufficiently informed about the study (e.g., the purpose), their rights (e.g., the guarantee of their privacy), and potential aid channels (e.g., helplines and psychologists), after which they gave their written consent to participate in the study. Information related to the identity of the participants was removed from transcripts as much as possible (e.g., names, address, et cetera). All coded transcripts were saved on a secured server of the Vrije Universiteit Brussel (VUB), to which all authors are affiliated. Furthermore, this study was approved by the Commission Medical Ethics of the UZ Brussels/VUB (B.U.N. 1430201836125).

RESULTS

Five participants reported mental health problems that had existed prior to the terrorist attack. Two participants reported burnouts, two traumatic stress reaction, and one depression (see **Table 1**; column "prior problems").

The results showed that 19 participants pursued therapy on a consistent basis after the terrorist attack, though one of them (ID 18) only went once. For all these participants, the therapy was related to the experience of the attacks. Twelve participants still attended therapy at the time of the interview. Of the latter, five participants are registered on sick leave since the attack. There were only six participants out of 27 able to identify the type of therapy they received (all EMDR-therapy).

All participants faced professional mental health aid barriers, whether or not they eventually got professional mental health aid. Eight participants had not started professional mental health aid at the time of the interviews.

Overall, five main mental health aid barriers were found: lack of expertise of mental health aid professionals, lack of personal incentives, social barriers, mental health literacy barriers, and financial barriers.

Lack of Expertise of Mental Health Aid Professionals

This barrier concerns how, in this case, participants negatively view mental health professionals' expertise and understanding.

Perceived Lack of Expertise of Professionals

Most victims got some form of "first mental health aid" in the week(s) after the attack: ambulatory visits to psychologists at the Center of Mental Well-being (CAW, in Dutch) or visits from crisis-psychologists at work. However, almost all participants denied the professional help offered. Reasons were diverse: a perceived lack of expertise (e.g., the professionals were perceived to be too young to have the proper experience or perceived not having the proper training), in one case, social support felt more helpful.

> *'To me, there is no Victim Aid (the institution that helps people after traumatic events). There are people that mean something – maybe – on paper. Like "Pretend you know something!" (laughs). We got people, but they don't know anything – how would they? They're not trained for this. We had to help them (the people from Victim Aid) when they came*' (ID 5).

This perceived lack was also noticed in the search for proper therapy. Certain participants in the sample ended up with a psychologist or psychiatrist that were unsuited to their needs. Some victims explained that finding a suitable therapist is difficult because there are too few experienced therapists in trauma-care. In addition, there is no proper way to find out who is specialized in trauma-care.

> *'[Therapists] aren't prepared for something like this. And I think there's a huge gap there, both with victim support as with psychologists, that there isn't a specialization in trauma-care. It doesn't exist… […] The processing of the death of B. (deceased) becomes a side issue, you know, they work on other domains, and that's where the problem is, and you feel they don't really know what to do with it' (ID 6).*

Perceived Lack of Understanding of Professionals

Some participants acknowledged to feel a lack of connection with the health provider and preferred talking to fellow victims because of the shared experience. This means that therapists cannot understand the experience of being in a terrorist attack, unless they have experienced it as well, and thus cannot properly help the victims.

> *'I went there (to a psychologist) myself on a certain moment, just to see, look, am I right (that therapy cannot help)? I said a few things, this and that is my problem and I got as answer "Yeah, that's normal, if you still have it in 3 months, come back again". That's the answer of those professionals. I was kind of disappointed, but yeah, I think – you hear colleagues say, "Those people, they can't help, because they do not understand". I just went there to test that prejudice*' (ID 18).

Lack of Personal Incentives

Eight participants never sought out help, regardless of the offered mental health aid. Among these, there were three that wished they had contacted professional mental health aid but did not. Reasons mentioned were the uncertainties, the threshold of contacting a professional solely by themselves, but also the fear of confrontation with what they felt during and after the terrorist attacks.

> *'Sometimes, it's still difficult. […] I don't know with who or what I can talk to about it. […] There were mails, saying that you could contact a number – in the first period, day and night, and you could*

get into contact with a psychologist. But, like I said, I don't know with who I would come into contact with that number, so I never called' (ID 19).

Someone who had delayed seeking out professional mental health aid for 4 months, recalled the personal barriers she experienced.

'I thought long about that (going to therapy). But to do it… Then you have to take the step to be involved with that. And that's what was hard for me, to be occupied with that. Because – you get confronted again with everything. And, just, you know, if you do it, it's going to be tough, and taking the step on your own to go is already tough. So yeah, you got to do it all again on your own, you know' (ID 3).

Social Barriers

Additionally, people are influenced by their environment: family, friends, colleagues. Their reactions or lack of them can also act as a barrier. This translates itself in the way a lack of support by friends and family to seek out help, the trust in the social support or stigma can become mental health aid barriers.

Lack of Support by Friends and Family

Interviews showed that almost none of the members of participants' social support network advised them to seek professional help, in part because their social network tried to ignore the events happened. This let participants to believe they could handle their mental health issues, since nobody in their surrounding outed any concern.

'After that we just went back to work, and that was it… It was like "It happened, and life goes on". It was almost like taboo. […] So, when I went to the doctor, and he asked if everything was okay, I didn't even dare to say 'No, everything is not okay', because you get so little support, and it makes you think "I actually don't want any misery, everything is okay". And so, he gave me an okay to work' (ID 10).

'I have always kept for myself. Like, I talked about (my problems) with a few people, but then you hear "Yeah, but that's normal, after what you have been through", while I thought "Huh, that isn't normal… Or maybe it is, and I'm wrong?" It was very confusing' (ID 2).

In a couple of cases, participants had to go on sick leave, leading to members of their social environment confessing to have received earlier signs of mental distress within the victims.

'*Then (after going to a mental health aid practitioner) you hear remarks like, "It had to happen, you have to break sometime, you can't be a tough guy all the time, everybody has to go under sometime*"' (ID 12).

Stigma

Stigma played a role for a lot of victims in the pursuit of a professional. Some victims confirmed that psychological problems and therapy were indeed connected with stigma. For example, they did not want to admit they had mental health problems because they might appear to be weak or found mental health problems in general to be dubious and/or an excuse.

'Everybody has a right on a burn-out these days. There was someone who had to do administrative tasks, and he was suddenly gone: burn-out… And then you get your own mental problems, and you think, they're going to compare me with that guy. You're there with REAL problems, and someone else… So, yeah, psychosocial wellbeing, it has a dirty side to it' (ID 16).

'Psychological problems are still taboo. Nobody wants to get out and show that they go to a psychologist, almost nobody wants to admit they use Sipralexa or another product. You know, since I have openly said that I take it, that there are 4 mothers who admitted to taking Sipralexa. What the fuck? I don't hide it anymore. Sure, the good old Flemish way, but goddamnit, they can see how a person goes through the dirt too. […] Inner scars, you can't see those' (ID 9).

In addition, one male participant suggested a possible link between stigma and differences in generations as a reason for never seeking professional aid.

'I don't think anyone will dare to ask that (for mental health aid). It will be until the next generation of millennials – they tend to be more inclined to being emotional. […] Showing emotions, yeah, it – it's seen as weak' (ID 26).

Trust in Social Support

Interviews revealed that victims not always desired mental help, as they wanted to handle their own problems through talking with friends and family. Some felt it was enough to process the events. This was not related to their perception of a possible lack of understanding or expertise of professionals. These participants felt that they were able to solve any problems they might have on their own. Though this might be connected with stigma, it was not obvious and had perhaps more to do with not wanting to be dependent on other people.

'I never went (to the psychologist). I'm not like that. I always try to do it on my own, yeah. […] I think so (that it worked to handle it on his own). By talking about it, with family and friends. I tried to process it like that' (ID 23).

Some who did seek out professional mental health aid, but were disappointed, also trusted in their social support.

'(My psychologist) had his own problems. I did one session, paid 50 euros, to play psychologist myself. His child had died the year before on the day I came, and I started listening to his story. So… I got through it with the help of the people around me. I have a lot of luck with my friends, they're golden, really good friends and they're always there for me' (ID 15).

Barrier Due to Mental Health Literacy

Due to a lack of knowledge of mental health consequences of large-scale disasters, some respondents postponed searching for help. This was partly due to an underestimation of the problems they were experiencing, and a lack of knowledge of post-traumatic stress disorder.

Knowledge of PTSD

PTSD was for a few participants a whole new concept, including the symptoms related to traumatic events. This seemed to have been a barrier in acknowledging the need for help. While they associated their problems with the attack, they only faced the seriousness of their problems once it was linked to a medical condition whether or not diagnosed by a medical professional (e.g., PTSD).

> *'And then the doctors finally diagnosed that it was post-traumatic stress syndrome. But someone who doesn't have it, can't understand it. I have read a lot about it now, but I had never heard from it before, from that post-traumatic – but you hear the same stories everywhere, the same complaints of people who get little sympathy. Because if you don't have it, you can't understand, impossible'* (ID 11).

Delayed Realization

Most participants reported increased aggression, long-lasting sleeping problems, paranoia, constant alertness, black-outs, loss of concentration and in some cases, psychosomatic complaints. However, participants confessed to postpone searching for help regarding their problems, because they often denied or underestimated the scope of their problem(s). In some interviews, a moment of realization of their problems was recounted as: "*This is not me*." Up until that point victims tended to go about their day as though nothing had happened. This occurred in people without any experience with mental health providers, as well as in participants with previous encounters.

> *'So, we go there (to a mall), and at a certain moment I saw a movement, and then (a child screamed) "Mommy, mommy, mommy", and those were Americans. And that sounded exactly the same (it remined him of the child he saw sitting next to her/his death mother in the airport after the attack). That was like getting hit in the face, I didn't see anything anymore, I was completely gone, I only saw that mother lying there – from then on they started with EMDR, because they told me "You really need it, man"'* (ID 14).
>
> *'I got guns at home, and there was screaming on the square in my village, and I thought, what's going on here? So, I took my gun and ammunition, was waiting by the door, and thought, if someone comes in here… But it was nothing. And then I said to myself: "Maybe I should talk with a psychologist"'* (ID 17).

Financial Barriers

Because of the financial costs of mental health aid, or reimbursement problems for the suffered damages after the terrorist attack, participants experience difficulties accessing or continue accessing mental health care.

Financial Costs

During the interviews, some victims mentioned the cost of psychologic therapy as a reason for limited or no accessibility to mental health aid. In almost every case, this regarded to psychologists, as psychiatrists are reimbursed by the health insurance funds in Belgium. Patients' preference to seek help from a psychologist (viewed as a mental health professional that listens to patients), rather than a psychiatrist (perceived to be only prescribing medicine), forms an additional insight, and makes financial costs a relevant barrier.

> *'So, I just went to get 5 sessions of EMDR. And that helped - kind of. But not enough to like function normally. Ehm… Then there was a problem with those sessions, you know, it was a trauma psychologist, they're not reimbursed, and so that was 100 euros per session. So, in a week, I went 5 times, or in two weeks, and that was 500 euros. That's a lot, at least for me. I couldn't keep doing that, so I stopped it. I thought it'd be okay, but it wasn't'* (ID 11).

Insurances

Half of the people in the sample encountered insurance problems: a lack of reimbursement due to inadequate invalidity-ratings from insurance doctors, difficulties in reading the insurance papers (e.g., in French, or unreadable because of legal jargon), receiving a different diagnosis from the insurance doctor or not getting recognized as a victim of a terrorist attack. The latter leads to increased pressure on the individual's finances and leads to problems in accessibility of mental health care.

> *'It is confronting and difficult that you get into a situation where your child died and was actually killed, but you still have to prove that (he/she) is a victim. And that you yourself are a victim. And then you find the hardness of insurance companies, who of course think about their own wallet'* (ID 6).

The interviews of some participants reflect a reluctance to filling out insurance paperwork. Some attributed this feeling to a sense of reliving the situation when completing those forms. While others found the insurance paperwork solely too complex in order for them to fill them out.

> *'You have to make an estimation of the costs. Yeah, but how can you know beforehand? All those medical costs? And I think that the insurances handled that way too quickly. I mean, for us – it might not be financial problem, because we have money, but others without a doubt will have problems. Yeah… People just have to find their way on their own, which basically means the insurances want to ignore them (because the process is so complex and difficult). I just filled in the papers – they have been here for a half a year, because it was just so intimidating, like "How do I start this?"'* (ID 2).

DISCUSSION

As far as we know, this study is the first study attempting to provide more insight in professional mental health aid barriers for victims of terrorist attacks, using a qualitative design. Over the course of 27 interviews, a wide variety of reasons were found as to why victims of terrorist attacks may oppose seeking mental health care or continuing seeking mental health care. It became quite clear there is an overall lack of awareness of mental health problems in this context. Victims feel held back by stigma, their social environment, a lack of personal incentives, financial problems, their lack of mental health knowledge, or just prefer to handle their problems on their own. It also appears multiple barriers can arise within one individual.

As in other studies, social support played an important role in accessing professional help (5). While some findings in this study point to the positive role social support can play in accessing mental health aid, there is also clear evidence of victims holding back of reaching out for professional help, due to their social environment. A possible explanation for this phenomenon can be attributed to the conflict between one's own awareness of mental health concerns and the necessary acknowledgment of the mental health concerns by family and friends to initiate the search for professional care. Such lack of acknowledgment of important loved ones may also explain why other studies found that many victims opt to handle their own problems (9).

In addition, psychological trauma-related symptoms are not directly connected to seeking help of a mental health professional (20). Even although participants confessed to be aware of one's problems, they admitted it took some time before they really acknowledged the severity of their condition. A possible reason might be their lack of mental health literacy to correctly assess mental problems. As a consequence, they tried to uphold the social role they employed before the attack (e.g., tried to continue work, be mother, etc.). Only the severe impairment of their social roles by their mental health issues (e.g., break-down due to flashback, or almost shooting someone because of the increased perception of threat), gives them the incentive to go to psychotherapy.

The role of the universal healthcare system is complex. As Stene and Dyb (12) pointed out, access to specialized aid in countries such as Belgium is less income-driven compared to countries such as the United States. It is true that psychiatrists are reimbursed in Belgium. However, this was not the case for psychologists at the time of data-collection, which ended in February 2019. Since March 2019 psychologists are reimbursed, but only for a maximum of four times a year (14). This is problematic as psychiatrists are often perceived as the ones people consult specially to get their prescribed medication, while psychologists are the actual specialists with whom they can share their burden (and hope to solve their problems via psychotherapy). Thus, while the universal healthcare system portraits an accessible institution in terms of costs, people often are limited in finding affordable mental health service in terms of an emotional connection. Additionally, insurance companies in Belgium play a dubious role in supporting victims of terrorist attack in seeking help. Besides not giving the full financial compensation to stimulate victims' mental health aid seeking behavior, insurance companies are even entitled to refuse any recognition to victims' problems, which then creates an extra mental barrier of recovery (21). Victims then feel as if the experience is downplayed as well as their correlated problems, ultimately leading to stigma, a previously mentioned barrier in seeking mental health aid, resulting in even more problems for the individual.

Furthermore, a structural barrier exists due the lack of knowledge in Belgium on the long-term relationship between mental health issues and disasters. First, different from some other countries such as the U.S., where PTSD is culturally a widespread concept (22), the initiatives regarding trauma care in our country are relatively new (23). Second, there is no record of a certified and publicly accessible network of psychotrauma therapists, as stated in the report on the attacks of 26/03/2020 by the Belgian Federal Government (24), which makes it practically significantly more difficult to find suitable mental health care. Also, other authors point to the importance of knowing one's way through the sometimes complex mental health aid network in finding smoothly the right care when needed (9, 10).

Given this insight, regardless of the information spread proposing therapy treatments for people dealing with the consequences of a traumatic experiences (e.g., cognitive-behavior therapy or EMDR-therapy), this knowledge seldom finds its way to public health studies or policy (25). The consequences of a gap in knowledge might manifest itself in consulting unexperienced or underqualified psychologists or psychiatrists, who might not be able to properly diagnose a disorder. Yet, gaining recognition for possible post-traumatic symptoms is important for victims (26).

The first recommendation based on this study is to invest as society in more profound and adequate mental health promotion. This should include the fact that the majority of people exposed to traumatic events do not develop mental health issues of any kind. If immediate emotional reactions do occur, they mostly fade over a timespan of 1 month (e.g., acute stress disorder). The latter entails there is no point in publicly advocating the necessity for everyone exposed to terroristic attacks to seek out mental health aid (22). People, in general, are far more resilient than most studies acknowledge (27). Thus, such campaigns should be aimed at awareness of possible long-term problems, but that short-term reactions are normal. Furthermore, while there is often a focus on long-term disorders such as PTSD, other diagnoses are still possible after such disasters, such as depression or anxiety disorders (5).

A second recommendation can be made regarding the need of more available centers for victims of traumatic events. France has already integrated such a center for victims of trauma (28), while in the United States there is Project Liberty, a large intervention program established after 9/11 (29). This project has shown to increase service access in vulnerable groups (30). Centers such as the Project Liberty not only support victims, but also contribute to informing them on mental health consequences (31). This is not to say that Belgium goes without any centers for victims of traumatic events, such as e.g., the "Health center after sexual violence" (in Dutch: "Zorgcentrum na Seksueel Geweld" linked to the University Hospital of Ghent). However, there remains in gap for general traumatic events. In term of costs impact, it seems also in the best interest of our society to invest in such centers compared to the costs of employees on sick-leave due to mental health issues, or the costs of long-term psychiatric care. Such centers have the great advantage that those exposed do not have to see different therapists to find a suitable therapy, as these centers have the necessary information, and the most suitable, evidence-based therapy. Furthermore, these centers being publicly known, improves to combat the stigma that might be associated with the mental health problems. The need for such centers for an event such as terrorist attacks, is confirmed by the victim-support groups that have arisen after the 22/03/2016 attacks in Belgium (e.g., V-Europe, Life4Brussels…).

This study entails several limitations. A recall bias is possible as the interviews took place 2.5–3 years after the attacks in Belgium (22/03/2016). Furthermore, the uneven distribution among our participants of gender, with a majority of men, could possibly have affected the reported results. Third, only two relatives of people who died during the attack could be included in our research population, despite the fact that relatives can provide more insights. Fourth, education level plays a role in knowledge about the mental health care landscape, but was not included in this study. Nevertheless, this study does embark on in-depth information regarding an underexposed topic, namely mental health aid barriers after terrorist attacks.

To conclude, the insights of this study could provide a positive incentive to form an adequate psychological support framework for victims of terrorist attacks in Belgium and other European countries. The goal of further research should not only be to investigate the possible necessary political interventions in context of mental health and terroristic attacks, but also increase the focus on constructing more resilience.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by UZ Brussels/VUB Ethics Committee. The patients/participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

RV and R-LV analyzed the data. RV and EM wrote first draft together. All authors contributed to the discussion of the themes. All authors read and corrected the drafts.

FUNDING

This research was funded by Innoviris, the Brussels Institute for Research and Innovation in Belgium (BRGPRO1).

ACKNOWLEDGMENTS

We wish to thank the victims of the attacks of 22/03/2016 in Belgium for their time.

REFERENCES

1. Galea S, Ahern J, Resnick H, Kilpatrick D, Bucuvalas M, Gold J, et al. Psychological sequelae of the September 11 terrorist attacks in New York City. *N Engl J Med.* (2002) 346:982–7. doi: 10.1056/NEJMsa013404
2. Jordan HT, Osahan S, Li J, Stein CR, Friedman SM, Brackbill RM, et al. Persistent mental and physical health impact of exposure to the September 11, 2001 World Trade Center terrorist attacks. *Environ Health.* (2019) 18:12. doi: 10.1186/s12940-019-0449-7
3. Haga JM, Thoresen S, Stene LE, Wentzel-Larsen T, Dyb G. Healthcare to parents of young terrorism survivors: a registry-based study in Norway. *BMJ Open.* (2017) 7:e018358. doi: 10.1136/bmjopen-2017-018358
4. Rodriguez JJ, Kohn R. Use of mental health services among disaster survivors. *Curr Opin Psychiatry.* (2008) 21:370–8. doi: 10.1097/YCO.0b013e328304d984
5. Ghuman SJ, Brackbill RM, Stellman SD, Farfel MR, Cone JE. Unmet mental health care need 10-11 years after the 9/11 terrorist attacks: 2011-2012 results from the World Trade Center Health Registry. *BMC Public Health.* (2014) 14:491. doi: 10.1186/1471-2458-14-491
6. Jacobson MH, Norman C, Sadler P, Petrsoric LJ, Brackbill RM. Characterizing Mental Health Treatment Utilization among individuals exposed to the 2001 World Trade Center Terrorist Attacks 14–15 Years Post-Disaster. *Int J Environ Res Public Health.* (2019) 16:626. doi: 10.3390/ijerph16040626
7. Schreiber V, Maercker A, Renneberg B. Social influences on mental health help-seeking after interpersonal traumatization: a qualitative analysis. *BMC Public Health.* (2010) 10:634. doi: 10.1186/1471-2458-10-634
8. Kantor V, Knefel M, Lueger-Schuster B. Perceived barriers and facilitators of mental health service utilization in adult trauma survivors: a systematic review. *Clin Psychol Rev.* (2017) 52:52–68. doi: 10.1016/j.cpr.2016.12.001
9. Stuber J, Galea S, Boscarino JA, Schlesinger M. Was there unmet mental health need after the September 11, 2001 terrorist attacks? *Soc Psychiatry Psychiatr Epidemiol.* (2006) 41:230–40. doi: 10.1007/s00127-005-0022-2
10. Stein BD, Elliott MN, Jaycox LH, Collins RL, Berry SH, Klein DJ, et al. A National Longitudinal Study of the psychological consequences of the September 11, 2001 terrorist attacks: reactions, impairment, and help-seeking. *Psychiatry.* (2004) 67:105–17. doi: 10.1521/psyc.67.2.105.35964
11. Gagin R, Cohen M, Peled-Avram M, Unger-Arnov Y, Adir O, Tessler A. An ongoing, multi-faceted program for victims of terror attacks and their families. *Int J Emerg Ment Health.* (2007) 9:193–200.
12. Stene LE, Dyb G. Health service utilization after terrorism: a longitudinal study of survivors of the 2011 Utoya attack in Norway. *BMC Health Serv Res.* (2015) 15:158. doi: 10.1186/s12913-015-0811-6
13. Vandentorren S, Pirard P, Sanna A, Aubert L, Motreff Y, Dantchev N, et al. Healthcare provision and the psychological, somatic and social impact on people involved in the terror attacks in January 2015 in Paris: cohort study. *Br J Psychiatry.* (2018) 212:207–14. doi: 10.1192/bjp.2017.63
14. Gerkens S, Merkur S. Belgium: health system review. *Health Syst Trans.* (2020) 22: i—237. Available online at: https://apps.who.int/iris/handle/10665/339168.
15. Liu B, Tarigan LH, Bromet EJ, Kim H. World Trade Center disaster exposure-related probable posttraumatic stress disorder among responders and civilians: a meta-analysis. *PLoS ONE.* (2014) 9:e101491. doi: 10.1371/journal.pone.0101491
16. Shear KM, Jackson CT, Essock SM, Donahue SA, Felton CJ. Screening for complicated grief among Project Liberty service recipients 18 months after September 11, 2001. *Psychiatr Serv.* (2006) 57:1291–7. doi: 10.1176/ps.2006.57.9.1291
17. Laugharne J, Janca A, Widiger T. Posttraumatic stress disorder and terrorism: 5 years after 9/11. *Curr Opin Psychiatry.* (2007) 20:36–41. doi: 10.1097/YCO.0b013e328010dc2c
18. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders.* Washington, DC: American Psychiatric Publishing (2013). p. 947. doi: 10.1176/appi.books.9780890425596
19. Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qual Res Sport Exerc Health.* (2019) 11:589–97. doi: 10.1080/2159676X.2019.1628806
20. Stene LE, Wentzel-Larsen T, Dyb G. Healthcare needs, experiences and satisfaction after terrorism: a longitudinal study of survivors from the Utoya attack. *Front Psychol.* (2016) 7:1609. doi: 10.3389/fpsyg.2016.01809
21. Maercker A, Müller J. Social acknowledgment as a victim or survivor: a scale to measure a recovery factor of PTSD. *J Trauma Stress.* (2004) 17:345–51. doi: 10.1023/B:JOTS.0000038484.15488.3d

22. Durodié B, Wainwright D. Terrorism and post-traumatic stress disorder: a historical review. *Lancet Psychiatry.* (2019) 6:61–71. doi: 10.1016/S2215-0366(18)30335-3
23. Schäfer I, Hopchet M, Vandamme N, Ajdukovic D, El-Hage W, Egreteau L, et al. Trauma and trauma care in Europe. *Eur J Psychotraumatol.* (2018) 9:1556553. doi: 10.1080/20008198.2018.1556553
24. *FOD Volksgezondheid, veiligheid van de voedselketen en milieu*. Technische werkgroep: Psychosociale opvolging: voor een geïntegreerde psychosociale opvolging van getroffenen van collectieve noodsituaties (2018). Available online at: https://healthpr.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/visietekst-printversie.pdf (accessed May 16, 2021).
25. Kieber RJ Trauma and public mental health: a focused review. *Front Psychiatry.* (2019) 10:451. doi: 10.3389/fpsyt.2019.00451
26. Friedman-Peleg K, Goodman YC. From posttrauma intervention to immunization of the social body: pragmatics and politics of a resilience program in Israel's periphery. *Cult Med Psychiatry.* (2010) 34:421–42. doi: 10.1007/s11013-010-9187-6
27. Bonanno GA. Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *Am Psychol.* (2004) 59:20–8. doi: 10.1037/0003-066X.59.1.20
28. El-Hage W, Birmes P, Jehel L, Ferreri F, Benoit M, Vidailhet P, et al. Improving the mental health system for trauma victims in France. *Eur J Psychotraumatol.* (2019) 10:1617610. doi: 10.1080/20008198.2019.1617610
29. Jackson CT, Allen G, Essock SM, Foster MJ, Lanzara CB, Felton CJ, et al. Clusters of event reactions among recipients of Project Liberty mental health counseling. *Psychiatr Serv.* (2006) 57:1271–6. doi: 10.1176/ps.2006.57.9.1271
30. Donahue SA, Covell NH, Foster MJ, Felton CJ, Essock SM. Demographic characteristics of individuals who received Project Liberty crisis counseling services. *Psychiatr Serv.* (2006) 57:1261–7. doi: 10.1176/ps.2006.57.9.1261
31. Stuber JP, Galea S. Barriers to mental health treatment after disasters. *Psychiatr Serv.* (2005) 56:1157–8. doi: 10.1176/appi.ps.56.9.1157

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 05 July 2021
doi: 10.3389/fpsyt.2021.600456

Violent Behavior Prior to Admission Is Not a Factor in Further Prolonged Length of Stay: A Retrospective Cohort Study in a Japanese Psychiatric Hospital

Hidetoshi Kinoshita[1,2]*, *Noriomi Kuroki*[1] *and Takayuki Okada*[2]

[1] *Department of Psychiatry, Tokyo Metropolitan Matsuzawa Hospital, Tokyo, Japan,* [2] *Forensic Mental Health Unit, Department of Psychiatry and Behavioral Sciences, Division of Cognitive and Behavioral Medicine, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Tokyo, Japan*

OPEN ACCESS

Edited by:
Haim Y. Knobler, Hebrew University of Jerusalem, Israel

Reviewed by:
Athanassios Douzenis, National and Kapodistrian University of Athens, Greece
Anna Maria Dåderman, University West, Sweden
Christos Theleritis, King's College London, United Kingdom

***Correspondence:**
Hidetoshi Kinoshita
hidetoshi_kinoshita@tmhp.jp

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *14 September 2020*
Accepted: *01 June 2021*
Published: *05 July 2021*

Citation:
Kinoshita H, Kuroki N and Okada T (2021) Violent Behavior Prior to Admission Is Not a Factor in Further Prolonged Length of Stay: A Retrospective Cohort Study in a Japanese Psychiatric Hospital. Front. Psychiatry 12:600456. doi: 10.3389/fpsyt.2021.600456

Background: This study assessed the hypothesis that violent behavior prior to admission prolongs psychiatric hospitalization and evaluated the likelihood of hospital discharge to a community care setting based on demographic and clinical factors, with an emphasis on violent behavior.

Methods: We retrospectively selected 362 patients who were involuntarily admitted to a psychiatric hospital in Japan from December 1, 2015 to November 30, 2017, stayed longer than planned, and underwent review by a multidisciplinary team. We assessed (a) education and marital status and history of substance abuse, (b) the presence/absence and type of violent behavior that led to hospital admission, and (c) the discharge criteria. We divided the subjects into groups according to whether they had demonstrated violent behavior prior to admission and compared demographic and clinical variables between the groups using bivariate analysis. We also analyzed data using the Cox proportional hazard model, defining discharge to the community as the outcome. Age, sex, and variables that were significant at a level of $P < 0.05$ based on Cox univariate analysis were included in the multivariate models using the forced entry method.

Results: The Violent group included 94 patients (26%). There were no significant between-group differences in age, sex, educational background, marital history, career history, or the history of substance abuse. However, hospitalization was significantly longer in the Non-violent group. The Cox proportional multivariate hazard ratios revealed that violent behavior prior to admission resulted in a higher probability of hospital discharge.

Conclusion: Violent behavior prior to admission did not significantly contribute to prolonged hospitalization in patients who deviated from the treatment plan and had exceeded the planned hospitalization duration. Our findings recommend caution when using violence and impulsiveness observed during the acute stage to predict the difficulty of long-term treatment.

Keywords: length of stay, deinstitutionalization, general psychiatry, Asia, Japan, violent behavior

INTRODUCTION

"Deinstitutionalization," or promoting patient-centered psychiatric treatment by transferring the site of treatment to the community, has become a global trend (1). Long-term hospitalization has been identified as being problematic and is increasingly regarded as a practice that should be avoided. Mattes et al. have suggested that long-term hospitalization might not reduce subsequent admissions and does not clearly improve a patient's adaptation to society or reduce his/her psychopathology (2). Researchers have also pointed out that the costs associated with treatment of patients inappropriately admitted to a hospital greatly surpass the costs of community-based care (3). Therefore, the prolongation of hospitalization should also be avoided from an economic perspective. Sood et al. found that long-term hospitalized patients had a significantly poorer functioning, especially in self-care and domestic skills, compared with discharged patients (4). This suggests that staying in a hospital's sheltered environment for long periods of time comes with the risk of deterioration of patients' living and coping skills. Moreover, one study found that short-term hospitalization does not lead to "revolving door"-type hospitalization, or to low-quality or fragmented care (5).

Psychiatric hospital stays are more commonly prolonged in Japan than in other countries, and the environment of hospitalization wards and the community surrounding the psychiatric hospital is unique. There are approximately four times more beds (269 beds vs. 68 beds per 100,000 people) for psychiatric patients in Japan compared to the Organisation for Economic Co-operation and Development (OECD) average. These hospital beds continue to be used for the recuperation of chronic-stage patients (1). This is one of the reasons for which the length of stay in psychiatric hospitals in Japan is excessively long compared to that in European and American countries. Much like other countries, Ministry of Health, Labor and Welfare in Japan recommends that hospital stays are shortened. In 2004, the government launched a policy for shifting from hospital treatment to community-based care. Since the launch of this plan, the number of hospitalization days of newly admitted psychiatric patients has shown a decreasing trend. However, there still are over 50,000 patients per year who remain hospitalized for more than a year. In 2014, the government launched a policy that aimed to discharge patients from psychiatric wards within 1 year (6). It is becoming an increasingly important challenge to identify factors associated with longer hospitalization in Japan, where hospital stays already tend to be prolonged, and to consider actions to counter this problem.

It is important to focus on the factors that cause prolonged hospitalization and to continue to implement programs and actions designed to shorten hospital stays. Although it seems to be difficult to define which factors result in longer hospital stays, as Newman et al. have suggested that length of stay is likely to be multifactorially determined (7), attempts have been made to identify the factors related to the length of stay in psychiatric hospitals. For example, previous work has found that an older age is associated with a longer hospital stay (8–12). It is still unclear how sex is related to the length of hospital stay (7, 8, 13, 14). Psychotic disorder and mood disorder have been associated with longer stays (7, 12, 15–17), while personality disorder (11, 18), substance abuse (11, 13, 18), and adjustment disorder (18) have been associated with shorter stays.

Broderick et al. have reported that the number of episodes of physical violence during hospitalization lengthens hospital stay (19). On the other hand, Greenfield et al. have reported that violence itself is not a predictive factor for hospitalization (16). There are clear differences between reports on how violence is related to the length of hospital stay, and no uniform views have yet been achieved. From our clinical experience, violent patients seem to cause panic among healthcare staff, prevent therapeutic interventions, have more prominent mental symptoms, and narrow their post-discharge options. Therefore, we included the history of violent behavior in the factors potentially related to length of stay.

We hypothesized that violent behavior prior to admission is an important factor that affects the occurrence of discharge, and that patients with violent behavior continue to stay in the hospital for longer periods than patients without violent behavior. The purpose of this study was to explore factors that affect discharge and to evaluate the likelihood of hospital discharge to a community care setting based on a suite of demographic and clinical factors, with an emphasis on violent behavior.

METHODS

Study Design and Setting

This retrospective cohort study was carried out at Tokyo Metropolitan Matsuzawa Hospital, Setagaya Ward, Tokyo, Japan. Tokyo Metropolitan Matsuzawa Hospital is a large-scale and long-established mental hospital with 808 psychiatric beds. The inpatient facility comprises 22 wards equipped with diverse functions. According to the 2018 statistics, the hospital had ∼93,600 outpatients and returning patients per year, with 2,700 inpatients (20, 21). Patients with relatively severe symptoms are more likely to visit its outpatient clinic for treatment than clinics and private psychiatric hospitals. Patients may be admitted voluntarily at their own request. However, there also are cases where obtaining consent for admission is difficult, due to the influence of diverse psychiatric symptoms. In Japan, these patients may be admitted, even without their consent, after undergoing examination by mental health doctors designated by the Minister of Health, Labor and Welfare, if they are judged as requiring hospitalization, and if family members give their consent. This involuntary admission is specified under the Act on Mental Health and Welfare for the Mentally Disabled (22).

Upon involuntary admission, the doctor in charge specifies the planned treatment and the expected duration of hospitalization according to a predetermined format, explains it to the patient or family, obtains their consent, and stores it in their medical record. The planned lengths of hospitalization usually do not exceed 1 year. Patients who deviate from the plan and exceed the planned hospitalization duration undergo

Abbreviations: ECT, Electroconvulsive Therapy; OECD, Organisation for Economic Co-operation and Development.

a review by a multidisciplinary team comprising physicians, nurses, and social workers.

Participants

We selected subjects from the 4,729 patients who had been admitted to the Department of Psychiatry in Tokyo Metropolitan Matsuzawa Hospital from December 1, 2015 to November 30, 2017. We enrolled participants who, despite being hospitalized for medical care and protection, had exceeded their initially anticipated hospitalization period and had undergone a review by an inter-disciplinary team.

We selected only those patients who had been admitted involuntarily and had undergone an assessment of their needs toward discharge; namely, patients who deviated from the treatment plan established at admission and had exceeded the planned hospitalization duration. Patients discharged within the anticipated period were not selected as subjects. Furthermore, it was deemed inappropriate to include patients undergoing hospitalization for rest/recuperation purposes, wherein the patients could themselves choose the length of their hospital stay, or patients whose duration of hospitalization had already been predetermined.

The exclusion criteria were missing records, such as an insufficient summary (17 patients), as well as the second and subsequent admission of patients who had been hospitalized multiple times during the period (eight patients). Thus, 362 patients were selected as subjects for our study. The study inclusion and exclusion processes are shown in **Figure 1**.

Procedures

We gathered data by retrospectively accessing electronic medical records. A structured data accessing, and coding protocol was used to ensure consistency in the order and method of data extraction. We employed each patient's summary at the time of discharge (if these contained insufficient information, we went back to summaries that had been written before those to confirm the information), and gathered demographic data, clinical data, data on the history of self-harm and other damaging behavior, and review by a multidisciplinary team.

Outcomes and Measures

Discharge to community settings, such as home or other facilities, were defined as the outcome of this study. We excluded discharge due to transfer to other hospitals and death, because they could occur even under conditions where the adjustment of symptoms and the living environment had not been carried out sufficiently. Observations ended on January 14, 2020, and patients who stayed beyond this endpoint were categorized as censored subjects.

We investigated the effect of variables that have been reported to be associated with hospitalization in previous studies. Demographic data included age, sex, educational background (compulsory education, i.e., educated or not beyond Japan's legal requirement of middle school), lifetime marital history (presence/absence), and lifetime employment history (judged "Yes" if the subject worked full-time, or part-time, or even worked for a brief period) were collected.

Clinical data included the length of hospital stay, discharge destination, primary psychiatric diagnosis according to Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems, the presence/absence of substance use disorder (treatment history for one or more of the following: alcohol, stimulants, marijuana, cocaine, organic solvents, designer drugs, and/or abuse of prescription drugs), intravenous sedation given/not given on admission, and implementation of electroconvulsive therapy (ECT) during hospitalization.

We reviewed the entire disease history in the summary. The reason for admission was noted in the disease history. If there was violent behavior coded on the Modified Overt Aggression Scale, we judged that "Violent behavior that led to the current admission" is present. Next, we categorized these as verbal violence, violence toward property and objects, self-harm, and physical violence. It is important to note that this includes not only physical but also verbal violence, violence toward property, and self-harm.

Data from the review by a multidisciplinary team were collected from the patients' electronic medical records. The review aimed to promote discharge by discussing the need for psychiatric hospitalization as well as measures and programs toward discharge and clarifying the planned period of hospital stay. Regarding the subjects' needs with respect to discharge, Tokyo Metropolitan Matsuzawa Hospital stipulates choosing multiple relevant items from the following: "Improvement of symptoms (presence of any unstable mental status that inhibits discharge)," "Insight of disease (patients' awareness of symptoms and treatment needs)," "Living skills (adequate daily living skills such as cooking, washing, and eating for life in community)," "Coping with symptoms (self-care ability to prevent relapse)," and "Preparation for living (housing, finances, food, and other life preparations)." The presence or absence of each of these items was collected as a binary variable. "Willingness to be discharged after the assessment" was a free description of the subject's hopes and wishes to be discharged. The presence or absence of requests to be discharged was also collected as a binary variable.

At the assessment, the multidisciplinary team reset the planned length of stay, but if the patient continued admission beyond that period, a review was held more than once during a single hospital stay. To prioritize early-stage assessments during hospitalization, we referred to the records of deliberations held for the first time.

Statistical Analysis

First, we divided the subjects into two groups according to whether violent behavior had or had not led to the current admission (the Violent group and Non-violent group, respectively). We compared variables between groups using bivariate analysis. Chi-square tests were used to analyze between-group differences in sex, educational history, marital history, working history, substance abuse problems, intravenous sedation, ECT, and assessment of needs in prolonged-stay patients. Mann-Whitney U tests were used for between-group comparisons in age and length of stay.

Second, to investigate the influence of predictive factors for the length of hospitalization, we conducted survival analysis. The

number of hospital days did not follow a normal distribution (mean = 301.5, standard deviation = 218.5, Shapiro-Wilk W = 0. 78, $P < 0.001$), even after a logarithmic transformation (mean = 2.4, standard deviation = 0.3, Shapiro-Wilk W = 0. 98, $P < 0.001$). All the explanation variables other than age were qualitative. We therefore established the occurrence of discharge to a community setting as the outcome, and used the Cox proportional hazard model to analyze the influence of multiple explanatory variables by taking the passage of time (length of stay) into consideration.

We performed Cox univariate analysis for each variable separately and investigated the relationships between the occurrence of discharge to the community and the latent predictive factors. Next, Cox multivariate analysis was used to assess the influence of independent variables on the discharge to community. We used age, sex, and variables that were significant at the $P < 0.05$ level in our univariate regression (diagnosis of schizophrenia, schizotypal and delusional disorders; implementation of ECT during admission; needs for improvement of symptoms; needs for insight of disease; needs for living skills; needs for coping skills with symptoms; and violent behavior that had led to admission), and included them as independent variables, using the forced entry method.

We used the correlation matrix table for all the variables to confirm that there were no combinations of variables that showed high correlation coefficients (above 0.9) to assess multi-collinearity of the variables to be entered into the multivariate analysis. We also observed a log-log graph of qualitative variables that were finally entered into the model and confirmed that proportional hazard assumptions had been maintained. IBM SPSS Statistics for Mac, version 23.0 (SPSS Inc., Chicago, IL, USA) was employed for all statistical analyses. The level of significance was set as $\alpha = 0.05$.

Ethical Considerations

This study was conducted in accordance with the recommendations of the Ethical Guidelines for Medical and Health Research Involving Human Subjects of the Japanese Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Health, Labor, and Welfare. The need for informed consent was waived since this was a retrospective study. The research protocol was approved by the Tokyo Metropolitan Matsuzawa Hospital Ethics Committee (No. 26, FY2017) in accordance with the Declaration of Helsinki.

RESULTS

Table 1 summarizes the characteristics of the study subjects. Of the 362 subjects, 94 (26%) had violent behavior preceding hospitalization. The breakdown, based on multiple choice

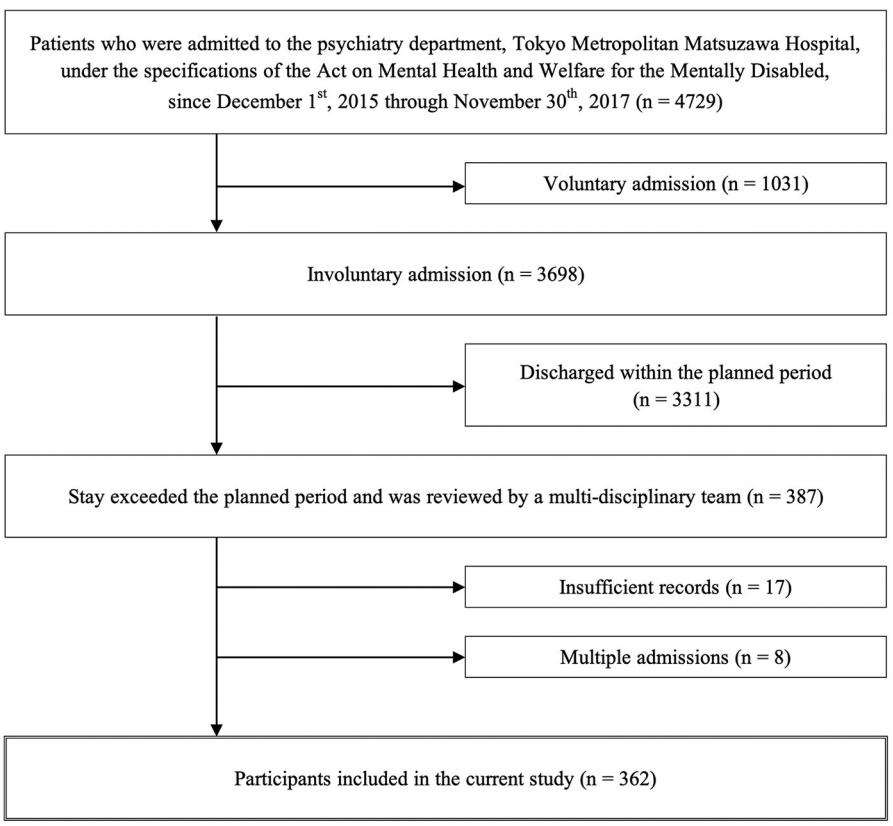

FIGURE 1 | Patient flowchart describing the inclusion and exclusion criteria to identify target cases for the study.

TABLE 1 | Characteristics of the participants according to the presentation of violent behavior that led to the current admission.

Variables	Total ($n = 362$)	Violent ($n = 94$)	Non-Violent ($n = 268$)	P^*
Demographic data				
Mean age, yr (SD)	49 (16)	47 (17)	50 (16)	0.12
Male, *n* (%)	206 (57)	60 (64)	146 (55)	0.12
Less than high school diploma, *n* (%)	120 (33)	28 (30)	92 (34)	0.42
Lifetime marital history, *n* (%)	98 (27)	25 (27)	73 (27)	0.90
Lifetime working activity, *n* (%)	269 (74)	68 (72)	201 (75)	0.61
Substance abuse problem, *n* (%)	53 (15)	8 (9)	45 (17)	0.051
Discharge destination				
Discharged to community, *n* (%)	299 (83)	86 (91)	213 (80)	
Transferred to other hospital, *n* (%)	43 (12)	8 (9)	35 (13)	
Discharge due to death, *n* (%)	5 (1)	0 (0)	5 (1)	
Censored, *n* (%)	15 (4)	0 (0)	15 (4)	
Length of stay				
Median, days (25, 75%)	235 (158,356)	195 (157,290)	242 (159,378)	0.032
Clinical characteristics				
Primary diagnosis				
Schizophrenia, schizotypal, and delusional disorders, *n* (%)	266 (74)	67 (71)	199 (74)	
Mood disorders, *n* (%)	19 (5)	5 (5)	14 (5)	
Personality disorders, *n* (%)	12 (3)	2 (2)	10 (4)	
Intellectual disability, *n* (%)	29 (8)	12 (13)	17 (6)	
Other disorders, *n* (%)	36 (10)	8 (9)	28 (11)	
Intravenous sedation prior to admission, *n* (%)	205 (57)	60 (64)	145 (54)	0.10
Electroconvulsive therapy, *n* (%)	75 (21)	19 (20)	56 (21)	0.89
Review by a multidisciplinary team				
Needs for improvement of symptoms, *n* (%)	135 (37)	27 (29)	108 (40)	0.046
Needs for insight of disease, *n* (%)	139 (38)	28 (30)	111 (41)	0.046
Needs for living skills, *n* (%)	132 (37)	26 (28)	106 (40)	0.039
Needs for coping skills with symptoms, *n* (%)	170 (47)	39 (42)	131 (49)	0.22
Needs for preparation for living, *n* (%)	282 (78)	73 (78)	209 (78)	0.95
Willingness to be discharged after the assessment, *n* (%)	255 (70)	75 (80)	180 (67)	0.021

**Chi-square tests were used for between-group comparisons in sex, educational history, marital history, working history, substance abuse problem, intravenous sedation, electroconvulsive therapy, and the assessment of needs in prolonged-stay patients; Mann-Whitney U-tests were used for between-group comparisons in age and length of stay.*

answers, was verbal violence for 28 subjects, violence toward property and objects for 28, self-harm for 22, and physical violence for 23. No significant differences were observed between the two groups in terms of demographic data, i.e., age, sex, educational background, career history, marital history, or history of substance abuse.

During the observation period, 299 subjects were discharged to the community, while 43 subjects remained in the hospital to which they had been transferred. There were also some subjects who died or continued their stay at Matsuzawa Hospital without being discharged and were censored.

The median length of stay in the Violent group was significantly shorter than the one observed in the Non-Violent group. The distribution of hospitalization days in the Violent and Non-violent groups was similar in the first quartile in both groups, but the median and third quartiles were larger in the Non-violent group. In other words, the distribution of hospitalization days in each group reflects a clear difference.

The most frequent diagnoses were those of schizophrenia and schizotypal and delusional disorders, accounting for 74% of the cases. Diagnoses of diseases other than schizophrenia were relatively rare.

There was no significant difference in occurrence between the two groups for subjects who received intravenous sedation on admission or ECT during hospitalization.

In terms of a review by a multidisciplinary team, "preparation for living" was selected as the item which most needed this.

The items assessed as being significantly more frequent in the Non-violent group were "Improvement of symptoms," "Insight of the disease," and "Living skills." The "Willingness to be discharged after the assessment" was significantly more frequent in the Violent group.

Table 2 represents the results of the Cox univariate analysis, wherein a hazard ratio of greater than unity (one) suggests a higher likelihood of discharge, i.e., a shorter hospital stay. Diagnosis of schizophrenia and schizotypal and delusional

TABLE 2 | Cox proportional univariate hazard ratios.

Variables	Hazard ratio* (95% CI)	*P*
Age	0.994 (0.987: 1.002)	0.14
Male	0.883 (0.702: 1.112)	0.29
Less than high school diploma	0.899 (0.706: 1.145)	0.39
Lifetime marital history	1.248 (0.960: 1.623)	0.098
Lifetime working activity	0.794 (0.612: 1.030)	0.082
Substance abuse problem	1.136 (0.822: 1.571)	0.44
Schizophrenia, schizotypal, and delusional disorders	0.764 (0.588: 0.992)	0.044
Mood disorders	1.601 (0.978: 2.622)	0.061
Personality disorders	1.499 (0.796: 2.823)	0.21
Intellectual disability	1.282 (0.850: 1.933)	0.24
Intravenous sedation prior to admission	0.974 (0.774: 1.225)	0.82
Electroconvulsive therapy	0.725 (0.543: 0.969)	0.030
Needs for improvement of symptoms	0.710 (0.559: 0.901)	<0.010
Needs for insight of disease	0.693 (0.546: 0.880)	<0.010
Needs for living skills	0.658 (0.517: 0.839)	<0.010
Needs for coping skills with symptoms	0.769 (0.612: 0.967)	0.025
Needs for preparation for living	0.844 (0.644: 1.108)	0.22
Willingness to be discharged after assessment	1.267 (0.978: 1.642)	0.073
Violent behavior that led to the current admission	1.535 (1.189: 1.981)	<0.010

**Hazard ratios of > 1 indicate increases in the probability of discharge.*

TABLE 3 | Cox proportional multivariate hazard ratios.

Variables	Hazard ratio* (95% CI)	*P*
Age	0.995 (0.987: 1.002)	0.16
Male	0.987 (0.767: 1.251)	0.92
Schizophrenia, schizotypal, and delusional disorders	0.828 (0.628: 1.092)	0.18
Electroconvulsive therapy	0.809 (0.592: 1.105)	0.18
Needs for improvement of symptoms	0.808 (0.622: 1.050)	0.11
Needs for insight of disease	0.873 (0.637: 1.197)	0.40
Needs for living skills	0.755 (0.570: 0.999)	0.050
Needs for coping skills with symptoms	1.076 (0.803: 1.442)	0.62
Violent behavior that led to the current admission	1.428 (1.101: 1.854)	<0.010

**Hazard ratios of > 1 indicate increases in the probability of discharge.*

disorder; implementation of ECT during admission; the needs for improvement of symptoms; the needs for insight of disease; the needs for living skills; and the needs for coping skills with symptoms were all associated with a significantly lower likelihood of discharge, whereas violent behavior that led to the current admission was associated with a significantly higher likelihood of discharge. We decided to enter these variables into the final model.

Table 3 represents the results of the proportional hazard analysis via the forced entry method. The results of the model Chi-square test revealed a significance level of $P < 0.01$. Violent behavior that led to current admission was associated with a significantly higher likelihood of discharge. The variable "Needs for living skills" was close to reaching a significant association with a lower likelihood of discharge.

DISCUSSION

In contrast to our hypothesis, in the subjects of our study, violent behavior prior to admission was associated with a significantly higher likelihood of discharge. In other words, it did not contribute significantly to prolonged hospitalization in patients who deviated from the treatment plan and had exceeded the planned hospitalization duration. The univariate analysis revealed that "Improvement of symptoms," "Insight of the disease," and "Living skills" were found to be significantly more frequent in the Non-violent group. The violent group more frequently expressed a wish to be discharged. The distribution of hospitalization days in the Violent and Non-violent groups was similar in the first quartile of both groups, but the distribution was larger in the median and third quartiles of the Non-violent group. The Cox proportional hazard model demonstrated an association between the violent behavior that led to the current admission and a significantly higher likelihood of discharge. The association between the "Needs for living skills" and the duration of hospital stay was close to reaching significance; other factors identified by previous studies (such as age, sex, educational background, career history, marital history, diagnosis) were not significantly associated with stay duration.

Participants in the current study were long-stay patients who had exceeded the planned hospitalization duration. The length of stay in European and American countries is relatively short, and many previous studies that have investigated the association between violence and length of stay have mainly focused on acute care settings. Greenfield et al. observed a mean duration of 14.9 days in university-based, short-term inpatient psychiatric units (16). Di Lorenzo et al. found a mean duration of 10.38 days in a public psychiatric ward (23). Comparing patients in the psychiatric inpatient units of a large urban county hospital with over 60 days of hospitalization to those with <30, Cheng et al. observed that factors associated with extended length of stay included older age, cognitive impairment, higher number of medical conditions requiring medication, and violence during hospital stay (9). However, a relative paucity of knowledge about patients with hospitalizations of longer than several months remains. Our results may help to address the gap in the literature by documenting how violence relates to community transitions in the population with long hospital stays. Moreover, we only targeted involuntarily admitted patients who stayed longer than planned, and underwent review by a multidisciplinary team to exclude the patients who were discharged either based on their own will or in compliance with a pre-established protocol, regardless of their conditions. In this way, we could isolate the influence of various factors characteristic of the patients themselves on their lengths of hospital stays.

The results of the univariate analysis between the Violent and Non-Violent groups may partially explain the characteristics of patients who deviated from the treatment plan and had exceeded the planned hospitalization duration for whom hospital treatment had been initiated after incidents of violence; despite violent tendencies, these patients tend to have relatively mild symptoms, appropriate life skills, and may be able to show insight and express a wish to be discharged. They may be able to be discharged relatively early as long as their violent tendencies and impulsiveness improve during acute treatment. However, this result does not completely rule out the observer bias that that violence may result in lower estimates of needed support. This finding overlaps with those of Wolff et al., who noted that risks posed to other people tend to result in shorter hospitalization, and stabilization of acute crises during the first days of stay might prompt early discharge (13). Most previous studies have examined violence during hospitalization, but this study only examined violence prior to hospitalization. As violence is recognized relatively easily and is liable to be mentioned as a problem by the people surrounding the individual in question, it can trigger admission. Our findings recommend caution in using violence and impulsiveness observed during the acute stage to predict the difficulty of long-term treatment.

The distribution of hospitalization days in the Violent/Non-violent groups indicate a clear difference. It may explain that the impact of other factors other than violence progressively exceed that of violence as the length of hospital stay increases. In a study that divided hospital stay into durations of less or more than 36 days, Di Lorenzo et al. hypothesized that aggressiveness itself could justify the difficulty in discharging patients, especially when it contributes to a vicious cycle of aggressive escalation (23). However, our study provides new findings that the effects of aggressiveness may not last past several months. Although our study could not verify this implication, further study of relatively short stay patients may be warranted to explore how the heterogeneous effects of violence vary with the length of hospital stay.

The association between "Needs for living skills" and the length of hospital stay was close to reaching significance in the multivariate analysis. The factor of living skill may become more significant as the length of hospitalization increases. This finding is particularly important for promoting discharge support to community settings in Japan, where prolonged hospital stays beyond a few months are problematic. In our study, violent tendency was not associated with further prolonged length of stay. It may explain that the prolonged hospitalization in Japan does not necessarily imply intention to isolate the patients from a security point of view. The OECD reported that Japanese hospital beds contain many beds for long-term inpatients that are not classified as psychiatric wards in European and American countries (1); our results may be related to this peculiarity of Japan. Okayama et al. also point out that beds which should be classified as community beds are still classified as "long-stay beds" of hospitals, due to the lack of public funding for private hospitals (24). There may be a rather large problem associated with institutional issues that are hindering patient transition back into the community. As Zhang et al. point out (25), this may indicate the need for the government to take initiatives to remove economic and social obstacles to the development of community support services.

The factors identified by previous studies, such as age, sex, educational background, career history, marital history, and diagnosis, were not presently found to be significantly associated with stay duration. However, it is necessary to consider that our survey did not target patients for whom treatment had proceeded smoothly; we only targeted long-stay patients whose symptoms complicated the management of treatment, whose discharge dates were consequently adjusted, and were required to undergo review by a multidisciplinary team. The demographic profile of each patient's background information, such as age, sex, and diagnosis, may not associate with the length of hospital stays in a population longer than several months.

Limitations

The present study was subject to several limitations. First, although we have referred to the results of review by a multidisciplinary team by certified professionals, such as physicians, nurses, and social workers, we did not use a standardized assessment scale. This may have created an inter-reviewer bias. A standard assessment scale should therefore be used in future studies. For example, following previous studies, we would be able to use the Positive and Negative Syndrome Scale (PANSS) to assess symptoms, Social Behavior Scale (SBS) to assess social behavior, and Global Assessment of Functioning (GAF) for comprehensive assessment. Second, our survey was performed at a single institution. To verify whether our findings could be applied to other general clinical situations, a survey that expands the forum of research to other institutions is warranted. In addition, the length of hospitalization in Japan is much longer than that in European and American countries, and the legal system is also different. It should be noted that this is an exploratory study and may not be immediately generalizable to psychiatric wards in European and American countries. Third, this study did not target patients who had been discharged according to the initial plan, compromising the generalizability of our findings to participants who were discharged after a relatively short period. We may assess how each factor affects hospitalization in greater detail by expanding the range of selected subjects to patients who underwent treatment as planned and received no reviews by a multidisciplinary team and comparing those results to those presently reported. In addition, it may enable us to confirm in greater detail that the heterogeneous effects of violence vary with the length of hospital stay, as suggested in this study.

CONCLUSION

Violent behavior prior to admission did not influence prolonged hospitalization among patients who deviated from the treatment plan and had exceeded the planned hospitalization duration. We recommend caution in using violence and impulsiveness observed during the acute stage to predict the difficulty of long-term treatment. The impact of factors such as living skills may

become progressively greater than that of violence as the length of hospital stay increases. Further research that considers relatively patients of relatively shorter hospital stays may be needed to explore the heterogeneous effects of violence, as such effects may vary according to the length of patient's stay.

DATA AVAILABILITY STATEMENT

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The Tokyo Metropolitan Matsuzawa Hospital Ethics Committee (No. 26, FY2017). Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

HK designed the study, collected the data, undertook the statistical analysis, and interpreted the data. TO and NK designed the study and critically revised the first draft. HK wrote the first draft of the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

This study was funded by the Ministry of Health, Labor, and Welfare. The sponsors had no role in the study design, data collection and analysis, decision to publish, or in the preparation of the manuscript.

ACKNOWLEDGMENTS

The authors would like to thank Atsushi Imai, Toshiaki Kono, and Koji Takeda for their helpful advice in drafting the manuscript.

REFERENCES

1. Organization of Economics Development. *Japan Trails Other Countries in "deinstitutionalization", but There are Signs of Progress, Says OECD*. Available online at: https://www.oecd.org/els/health-systems/MMHC-Country-Press-Note-Japan.pdf (accessed July 4, 2020).
2. Mattes J A. The optimal length of hospitalization for psychiatric patients: a review of the literature. *Hosp Community Psychiatry.* (1982) 33:824–8. doi: 10.1176/ps.33.10.824
3. Knapp M, Chisholm D, Astin J, Lelliott P, Audini B. The cost consequences of changing the hospital-community balance: the mental health residential care study. *Psychol Med.* (1997) 27:681–92. doi: 10.1017/S0033291796004667
4. Sood S, Baker M, Bledin K. Social and living skills of new long-stay hospital patients and new long-term community patients. *Psychiatr Serv.* (1996) 47:619–22. doi: 10.1176/ps.47.6.619
5. Babalola O, Gormez V, Alwan NA, Johnstone P, Sampson S. Length of hospitalisation for people with severe mental illness. *Cochrane Database Syst Rev.* (2014) 1:CD000384. doi: 10.1002/14651858.CD000384.pub3
6. Okumura Y, Sugiyama N, Noda T, Tachimori H. Psychiatric admissions and length of stay during fiscal years 2014 and 2015 in Japan: a retrospective cohort study using a nationwide claims database. *J Epidemiol.* (2019) 29:288–94. doi: 10.2188/jea.JE20180096
7. Newman L, Harris V, Evans LJ, Beck A. Factors associated with length of stay in psychiatric inpatient services in London, UK. *Psychiatr Q.* (2018) 89:33–43. doi: 10.1007/s11126-017-9498-7
8. Tulloch AD, Fearon P, David AS. Length of stay of general psychiatric inpatients in the United States: systematic review. *Adm Policy Ment Health.* (2011) 38:155–68. doi: 10.1007/s10488-010-0310-3
9. Cheng JE, Shumway M, Leary M, Mangurian CV. Patient factors associated with extended length of stay in the psychiatric inpatient units of a large urban county hospital. *Community Ment Health J.* (2016) 52:658–61. doi: 10.1007/s10597-015-9912-2
10. Habermeyer B, De Gennaro H, Frizi RC, Roser P, Stulz N. Factors associated with length of stay in a swiss mental hospital. *Psychiatr Q.* (2018) 89:667–74. doi: 10.1007/s11126-018-9569-4
11. Jacobs R, Gutacker N, Mason A, Goddard M, Gravelle H, Kendrick T, et al. Determinants of hospital length of stay for people with serious mental illness in england and implications for payment systems: a regression analysis. *BMC Health Serv Res.* (2015) 15:439. doi: 10.1186/s12913-015-1107-6
12. Huntley D A, Cho D W, Christman J, Csernansky J G. Predicting length of stay in an acute psychiatric hospital. *Psychiatr Serv.* (1998) 49:1049–53. doi: 10.1176/ps.49.8.1049
13. Wolff J, McCrone P, Patel A, Kaier K, Normann C. Predictors of length of stay in psychiatry: analyses of electronic medical records. *BMC Psychiatry.* (2015) 10:e0121910. doi: 10.1186/s12888-015-0623-6
14. Gopalakrishna G, Ithman M, Malwitz K. Predictors of length of stay in a psychiatric hospital. *Int J Psychiatry Clin Pract.* (2015) 19:238–44. doi: 10.3109/13651501.2015.1062522
15. Tulloch AD, Fearon P, David AS. The determinants and outcomes of long-stay psychiatric admissions: a case-control study. *Soc Psychiatry Psychiatr Epidemiol.* (2008) 43:569–74. doi: 10.1007/s00127-008-0332-2
16. Greenfield T K, McNiel D E, Binder R L. Violent behavior and length of psychiatric hospitalization. *Hosp Community Psychiatry.* (1989) 40:809–14. doi: 10.1176/ps.40.8.809
17. Baeza FL, da Rocha NS, Fleck MP. Predictors of length of stay in an acute psychiatric inpatient facility in a general hospital: a prospective study. *Braz J Psychiatry.* (2018) 40:89–96. doi: 10.1590/1516-4446-2016-2155
18. Zhang J, Harvey C, Andrew C. Factors associated with length of stay and the risk of readmission in an acute psychiatric inpatient facility: a retrospective study. *Aust N Z J Psychiatry.* (2011) 45:578–85. doi: 10.3109/00048674.2011.585452
19. Broderick C, Azizian A, Warburton K. Length of stay for inpatient incompetent to stand trial patients: importance of clinical and demographic variables. *CNS Spectr.* (2020) 25:734–42. doi: 10.1017/S1092852920001273
20. *Tokyo Metropolitan Matsuzawa Hospital. Outpatients by Department* (in Japanese). Available online at: https://www.byouin.metro.tokyo.lg.jp/matsuzawa/aboutus/kanja_toukei/shinryouka_gairaisuu.html (accessed July 4, 2020).
21. *Tokyo Metropolitan Matsuzawa Hospital. Inpatients by Department* (in Japanese). Available online at: https://www.byouin.metro.tokyo.lg.jp/matsuzawa/aboutus/kanja_toukei/shinryouka_nyuuinsuu.html (accessed July 4, 2020).
22. *Act on Mental Health and Welfare for the Mentally Disabled* (in Japanese). Available online at: https://elaws.e-gov.go.jp/document?lawid=325AC1000000123_20200401_430AC0000000079 (accessed May 15, 2021).

23. Di Lorenzo R, Montardi G, Panza L, Del Giovane C, Saraceni S, Rovesti S, et al. Retrospective analysis of factors associated with long-stay hospitalizations in an acute psychiatric ward. *Risk Manag Health Policy*. (2020) 13:433–42. doi: 10.2147/RMHP.S238741
24. Okayama T, Usuda K, Okazaki E, Yamanouchi Y. Number of long-term inpatients in Japanese psychiatric care beds: trend analysis from the patient survey and the 630 survey. *BMC Psychiatry*. (2020) 20:522. doi: 10.21203/rs.3.rs-15837/v1
25. Zhang S, Mellsop G, Brink J, Wang X. Involuntary admission and treatment of patients with mental disorder. *Neurosci Bull*. (2015) 31:99–112. doi: 10.1007/s12264-014-1493-5

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 09 July 2021
doi: 10.3389/fpsyt.2021.656646

Associations Between Child Maltreatment and Depressive Symptoms Among Chinese College Students: An Analysis of Sex Differences

Xiaoliang Chen[1,2], *Sheng Zhang*[1,2], *Guoliang Huang*[3], *Yan Xu*[3], *Qian Li*[1,2], *Jingman Shi*[1,2], *Wenyan Li*[1,2], *Wanxin Wang*[1,2], *Lan Guo*[1,2*] *and Ciyong Lu*[1,2*]

[1] *Department of Medical Statistics and Epidemiology, School of Public Health, Sun Yat-sen University, Guangzhou, China,* [2] *Guangdong Engineering Technology Research Center of Nutrition Translation, Guangzhou, China,* [3] *Center for ADR (Adverse Drug Reaction) Monitoring of Guangdong, Guangzhou, China*

OPEN ACCESS

Edited by:
Jutta Lindert, University of Applied Sciences Emden Leer, Germany

Reviewed by:
Seth Davin Norrholm, Wayne State University, United States
Andreas Jud, University of Ulm, Germany

***Correspondence:**
Lan Guo
guolan3@mail.sysu.edu.cn
Ciyong Lu
luciyong@mail.sysu.edu.cn

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *21 January 2021*
Accepted: *28 May 2021*
Published: *09 July 2021*

Citation:
Chen X, Zhang S, Huang G, Xu Y, Li Q, Shi J, Li W, Wang W, Guo L and Lu C (2021) Associations Between Child Maltreatment and Depressive Symptoms Among Chinese College Students: An Analysis of Sex Differences. Front. Psychiatry 12:656646. doi: 10.3389/fpsyt.2021.656646

Background: Depressive symptoms and child maltreatment are both global public health problems among young adults. This study aimed to investigate the associations between five types of child maltreatment and depressive symptoms among Chinese college students, with a focus on potential sex differences.

Methods: A cross-sectional study of a nationally representative sample of Chinese college students was conducted from March to June 2019 with a multistage, stratified cluster, random sampling method. In total, 30,179 college students from 60 colleges of 10 Chinese province-level regions completed standard questionnaires, including a history of child maltreatment and current depressive symptoms.

Results: The prevalence of depressive symptoms among college students in China was 7.3%. After adjusting for control variables, physical abuse (adjusted odds ratio [aOR] = 1.20, 95% confidence interval [CI] = 1.17–1.23), emotional abuse (aOR = 1.21, 95% CI = 1.19–1.23), sexual abuse (aOR = 1.19, 95% CI = 1.16–1.22), physical neglect (aOR = 1.14, 95% CI = 1.12–1.16) and emotional neglect (aOR = 1.08, 95% CI = 1.07–1.09) were all positively associated with depressive symptoms. Notably, a cumulative effect of child maltreatment on depressive symptoms among Chinese college students was observed. Moreover, sex differences in the associations of emotional abuse, emotional neglect, and the number of maltreatment types with depressive symptoms were statistically significant ($P < 0.05$). Further stratification analyses showed that female students who experienced emotional abuse and emotional neglect had a higher risk of depressive symptoms than male students, and the cumulative effect of maltreatment types was stronger for females than males.

Conclusion: Five types of child maltreatment and their co-occurrence were associated with an increased risk of depressive symptoms among college students. Furthermore, the effects of emotional abuse, emotional neglect and the number of maltreatment types on depressive symptoms were stronger for females than for males. These findings can

promote understanding of the effects of child maltreatment on depressive symptoms, and prevention and intervention strategies for depressive symptoms should consider the type of child maltreatment and sex differences.

Keywords: child maltreatment, depressive symptoms, college students, cumulative effect, sex

INTRODUCTION

Depressive symptoms are a common mental health problem worldwide and are a leading contributor to the global burden of disease in young people (1). According to national surveys in the U.S., the prevalence of depressive symptoms in college students has risen in recent years (2, 3). In the transition from adolescence to adulthood, college students are vulnerable to developing depression in the context of managing enormous pressures from academic demands, interpersonal relationships, finances, and employment (4). Depressive symptoms are one of the most prevalent mental disorders among college students (5, 6). A meta-analysis including 37 studies from different countries reported an overall prevalence of depressive symptoms (24.4%) among college students (7), which was substantially higher than that of the general population. Moreover, the prevalence of depressive symptoms among Chinese college students was estimated to be 11.7% (8). Depressive symptoms at an early age could result in a series of mental health disorders later in life and physical health diseases (9), unemployment, and suicidal behavior (10, 11). Although the etiology of depression is complex and multifactorial, the vital influence of child maltreatment on depression has been generally recognized (12).

Child maltreatment is a widespread, global problem affecting millions of children worldwide (13). It takes different forms: physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect. Under the influence of Confucianism, Chinese traditional culture emphasizes children's obedience to parental authority (14). In China, child maltreatment is common (15). Child maltreatment not only adversely affects people's social functioning, mental health, and physical health in the short and long term (16) but also leads to a heavy economic burden (15). Previous studies have reported positive associations between various types of child maltreatment and depressive symptoms (17–19). Most of these studies were conducted in Western or developed countries. For example, Canadian research indicated that a history of child physical and sexual abuse was associated with depression (20). Different types of maltreatment often co-occur (21). Exposure to multiple types of maltreatment may further elevate the risk of adverse psychological outcomes, including depressive disorders, anxiety disorders and posttraumatic stress disorders, in early adulthood, leading to cumulative damage to victims' mental health (22).

Women are approximately twice as likely to develop depression as men (23). Men and women have different prevalence rates of experiences of different types of child maltreatment, such as sexual abuse and verbal abuse (a form of emotional abuse) (13, 24). It is not clear whether the effects of child maltreatment on depressive symptoms differ by sex. Only a few studies in Western countries have investigated whether sex moderates the effects of child maltreatment on depressive symptoms, but their findings are inconsistent. Youssef et al. reported that females with a history of emotional neglect were significantly more susceptible to depressive symptoms than males (25). Roxburgh and MacArthur observed that men who reported having experienced sexual assault were more depressed than women (26). However, a study found no sex differences in the associations between all types of child maltreatment and depression in adulthood (27).

To our knowledge, there is a dearth of studies investigating the associations between single and multiple types of child maltreatment and depressive symptoms in college students, and no study in China has assessed the potential moderating effects of sex on these associations among college students. Therefore, we conducted this national cross-sectional study among Chinese college students to explore the single and multiple effects of five types of child maltreatment on depressive symptoms, as well as the moderating role of sex on these effects.

METHODS

Study Design and Participants

Data were drawn from a school-based, cross-sectional study of a nationally representative sample of Chinese college students from March to June 2019, with a multistage, stratified cluster, random sampling method. In stage 1, we stratified the province-level regions of China into three categories based on per capita gross domestic product and then randomly selected 10 for inclusion in the study: Guangdong, Shandong, Hunan, Henan, Inner Mongolia, Heilongjiang, Yunnan, Guizhou, Xinjiang and Chongqing. In stage 2, colleges in the chosen regions were divided into undergraduate universities and vocational and technical colleges, and then three colleges were randomly selected in each stratum. A total of 60 colleges were included. In stage 3, a total of 4 majors (for 4-year or more programs) or 6 majors (for 3-year programs) were randomly selected from each college, and 1 class was randomly selected from each year of each major (because senior students participate in internships outside the college, we selected only students in years 1–3 for 4-year or more majors and students in years 1–2 for 3-year majors). In the selected classes, all available students were invited to participate in the research. Finally, 30,179 qualified questionnaires were completed, with a response rate of 97.2%. With the help of trained interviewers, one class period was scheduled for students to complete anonymous self-report questionnaires in classrooms without teachers present to reduce potential information bias.

Measures

Depressive Symptoms

The Center for Epidemiologic Studies Depression Scale (CES-D) was used to measure depressive symptoms; the Chinese version has been used and validated among Chinese college students (28). In the present study, the Cronbach's alpha for the CES-D scale was 0.87. This scale contains 20 items, and each item has four response options, ranging from "rarely or none of the time" to "most or all of the time." The CES-D has a score range of 0–60. A higher score represents more severe depressive symptoms. We used a CES-D score of ≥28 to identify students at risk for subthreshold depression, also calling having depressive symptoms (29). This cutoff score has been adopted in previous studies in China (30, 31).

Child Maltreatment

The Childhood Trauma Questionnaire-Short Form (CTQ-SF) (32) was used to assess a history of child maltreatment. The Chinese version of the CTQ-SF has demonstrated good reliability and validity in Chinese undergraduate students (33) and is extensively used in China (34). The CTQ-SF has 5 subscales covering 5 types of child maltreatment: physical abuse, sexual abuse, physical neglect, emotional neglect, and emotional abuse. Each subscale consists of 5 questions about experiences in childhood. The responses are rated on a 5-point scale ("never," "rarely," "sometimes," "often," and "very often"), and subscale scores range from 5 to 25. Higher subscale scores indicate more severe experiences of child maltreatment.

Additionally, the severity of each type of maltreatment was categorized as none, low, moderate, and severe (32, 35). For the present study, "moderate" to "severe" child maltreatment was defined as the presence of child maltreatment (36, 37). The cutoff scores were ≥10 for physical abuse, ≥8 for sexual abuse, ≥10 for physical neglect, ≥15 for emotional neglect, and ≥13 for emotional abuse. Each type of child maltreatment was coded as yes (1) or no (0), and then the dichotomized variables were summed to assess the number of maltreatment types experienced from 0 (experienced no maltreatment) to 5 (experienced each type of maltreatment) (36, 37).

Demographic Variables

Demographic variables, including age, sex ("male" = 1 and "female" = 2), year in college (from 1st to 3rd year), living arrangement, household socioeconomic status (HSS), academic pressure, relationships with classmates, relationships with teachers, current smoking and current alcohol use, were collected. Sex was assessed based on students' biological sex. Living arrangement was measured by asking students which individuals mainly lived in their primary home before they turned 16 ("living with both parents" = 1, "living with a single parent" = 2, and "living with others" = 3). HSS was assessed by students' perceived level of their family financial situation ("excellent or very good" = 1, "good" = 2, and "fair or poor" = 3). Academic pressure was estimated based on students' own perception of their academic stress ("above average" = 1, "average" = 2, and "below average" = 3). Relationships with classmates/teachers were evaluated by asking students' opinion of their relations with classmates/teachers ("good" = 1, "average" = 2, and "poor" = 3). Current smoking/alcohol use was defined as having smoked/drunk in the past 30 days ("no" = 0 and "yes" = 1).

Statistical Analysis

First, descriptive statistics were calculated and *t*-tests or chi-square tests were performed to describe the differences in depressive symptoms by demographic characteristics. Continuous data were reported as the means and standard deviations (SDs) and analyzed by *t*-tests; categorical data were reported as frequencies and percentages and analyzed by chi-square tests. The demographic variables that had $P < 0.10$ or have been widely reported in the literature (i.e., age, sex) were entered into the following multivariate logistic regression models as covariates. Covariates for adjustment included age, sex, living arrangement, household socioeconomic status, academic pressure, relationships with classmates, relationships with teachers, current smoking, and current alcohol use. Second, univariate and multivariate logistic regression models were performed to assess the associations between five types of child maltreatment and depressive symptoms, and the odds ratios (ORs) and 95% confidence intervals (95% CIs) were calculated. The associations between the number of maltreatment types experienced and depressive symptoms were also evaluated by univariate and multivariate logistic regression models. Third, to investigate whether sex moderated the association between child maltreatment and depressive symptoms, we examined multiplicative interactions by adding the product terms to the multivariate logistic regression and computing *P*-values for the interactions. If the interactions were significantly associated with depressive symptoms, further stratification analyses by sex were conducted to explore whether the effects of child maltreatment on depressive symptoms differed in males and females. Nagelkerke pseudo R^2 and omnibus test of model coefficients were employed to assess the overall fit of the models. All statistical analyses were conducted using SPSS version 25 (IBM, Armonk, New York, USA). All tests were two-tailed, with statistical significance set at $P < 0.05$.

RESULTS

Demographic Characteristics and Their Associations With Depressive Symptoms

The sample characteristics are presented in **Table 1**. Of the 30,179 students, 42.1% were male, and 57.9% were female. The participants' ages ranged from 15 to 24 years old, and the mean age was 19.9 (SD: 1.3) years. The mean CES-D score of students was 13.9 (SD: 8.6) points, and 2,193 students (7.3%) reported having depressive symptoms. The mean CTQ-SF scores for physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect were 5.5 (SD: 1.4), 6.3 (SD: 2.3), 5.3 (SD: 1.2), 6.9 (SD: 2.6), and 7.3 (SD: 4.4), respectively. The proportions of students who reported that they had suffered "moderate" to "severe" physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect were 2.4, 2.7, 3.0, 14.9, and 7.5%, respectively. Moreover, the groups with and without depressive

symptoms differed significantly in age, living arrangement, HSS, academic pressure, relationships with classmates, relationships with teachers, current smoking, and current alcohol use and each type of child maltreatment.

Associations Between Child Maltreatment and Depressive Symptoms

The univariable logistic regression models showed that all types of child maltreatment were positively associated with depressive symptoms ($P < 0.001$). In the multivariable logistic regression models with adjustment for control variables, physical abuse (score increase of 1; aOR = 1.20, 95% CI = 1.17–1.23), emotional abuse (score increase of 1; aOR = 1.21, 95% CI = 1.19–1.23), sexual abuse (score increase of 1; aOR = 1.19, 95% CI = 1.16–1.22), physical neglect (score increase of 1; aOR = 1.14, 95% CI = 1.12–1.16) and emotional neglect (score increase of 1; aOR = 1.08, 95% CI = 1.07–1.09) were associated with an increased risk of depressive symptoms. The Nagelkerke pseudo R^2 values indicated that the multivariable logistic regression models explained 14.8–18.6% of the variance in depressive symptoms (**Table 2**).

Concerning the cumulative effect of child maltreatment, multivariable logistic regression showed that experiences of 1, 2, 3, 4, and 5 types of maltreatment were significantly associated with depressive symptoms, with aORs (95% CIs) of 2.11 (1.87–2.39), 2.88 (2.47–3.35), 6.90 (5.27–9.03), 7.71 (5.40–11.03), and 10.52 (5.93–18.66), respectively (**Table 3**).

Interaction Effects Between Child Maltreatment and Sex on Depressive Symptoms

As shown in **Table 4**, adjusting for confounding variables, we found significant interaction effects of emotional abuse and emotional neglect with sex on depressive symptoms ($P < 0.01$). However, the adjusted interaction effects of physical abuse, sexual abuse, physical neglect with sex were not significant ($P > 0.05$). Furthermore, the effects of the number of maltreatment types experienced on depressive symptoms were significantly different between males and females ($P < 0.01$).

Associations Between Child Maltreatment and Depressive Symptoms, Stratified by Sex

The stratification analyses by sex are shown in **Table 5**. After we controlled for other variables, both emotional abuse (score increase of 1; aOR = 1.24, 95% CI = 1.21–1.26) and emotional neglect (score increase of 1; aOR = 1.09, 95% CI = 1.08–1.10) were positively associated with depressive symptoms among female students. Additionally, emotional abuse (score increase of 1; aOR = 1.18, 95% CI = 1.16–1.20) and emotional neglect (score increase of 1; aOR = 1.06, 95% CI = 1.05–1.08) were positively associated with depressive symptoms among male students. Female students exposed to emotional abuse and neglect had a higher risk of depressive symptoms than male students. Moreover, the association between the number of maltreatment types and depressive symptoms was significantly higher among females (number increase of 1; aOR = 1.83, 95% CI = 1.71–1.96) than males (number increase of 1; aOR = 1.64, 95% CI = 1.53–1.75).

DISCUSSION

We found that ∼7.3% of college students had depressive symptoms; this prevalence is lower than that in a Chinese study among undergraduate and postgraduate students, which reported a prevalence of depressive symptoms of 11.7% (8). The difference may be due to different study populations, measurement tools, and appraisal criteria.

Moreover, we observed that 11.5% of college students experienced a single type of child maltreatment, and 7.6% reported more than one type. Similar levels of multitype child maltreatment were found in a previous study (2015 School-Based Chinese Adolescents Health Survey) (38). The co-occurrence of different types of child maltreatment is relatively common in China. In addition, our results demonstrated the cumulative effects of child maltreatment on depressive symptoms among college students, with the aOR increasing from 2.11 to 2.88, 6.90, 7.71, and 10.52 as the number of maltreatment types increased from 1 to 2, 3, 4, and 5, respectively. This finding is consistent with previous studies reporting a dose-response relationship of cumulative child maltreatment with depressive symptoms (39, 40). Previous studies suggested that an increase in the number of maltreatment types experienced was linearly associated with an increased risk of depressive symptoms (41, 42). It's worth noting that students with three or more types of maltreatment had a markedly higher risk of depressive symptoms than those with one or two types in our study. Similarly, a study found that participants with four or more types of maltreatment had more serious depressive symptoms than those with three or fewer types (43). The relationship of cumulative child maltreatment to depressive symptoms may be more complex than a linear association. The results highlight the importance of considering multiple types of maltreatment in relation to depressive symptoms. Clinical practices and intervention strategies for depressive symptoms should screen and assess different types of child maltreatment (44), and college students with three or more types of child maltreatment may need more monitoring and targeted measures in China.

After adjusting for control variables, we found positive associations of physical abuse, emotional abuse, sexual abuse, physical neglect and emotional neglect with depressive symptoms among college students. This finding is consistent with previous studies (17–19, 45). For example, Yen et al. indicated that a history of child physical abuse was significantly associated with depression in adolescents (45). Child maltreatment is likely to increase individuals' susceptibility to developing depression in adulthood when they face stressful life events (46). One possible mechanism of this effect is that child maltreatment likely results in lasting alterations in the hypothalamic–pituitary–adrenal (HPA) axis, which is responsible for the stress response (47). Specifically, early stressors, such as child abuse, can aggravate the stress-induced glucocorticoid response and reduce

TABLE 1 | Demographic characteristics and their associations with depressive symptoms ($N = 30,179$).

Variable	Total	Depressive symptoms			
		No	Yes	χ^2/t	*P*-value[b]
	No. (%)	No. (%)	No. (%)		
Total	30,179	27,638 (92.7)	2,193 (7.3)		
Age (years)[a]	19.9 ± 1.3	19.9 ± 1.3	19.8 ± 1.4	2.228	0.026
Sex					
Male	12,688 (42.1)	11,750 (92.6)	938 (7.4)	0.079	0.778
Female	17,449 (57.9)	16,174 (92.7)	1,275 (7.3)		
Missing data	42				
Year in college					
1st	14,579 (48.3)	13,505 (92.6)	1,074 (7.4)	4.005	0.135
2nd	10,685 (35.4)	9,933 (93.0)	752 (7.0)		
3rd	4,915 (16.3)	4,525 (91.7)	390 (8.3)		
Living arrangement					
Living with both parents	17,515 (58.2)	16,423 (93.8)	1,092 (6.2)	80.147	<0.001
Living with a single parent	2,483 (8.2)	2,236 (90.1)	247 (9.9)		
Living with others	10,109 (33.6)	9,239 (91.4)	870 (8.6)		
Missing data	72				
Household socioeconomic status					
Excellent or very good	3,122 (10.5)	2,944 (94.3)	178 (5.7)	139.315	<0.001
Good	16,423 (55.1)	15,422 (93.9)	1,001 (6.1)		
Fair or poor	10,276 (34.4)	9,272 (90.2)	1,004 (9.8)		
Missing data	358				
Academic pressure					
Below average	8,864 (29.5)	8,514 (96.1)	350 (3.9)	898.880	<0.001
Average	12,807 (42.6)	12,169 (95.0)	638 (5.0)		
Above average	8,365 (27.9)	7,145 (85.4)	1,220 (14.6)		
Missing data	143				
Relationships with classmates					
Good	22,604 (75.0)	21,498 (95.1)	1,106 (4.9)	1146.307	<0.001
Average	7,281 (24.2)	6,284 (86.3)	997 (13.7)		
Poor	235 (0.8)	127 (54.0)	108 (46.0)		
Missing data	59				
Relationships with teachers					
Good	17,665 (58.7)	16,846 (95.4)	819 (4.6)	772.645	<0.001
Average	12,065 (40.1)	10,801 (89.5)	1,264 (10.5)		
Poor	358 (1.2)	232 (64.8)	126 (35.2)		
Missing data	91				
Current smoking					
No	25,282 (83.8)	23,573 (93.2)	1,709 (6.8)	77.864	<0.001
Yes	4,897 (16.2)	4,390 (89.6)	507 (10.4)		
Current alcohol use					
No	20,201 (66.9)	18,893 (93.5)	1,308 (6.5)	67.648	<0.001
Yes	9,978 (33.1)	9,070 (90.9)	908 (9.1)		
CTQ-SF scores for physical abuse[a]	5.5 ± 1.4	5.4 ± 1.3	6.2 ± 2.4	−24.873	<0.001
CTQ-SF scores for emotional abuse[a]	6.3 ± 2.3	6.2 ± 2.1	8.1 ± 3.7	−38.382	<0.001
CTQ-SF scores for sexual abuse[a]	5.3 ± 1.2	5.2 ± 1.0	5.7 ± 2.1	−20.082	<0.001
CTQ-SF scores for physical neglect[a]	6.9 ± 2.6	6.8 ± 2.5	8.2 ± 3.4	−24.068	<0.001
CTQ-SF scores for emotional neglect[a]	7.3 ± 4.4	7.2 ± 4.2	9.5 ± 5.6	−24.480	<0.001

[a] *Data are presented as the mean ± standard deviation.*
[b] *T-tests were used for continuous variables; chi-square tests were used for categorical variables.*
CTQ-SF, Childhood Trauma Questionnaire-Short Form.

TABLE 2 | Associations between child maltreatment and depressive symptoms.

Variables	Depressive symptoms			
	cOR (95% CI)	*P*-value	aOR (95% CI)[a]	*P*-value
Physical abuse (score increase of 1)	1.24 (1.22–1.27)	<0.001	1.20 (1.17–1.23)	<0.001
Emotional abuse (score increase of 1)	1.23 (1.21–1.25)	<0.001	1.21 (1.19–1.23)	<0.001
Sexual abuse (score increase of 1)	1.22 (1.19–1.25)	<0.001	1.19 (1.16–1.22)	<0.001
Physical neglect (score increase of 1)	1.17 (1.16–1.19)	<0.001	1.14 (1.12–1.16)	<0.001
Emotional neglect (score increase of 1)	1.09 (1.08–1.10)	<0.001	1.08 (1.07–1.09)	<0.001

[a]*Adjusted for age, sex, living arrangement, household socioeconomic status, academic pressure, relationships with classmates, relationships with teachers, current smoking, and current alcohol use. The Nagelkerke R^2 values ranged from 0.148 to 0.186.*
The omnibus tests of model coefficients were statistically significant in all the models ($P < 0.001$).
cOR, crude odds ratio; aOR, adjusted odds ratio; CI, confidence interval.

TABLE 3 | Crude and adjusted odds ratios and 95% confidence intervals for cumulative child maltreatment and depressive symptoms.

Number of maltreatment types experienced	Total (%)	cOR (95% CI)	*P*-value	aOR (95% CI)[a]	*P*-value
0	80.6	1		1	
1	11.5	2.50 (2.23–2.81)	<0.001	2.11 (1.87–2.39)	<0.001
2	6.0	3.41 (2.97–3.91)	<0.001	2.88 (2.47–3.35)	<0.001
3	1.1	8.69 (6.85–11.04)	<0.001	6.90 (5.27–9.03)	<0.001
4	0.6	8.71 (6.37–11.93)	<0.001	7.71 (5.40–11.03)	<0.001
5	0.2	11.17 (6.99–17.84)	<0.001	10.52 (5.93–18.66)	<0.001

[a]*Adjusted for age, sex, living arrangements, household socioeconomic status, academic pressure, relationships with classmates, relationships with teachers, current smoking status, and current alcohol use. The Nagelkerke R^2 value was 0.176.*
The omnibus test of model coefficients was statistically significant in the model ($P < 0.001$).
cOR, crude odds ratio; aOR, adjusted odds ratio; CI, confidence interval.

TABLE 4 | Interaction effects between child maltreatment and sex on depressive symptoms.

Interaction item	*P*-value
Physical abuse * sex	0.397
Emotional abuse * sex	<0.001
Sexual abuse * sex	0.117
Physical neglect * sex	0.088
Emotional neglect * sex	0.002
Number of maltreatment types experienced * sex	0.009

All the models were adjusted for age, sex, living arrangements, household socioeconomic status, academic pressure, relationships with classmates, relationships with teachers, current smoking status, and current alcohol use. The Nagelkerke R^2 values ranged from 0.148 to 0.187.
The omnibus tests of model coefficients were statistically significant in all the models ($P < 0.001$).

the expression of glucocorticoid receptors (48, 49). A growing body of clinical studies has linked child abuse to depression via changes in HPA axis function and behavior (50, 51). In addition, various biological alterations may be involved in this relationship, including neurotransmitter systems, inflammatory reactions, and brain regions relevant to mood regulation (52). Our results underscore the significant relationships between child maltreatment and depressive symptoms. However, compared with Western countries, the availability of child protectives services is still very limited in Chinese society. Effective preventive and intervention measures should be established as soon as possible in China, such as the training of professionals (53). As one of the most effective prevention approaches, the expressway noise barrier is a primary measure to reduce traffic noise. Chinese traditional Confucianism culture emphasizes children's obedience to parental authority (14), and strict parenting is common and socially accepted (54). More school-based or community-based lectures or activities about the hazards of child maltreatment and the knowledge of nurturing children are needed to raise parents' concerns for children's physical and mental health.

We investigated whether sex plays a moderating role in the relationships of the five types of maltreatment and the cumulative effects of child maltreatment with depressive symptoms. There were three significant sex differences (in emotional abuse, emotional neglect and number of maltreatment types) in the associations between child maltreatment and depressive symptoms. Further stratification analyses by sex showed that female students who reported a history of emotional abuse or emotional neglect had a significantly higher risk of depressive symptoms than male students and that the cumulative effect of maltreatment types was significantly greater for women

TABLE 5 | Associations between child maltreatment and depressive symptoms, stratified by sex.

Variables	Male		Female	
	aOR (95% CI)[a]	*P*-value	aOR (95% CI)[a]	*P*-value
Physical abuse (score increase of 1)	1.19 (1.16–1.23)	<0.001	1.20 (1.16–1.24)	<0.001
Emotional abuse (score increase of 1)	1.18 (1.16–1.20)	<0.001	1.24 (1.21–1.26)	<0.001
Sexual abuse (score increase of 1)	1.17 (1.13–1.21)	<0.001	1.20 (1.16–1.25)	<0.001
Physical neglect (score increase of 1)	1.13 (1.10–1.15)	<0.001	1.15 (1.13–1.18)	<0.001
Emotional neglect (score increase of 1)	1.06 (1.05–1.08)	<0.001	1.09 (1.08–1.10)	<0.001
Number of maltreatment types experienced (number increase of 1)	1.64 (1.53–1.75)	<0.001	1.83 (1.71–1.96)	<0.001

[a]*Adjusted for age, living arrangements, household socioeconomic status, academic pressure, relationships with classmates, relationships with teachers, current smoking status, and current alcohol use. The Nagelkerke R^2 values ranged from 0.147 to 0.202.*

The omnibus tests of model coefficients were statistically significant in all the models ($P < 0.001$).

aOR, adjusted odds ratio; CI, confidence interval.

than men. Similarly, Gallo et al. reported that the effect of emotional abuse on depressive disorder was larger for females than for males (55). Moreover, Youssef et al. observed that women exposed to emotional neglect were significantly more likely to have depressive symptoms than men (25). One possible underlying mechanism of this finding is that females who are the victims of emotional maltreatment may be predisposed to develop a negative cognitive style, which may cause female victims to be more vulnerable to depression (55). Rose and Abramson's theory indicated that child emotional maltreatment, such as insulting words, was more likely to contribute to a negative cognitive style than physical and sexual maltreatment because emotional abusers directly instilled depressive cognitions in children (56, 57). Furthermore, owing to the sex differences in HPA axis regulation, maltreated women showed a pattern of neuroendocrine hyporeactivity compared to men who experienced similar degrees of maltreatment, which may be related to different depression prevalence (58). This neurobiological mechanism may indicate why females who reported emotional abuse, emotional neglect, or multiple maltreatment had a higher risk of depressive symptoms. In our study, the magnitude of the effect of sexual abuse on depressive symptoms was greater for females than males in stratification analysis. Differently, a study in the United States found that men who experienced sexual abuse were significantly more depressed than women (26), and a systematic review indicated that the magnitude of the effect of sexual abuse on depressive symptoms was greater for men than women (59). The inconsistency may stem from cultural differences. Oriental culture is relatively conservative (60), and Chinese traditional culture emphasizes female chastity (61). Females victimized by child sexual abuse may internalize the social stigmatization of "victim of sexual abuse" and suffer from a burning sense of shame and self-denial (62). Besides, some female participants in our study may be reluctant to reveal their experiences of sexual abuse, which may lead to an underestimation of the association between sexual abuse and depressive symptoms among females. Sex-specific preventions and interventions may be recommended to better understand the potential sex differences between different types of child maltreatment and depressive symptoms.

Several limitations should be noted in our study. First, the cross-sectional research design limited our capacity to make causal inferences regarding the observed associations. Second, our study used a retrospective self-report method to collect the data, possibly introducing recall and reporting bias. Third, the sample was restricted to school students, excluding drop-outs and students who were absent on the day that the survey was administered. Child maltreatment or depressive symptoms may be more common among students who have dropped out or are absent from school. Fourth, senior students who were facing employment pressure were not included in our study, so the prevalence of depressive symptoms may have been underrated. Fifth, the pseudo R^2 values of the models were small in this study. More factors (e.g., parental depression, history of bullying and substance abuse) are needed to be collected in future studies to better explain the variance in depressive symptoms (10, 12). Sixth, ∼2.3% of college students were below the age of 18 in our study, and written informed consent was provided by one of their legal guardians. Participants whose parents provided consent given may not truly report their experiences of child maltreatment, introducing potential reporting bias. Besides, the investigator would emphasize to participants the anonymity of the questionnaire at the beginning of the survey to control the potential reporting bias. Despite these weaknesses, to our knowledge, this study is the first large-scale study to investigate the associations between history of child maltreatment and depressive symptoms among Chinese college students, with consideration of sex differences.

CONCLUSIONS

In conclusion, five specific types of child maltreatment were associated with a greater risk of depressive symptoms among college students. A cumulative effect of various types of child maltreatment was found, indicating that individuals with experiences of three or more types of maltreatment have an obviously higher risk of depressive symptoms than those with fewer or no maltreatment experiences. Moreover, the effects of emotional abuse/neglect, and the cumulative effects of different

types of child maltreatment on depressive symptoms are stronger in females than males. Further research is needed to confirm and extend these findings and explore the underlying mechanism.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Institutional Review Board of Sun Yat-sen University, School of Public Health. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

CL and LG designed the study and critically revised this manuscript. XC managed the literature searches, summaries of previous related work, and wrote the first draft of the manuscript. GH, YX, XC, SZ, QL, JS, WL, and WW carried out the field research. XC and SZ undertook the statistical analysis. All authors reviewed the manuscript.

FUNDING

This work was supported by National Natural Science Foundation of China (Grant Nos. 81761128030 and 81903339). The funder had no role in the design or conduct of the study; the collection, management, analysis, or interpretation of the data; the preparation, review, or approval of the manuscript; or the decision to submit the manuscript for publication.

ACKNOWLEDGMENTS

The authors thank all of the participants in our study and sincerely acknowledge the technical support from the School of Public Health, Sun Yat-sen University.

REFERENCES

1. Gore FM, Bloem PJN, Patton GC, Ferguson J, Joseph V, Coffey C, et al. Global burden of disease in young people aged 10-24 years: a systematic analysis. *Lancet.* (2011) 377:2093–102. doi: 10.1016/S0140-6736(11)60512-6
2. Duffy ME, Twenge JM, Joiner TE. Trends in mood and anxiety symptoms and suicide-related outcomes among U.S. Undergraduates, 2007-2018: evidence from two national surveys. *J Adolesc Health.* (2019) 65:590–8. doi: 10.1016/j.jadohealth.2019.04.033
3. Voelker R. Mounting student depression taxing campus mental health services. *JAMA.* (2003) 289:2055–6. doi: 10.1001/jama.289.16.2055
4. Chan V, Moore J, Derenne J, Fuchs DC. Transitional age youth and college mental health. *Child Adolesc Psychiatr Clin N Am.* (2019) 28:363–75. doi: 10.1016/j.chc.2019.02.008
5. Bayram N, Bilgel N. The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Soc Psychiatry Psychiatr Epidemiol.* (2008) 43:667–72. doi: 10.1007/s00127-008-0345-x
6. Lei XY, Xiao LM, Liu YN, Li YM. Prevalence of depression among Chinese university students: a meta-analysis. *PLoS ONE.* (2016) 11:e153454. doi: 10.1371/journal.pone.0153454
7. Akhtar P, Ma L, Waqas A, Naveed S, Li Y, Rahman A, et al. Prevalence of depression among university students in low and middle income countries (LMICs): a systematic review and meta-analysis. *J Affect Disord.* (2020) 274:911–9. doi: 10.1016/j.jad.2020.03.183
8. Chen L, Wang L, Qiu XH, Yang XX, Qiao ZX, Yang YJ, et al. Depression among Chinese university students: prevalence and socio-demographic correlates. *PLoS ONE.* (2013) 8:e58379. doi: 10.1371/journal.pone.0058379
9. Naicker K, Galambos NL, Zeng YY, Senthilselvan A, Colman I. Social, demographic, and health outcomes in the 10 years following adolescent depression. *J Adolesc Health.* (2013) 52:533–8. doi: 10.1016/j.jadohealth.2012.12.016
10. Thapar A, Collishaw S, Pine DS, Thapar AK. Depression in adolescence. *Lancet.* (2012) 379:1056–67. doi: 10.1016/S0140-6736(11)60871-4
11. Cukrowicz KC, Schlegel EF, Smith PN, Jacobs MP, Van Orden KA, Paukert AL, et al. Suicide ideation among college students evidencing subclinical depression. *J Am College Health.* (2011) 59:575–81. doi: 10.1080/07448481.2010.483710
12. Malhi GS, Mann JJ. Depression. *Lancet.* (2018) 392:2299–312. doi: 10.1016/S0140-6736(18)31948-2
13. Stoltenborgh M, Bakermans-Kranenburg MJ, Alink LRA, van Ijzendoorn MH. The prevalence of child maltreatment across the globe: review of a series of meta-analyses. *Child Abuse Rev.* (2015) 24:37–50. doi: 10.1002/car.2353
14. Cheng ST, Chan AC. Filial piety and psychological well-being in well older Chinese. *J Gerontol B Psychol Sci Soc Sci.* (2006) 61:P262–9. doi: 10.1093/geronb/61.5.P262
15. Fang X, Fry DA, Ji K, Finkelhor D, Chen J, Lannen P, et al. The burden of child maltreatment in China: a systematic review. *Bull World Health Organ.* (2015) 93:176–85. doi: 10.2471/BLT.14.140970
16. Carr A, Duff H, Craddock F. A systematic review of reviews of the outcome of noninstitutional child maltreatment. *Trauma Violence Abuse.* (2018) 2018:1524838018801334. doi: 10.1177/1524838018801334
17. Paquette G, Tourigny M, Baril K, Joly J, Seguin M. Childhood maltreatment and mental health problems in adulthood: a national study of women in Quebec. *Sante Mentale Au Quebec.* (2017) 42:43–63. doi: 10.7202/1040243ar
18. Coles J, Lee A, Taft A, Mazza D, Loxton D. Childhood sexual abuse and its association with adult physical and mental health: results from a national cohort of young Australian women. *J Interpersonal Viol.* (2015) 30:1929–44. doi: 10.1177/0886260514555270
19. Remigio-Baker RA, Hayes DK, Reyes-Salvail F. Adverse childhood events and current depressive symptoms among women in Hawaii: 2010 BRFSS, Hawaii. *Maternal Child Health J.* (2014) 18:2300–8. doi: 10.1007/s10995-013-1374-y
20. Gonzalez A, Boyle MH, Kyu HH, Georgiades K, Duncan L, MacMillan HL. Childhood and family influences on depression, chronic physical conditions, and their comorbidity: findings from the Ontario Child health study. *J. Psychiatr Res.* (2012) 46:1475–82. doi: 10.1016/j.jpsychires.2012.08.004
21. Glaser D. Child maltreatment. *Psychiatry.* (2008) 7:295–8. doi: 10.1016/j.mppsy.2008.05.001
22. Kisely S, Abajobir AA, Mills R, Strathearn L, Clavarino A, Najman JM. Child maltreatment and mental health problems in adulthood: birth cohort study. *Br J Psychiatry.* (2018) 213:698–703. doi: 10.1192/bjp.2018.207
23. Kuehner C. Why is depression more common among women than among men? *Lancet Psychiatry.* (2017) 4:146–58. doi: 10.1016/S2215-0366(16)30263-2
24. Cunningham TJ, Ford ES, Croft JB, Merrick MT, Rolle IV, Giles WH. Sex-specific relationships between adverse childhood experiences and chronic

obstructive pulmonary disease in five states. *Int J Chronic Obstructive Pulmonary Dis.* (2014) 9:1033–42. doi: 10.2147/COPD.S68226
25. Youssef NA, Belew D, Hao G, Wang X, Treiber FA, Stefanek M, et al. Racial/ethnic differences in the association of childhood adversities with depression and the role of resilience. *J Affect Disord.* (2017) 208:577–81. doi: 10.1016/j.jad.2016.10.024
26. Roxburgh S, MacArthur KR. Childhood adversity and adult depression among the incarcerated: differential exposure and vulnerability by race/ethnicity and gender. *Child Abuse Negl.* (2014) 38:1409–20. doi: 10.1016/j.chiabu.2014.02.007
27. Arnow BA, Blasey CM, Hunkeler EM, Lee J, Hayward C. Does gender moderate the relationship between childhood maltreatment and adult depression? *Child Maltreatment.* (2011) 16:175–83. doi: 10.1177/1077559511412067
28. Jiang LJ, Wang Y, Zhang YN, Li R, Wu HL, Li CY, et al. The reliability and validity of the center for epidemiologic studies depression scale (CES-D) for Chinese university students. *Front Psychiatry.* (2019) 10:12. doi: 10.3389/fpsyt.2019.00315
29. Radloff LS. The use of the center for epidemiologic studies depression scale in adolescents and young adults. *J Youth Adolesc.* (1991) 20:149–66. doi: 10.1007/BF01537606
30. Guo L, Wang T, Wang WX, Fan BF, Xie B, Zhang HM, et al. Association between habitual weekday sleep duration and depressive symptoms among Chinese adolescents: the role of mode of birth delivery. *J Affect Disord.* (2020) 265:583–9. doi: 10.1016/j.jad.2019.11.095
31. Yang HJ, Soong WT, Kuo PH, Chang HL, Chen WJ. Using the CES-D in a two-phase survey for depressive disorders among non-referred adolescents in Taipei: a stratum-specific likelihood ratio analysis. *J Affect Disord.* (2004) 82:419–30. doi: 10.1016/j.jad.2004.04.008
32. Bernstein DP, Ahluvalia T, Pogge D, Handelsman L. Validity of the childhood trauma questionnaire in an adolescent psychiatric population. *J Am Acad Child Adolesc Psychiatry.* (1997) 36:340–8. doi: 10.1097/00004583-199703000-00012
33. He J, Zhong X, Gao Y, Xiong G, Yao S. Psychometric properties of the Chinese version of the Childhood Trauma Questionnaire-Short Form (CTQ-SF) among undergraduates and depressive patients. *Child Abuse Negl.* (2019) 91:102–8. doi: 10.1016/j.chiabu.2019.03.009
34. Guo L, Wang WX, Gao X, Huang GL, Li PS, Lu CY. Associations of childhood maltreatment with single and multiple suicide attempts among older Chinese adolescents. *J Pediatr.* (2018) 196:244. doi: 10.1016/j.jpeds.2018.01.032
35. Bernstein DP, Stein JA, Newcomb MD, Walker E, Pogge D, Ahluvalia T, et al. Development and validation of a brief screening version of the childhood trauma questionnaire. *Child Abuse Neglect.* (2003) 27:169–90. doi: 10.1016/S0145-2134(02)00541-0
36. Torchalla I, Strehlau V, Li K, Schuetz C, Krausz M. The association between childhood maltreatment subtypes and current suicide risk among homeless men and women. *Child Maltreat.* (2012) 17:132–43. doi: 10.1177/1077559512439350
37. Wanklyn SG, Day DM, Hart TA, Girard TA. Cumulative childhood maltreatment and depression among incarcerated youth: impulsivity and hopelessness as potential intervening variables. *Child Maltreat.* (2012) 17:306–17. doi: 10.1177/1077559512466956
38. Xiao D, Wang T, Huang YE, Wang WX, Zhao MJ, Zhang WH, et al. Gender differences in the associations between types of childhood maltreatment and sleep disturbance among Chinese adolescents. *J Affect Disord.* (2020) 265:595–602. doi: 10.1016/j.jad.2019.11.099
39. Steine IM, Winje D, Krystal JH, Bjorvatn B, Milde AM, Gronli J, et al. Cumulative childhood maltreatment and its dose-response relation with adult symptomatology: findings in a sample of adult survivors of sexual abuse. *Child Abuse Negl.* (2017) 65:99–111. doi: 10.1016/j.chiabu.2017.01.008
40. Anda RF, Felitti VJ, Bremner JD, Walker JD, Whitfield C, Perry BD, et al. The enduring effects of abuse and related adverse experiences in childhood - A convergence of evidence from neurobiology and epidemiology. *Eur Arch Psychiatry Clin Neurosci.* (2006) 256:174–86. doi: 10.1007/s00406-005-0624-4
41. Suliman S, Mkabile SG, Fincham DS, Ahmed R, Stein DJ, Seedat S. Cumulative effect of multiple trauma on symptoms of posttraumatic stress disorder, anxiety, and depression in adolescents. *Comprehen Psychiatry.* (2009) 50:121–7. doi: 10.1016/j.comppsych.2008.06.006
42. Khan A, McCormack HC, Bolger EA, McGreenery CE, Vitaliano G, Polcari A, et al. Childhood maltreatment, depression, and suicidal ideation: critical importance of parental and peer emotional abuse during developmental sensitive periods in males and females. *Front Psychiatry.* (2015) 6:42. doi: 10.3389/fpsyt.2015.00042
43. Charak R, de Jong J, Berckmoes LH, Ndayisaba H, Reis R. Assessing the factor structure of the childhood trauma questionnaire, and cumulative effect of abuse and neglect on mental health among adolescents in conflict-affected Burundi. *Child Abuse Negl.* (2017) 72:383–92. doi: 10.1016/j.chiabu.2017.09.009
44. Turner HA, Finkelhor D, Ormrod R. Poly-victimization in a national sample of children and youth. *Am J Prevent Med.* (2010) 38:323–30. doi: 10.1016/j.amepre.2009.11.012
45. Yen C-F, Yang M-S, Chen C-C, Yang M-J, Su Y-C, Wang M-H, et al. Effects of childhood physical abuse on depression, problem drinking and perceived poor health status in adolescents living in rural Taiwan. *Psychiatry Clin Neurosci.* (2008) 62:575–83. doi: 10.1111/j.1440-1819.2008.01836.x
46. Teicher MH, Samson JA. Childhood maltreatment and psychopathology: a case for ecophenotypic variants as clinically and neurobiologically distinct subtypes. *Am J Psychiatry.* (2013) 170:1114–33. doi: 10.1176/appi.ajp.2013.12070957
47. Mello MF, Faria AA, Mello AF, Carpenter LL, Tyrka AR, Price LH. Childhood maltreatment and adult psychopathology: pathways to hypothalamic-pituitary-adrenal axis dysfunction. *Braz J Psychiatry.* (2009) 31(Suppl. 2):S41–8. doi: 10.1590/s1516-44462009000600002
48. Ladd CO, Owens MJ, Nemeroff CB. Persistent changes in corticotropin-releasing factor neuronal systems induced by maternal deprivation. *Endocrinology.* (1996) 137:1212–8. doi: 10.1210/endo.137.4.8625891
49. Entringer S, Buss C, Wadhwa PD. Prenatal stress, development, health and disease risk: a psychobiological perspective-2015 Curt Richter Award Paper. *Psychoneuroendocrinology.* (2015) 62:366–75. doi: 10.1016/j.psyneuen.2015.08.019
50. Heim C, Newport DJ, Mletzko T, Miller AH, Nemeroff CB. The link between childhood trauma and depression: Insights from HPA axis studies in humans. *Psychoneuroendocrinology.* (2008) 33:693–710. doi: 10.1016/j.psyneuen.2008.03.008
51. Stetler C, Miller GE. Depression and hypothalamic-pituitary-adrenal activation: a quantitative summary of four decades of research. *Psychosomatic Med.* (2011) 73:114–26. doi: 10.1097/PSY.0b013e31820ad12b
52. Nemeroff CB. Paradise lost: the neurobiological and clinical consequences of child abuse and neglect. *Neuron.* (2016) 89:892–909. doi: 10.1016/j.neuron.2016.01.019
53. World Health Organization. *Preventing Child Maltreatment: A Guide to Taking Action and Generating Evidence.* Geneva: World Health Organization (2006).
54. Chao RK. Beyond parental control and authoritarian parenting style: understanding Chinese parenting through the cultural notion of training. *Child Dev.* (1994) 65:1111–9. doi: 10.2307/1131308
55. Gallo EAG, De Mola CL, Wehrmeister F, Gonçalves H, Kieling C, Murray J. Childhood maltreatment preceding depressive disorder at age 18 years: a prospective Brazilian birth cohort study. *J Affect Disord.* (2017) 217:218–24. doi: 10.1016/j.jad.2017.03.065
56. Gibb BE, Alloy LB, Abramson LY, Rose DT, Whitehouse WG, Donovan P, et al. History of childhood maltreatment, negative cognitive styles, and episodes of depression in adulthood. *Cogn Therapy Res.* (2001) 25:425–46. doi: 10.1023/A:1005586519986
57. Rose DT, Abramson LY. Developmental predictors of depressive cognitive style: Research and theory. In: *Rochester Symposium of Developmental Psychopathology* (Rochester, NY) (1992).
58. Doom JR, Cicchetti D, Rogosch FA, Dackis MN. Child maltreatment and gender interactions as predictors of differential neuroendocrine profiles. *Psychoneuroendocrinology.* (2013) 38:1442–54. doi: 10.1016/j.psyneuen.2012.12.019

59. Gardner MJ, Thomas HJ, Erskine HE. The association between five forms of child maltreatment and depressive and anxiety disorders: A systematic review and meta-analysis. *Child Abuse Neglect*. (2019) 96:104082. doi: 10.1016/j.chiabu.2019.104082
60. Woo JS, Brotto LA, Gorzalka BB. The role of sex guilt in the relationship between culture and women's sexual desire. *Arch Sex Behav*. (2011) 40:385–94. doi: 10.1007/s10508-010-9609-0
61. Chu D. The production of erotica: photobooks of teenage models in Hong Kong. *J Sex Res*. (2013) 50:653–63. doi: 10.1080/00224499.2012.675529
62. Sui SG, King ME, Li LS, Chen LY, Zhang Y, Li LJ. Posttraumatic stress disorder among female victims of sexual assault in China: prevalence and psychosocial factors. *Asia Pac Psychiatry*. (2014) 6:405–13. doi: 10.1111/appy.12155

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 01 October 2021
doi: 10.3389/fpsyt.2021.650700

The Impact of Psychopathology Associated With Childhood Trauma on Quality of Life in Portuguese Adolescents: A Two-Wave Longitudinal Study

Ricardo Pinto[1]*, *Maria Vieira De Castro*[2], *Laura Silva*[1], *Inês Jongenelen*[1], *Angela Maia*[3] and *Alytia A. Levendosky*[4]

[1] HEI-Lab: Digital Human-Environment Interaction Lab, Faculty of Psychology, Education and Sports, Universidade Lusófona do Porto, Porto, Portugal, [2] Institute of Psychology and Educational Sciences, Lusíada University of Porto, Porto, Portugal, [3] School of Psychology, University of Minho, Braga, Portugal, [4] Department of Psychology, College of Social Science, Michigan State University, East Lansing, MI, United States

OPEN ACCESS

Edited by:
Jutta Lindert,
University of Applied Sciences Emden Leer, Germany

Reviewed by:
Christos Theleritis,
King's College London, United Kingdom
Omneya Ibrahim,
Suez Canal University, Egypt

***Correspondence:**
Ricardo Pinto
ricardo.pinto@ulp.pt

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: 07 January 2021
Accepted: 07 September 2021
Published: 01 October 2021

Citation:
Pinto R, De Castro MV, Silva L, Jongenelen I, Maia A and Levendosky AA (2021) The Impact of Psychopathology Associated With Childhood Trauma on Quality of Life in Portuguese Adolescents: A Two-Wave Longitudinal Study. Front. Psychiatry 12:650700. doi: 10.3389/fpsyt.2021.650700

Introduction: The aim of this study was to explore the mediating effect of psychopathology between childhood adversity and trauma and quality of life (QOL) in adolescents. The second aim of the study was testing the moderation by social support of this mediation effect.

Methods : Self-reports of childhood adversity and trauma, QOL, social support, and psychopathology were collected from 150 Portuguese adolescents' who had been exposed to at least one traumatic event or one childhood adversity (M_{age} = 16.89, SD = 1.32). The surveys were administered at two time points with an approximate time interval of 1 year.

Results: Indirect effects were observed for depression ($B = -0.33$, CI [−0.62, −0.11]), somatization ($B = -0.52$, CI [−0.82, −0.23]), and post-traumatic stress symptoms (PTSS) ($B = -0.23$, CI [−0.45, −0.01]), but not for anxiety ($B = 0.20$, CI [−0.08, 0.50]). A moderated mediation was found between social support and depression ($B = -0.10$, CI [−16, −0.04]), and PTSS ($B = 0.03$, CI [−0.1, −0.05]), but not for somatization ($B = -0.02$, CI [−0.8, 0.05]).

Conclusions: We found that depression and somatization were strong mediators of the relationship between adversity/trauma and QOL, whereas PTSS was moderately mediated this relationship. Anxiety did not mediate this relationship. The moderated-mediation effect of social support was only found for depression and PTSS. The improvement of QOL in adolescents exposed to childhood adversity and trauma should include the assessment of psychopathology symptoms and social support, with the aim of identifying risk and protective factors.

Keywords: adolescents, adversity, quality of life, psychopathology, trauma, social support

INTRODUCTION

One of the most consistent findings in mental health field is that childhood adversity and trauma are strong determinants of mental health problems throughout the lifespan (1, 2). Childhood adversity and trauma have been related to several later psychiatric disorders, including depression, anxiety disorders, and post-traumatic stress symptoms (3). Maltreated children are especially at risk for developing insecure/disorganized attachments with their primary caregiver (4), which in turn may serve as an underlying mechanism through which children with maltreatment experiences develop future psychopathology (3). In addition to psychopathology, an outcome that is frequently ignored by researchers, but very important to individuals, is quality of life (QOL). QOL is a broader construct that encompasses different aspects of life and is defined here as the perceptions of physical, emotional, and social functioning which are the core dimensions of health as delineated by the World Health Organization (5), as well as the school functioning (6, 7). This study examines whether psychopathology may be a mechanism through which childhood adversity and trauma affects quality of life for adolescents.

Children who experience adversity and trauma tend to develop negative expectations regarding the availability and trustworthiness of others, as well as mental representations of the self as incompetent and unworthy (3). From a developmental psychopathology perspective (8), adverse childhood experiences and traumas are proximal risk factors that occurred in critical stages during the childhood that interfere with a child's normal development and commence a trajectory of vulnerability. The common sequelae of childhood maltreatment include representations of the self as incompetent and unworthy, neurobiological changes that produces social information processing biases, altered patterns of emotional reactivity and emotion regulation, and reward processing (9) all serve to leave children more vulnerable to later psychopathology (10). More specifically, they may be particularly sensitive to developing psychopathology during adolescence, as it is a sensitive period for negative interpersonal events due to the intensified emotional potency of interpersonal interactions during this developmental period (11, 12). Psychopathology during adolescence has consequences for physical, cognitive and emotional functioning (12–15), and academic functioning (16) as adolescents struggled to navigate their increasingly complex social worlds. These negative consequences for functioning inherently result in a worse quality of life for these adolescents. In contrast, abused children who do not develop psychopathology during adolescence are resilient and thus are likely to have a better quality of life. In other words, the relationship between childhood adversity/maltreatment and quality of life in adolescence is mediated by adolescent psychopathology.

However, to our knowledge, there is no current evidence about this mediating hypothesis. A previous systematic review of the literature between the years 1976–2006 (17) only found four studies that evaluated QOL for adult survivors of child maltreatment. Similarly, a recent systematic review found a few studies on QOL for maltreated children and adolescents (18). Specifically, Gospodarevskaya (19), in a sample with 993 adolescents who experienced childhood sexual abuse, found that psychopathology, namely post-traumatic stress, corresponded to significantly lower levels of quality of life. Additionally, Chan (20), in a sample of 18,341 adolescents, found that child victims of violence were more likely to report PTSD and depressive symptoms, self-harm ideation, and poor QOL. However, neither of these studies examined the potential mediation effect of psychopathology between the relationship of childhood adversity and trauma and subsequent QOL in adolescents.

One factor that can be protective against maltreatment and trauma is social support (21). According to the developmental psychopathology perspective (8), social support is one of the most important protective factors within the broader constellation of risks and vulnerabilities that children experience. Social support can be stress-buffering as a protective factor when children encounter later developmental challenges. Among children exposed to adversity, social support can buffer the stress caused by marital conflict, domestic violence, and parental affective disturbances (22), and prevent the development and maintenance of psychopathology later in adolescence. While social support may aid children in coping and help them to develop better social skills, the absence of it may lead to isolation from family and peer groups or dysfunctional social relationships, that can contribute to the development of psychopathology, with negative impact on QOL (23).

Therefore, the aim of this study was to explore the mediating effect of psychopathology between childhood adversity and trauma and QOL in adolescents. The second aim of the study was testing the moderation by social support of this mediation effect. Data for this study came from surveys administered in two separate waves of data collection, with an approximate time interval of 1 year, to examine the distal effects of childhood adversity and trauma (time 1, retrospectively assessed), the mediation effect of psychopathology symptoms (time 1), on outcome variable QOL (time 2).

METHODS

Participants

We contacted 232 adolescents living in institutions run by Child Protective Services (CPS) and 271 adolescents attending vocational schools. We chose these two places for recruitment because of the high-risk nature of the adolescent population involved in these programs. Our inclusion criteria included adolescents between the ages of 13 and 17. This 13-year age criterion is due to the minimum age to enter a vocational school before which the student must have completed 9 years of schooling. Another inclusion criterion was that the adolescent had to report being exposed to at least one traumatic event or one childhood adversity. Exclusion criteria was having intellectual disability that could compromise the understanding of the informed consent and the protocol questions. We obtained written informed consent from both adolescents and their parents or legal guardians to participate in the study from 210 adolescents, but only 183 met the criteria

to participate in this study, mean of the age of 16 years old ($M = 15.99$, $SD = 1.25$), ranged between 13 and 18 years old.

At the second wave, ∼1 year after the first assessment, the expected time to demonstrate effects on the quality of life (24–26), we attempted to recontact all the study participants and were successfully in finding 150 of them. The answer to whether this was enough time for any difference in the quality of life to be evident must be clearly stated and supported. Thus, the final sample of the current study is 150 participants. The mean of the age of this sample was 17 years old ($M = 16.89$, $SD = 1.32$), ranging between 14 and 19 years old, including 67 (44.7%) males and 83 (55.3%) females. In total, 73 (48.7%) of the adolescents had been previously identified by CPS due to exposure to child abuse, neglect, or other family dysfunction. In terms of mothers' and fathers' educational levels, 47 (31.3%) fathers had elementary school, 48 (32%) middle school, 45 (30%) high school, and 8 (5.3%) university degree; 42 (28%) mothers had elementary school, 70 (46.7%) middle school, 32 (21.3%) high school, and 6 (4%) university degree. In relation to the family income, most of the adolescents ($n = 80$, 53.4%) reported a monthly household income between $270 and $800 U.S. dollar, corresponding to low socioeconomic status. There were no differences between those who participated in the second wave from those who did not participate in terms of age [$t_{(187)} = 1.57$, $p = 118$], trauma exposure [$t_{(186)} = 1.74$, $p = 08$], and PTSD symptoms [$t_{(187)} = 0.407$, $p = 684$]. However, we found differences in terms of childhood adversity and trauma exposure, [$t_{(186)} = 3.07$, $p = 002$]. The ones who dropped out had more childhood adversity and traumas ($M = 9.32$; SD = 3.53) compared to those who participated in both assessments ($M = 7.02$; $SD = 4.25$).

Procedure

The present study is part of a larger longitudinal research project on the impact of traumatic events on adolescents in the North of Portugal (27–29). All procedures performed in this study were in accordance with the APA ethical standards. The study was approved by the ethics committee of the [removed for blind review]. In order to recruit participants, 14 institutions run by Child Protective Services (CPS) and 16 vocational schools were contacted. The CPS institutions and vocational schools were initially contacted by e-mail and then by telephone with the purpose of scheduling an initial interview. Upon authorization by these institutions, the data collection started. The adolescents who agreed to participate were given more detailed information about the study and delivered a written informed consent to be signed by parents or legal guardians, in order to allow participation in the study. The informed consent was obtained before beginning administration of the questionnaires. The questionnaires were administered by three trained psychologists in a private room for the purposes of confidentiality. In addition, adolescents were able to send an email to the researchers if they wished to have access to their results or felt the need to talk with the researchers about any information contained in the protocol.

TABLE 1 | Means and standard deviation of key measures.

Variables	Total sample ($N = 150$)			
	M	*SD*	Minimum	Maximum
Quality of life	20.40	13.04	0	59
Cumulative adversity	7.49	4.20	0	19
PTSD symptoms	22.89	18.20	0	67
Depression symptoms	6.31	5.31	0	24
Anxiety symptoms	4.13	3.92	0	18
Somatic symptoms	4.15	4.42	0	20
Social support	43.23	8.71	20	78

It was used the total score for all variables.

Measures

A Demographic Questionnaire

A demographic questionnaire, composed of multiple-choice questions, was used to collect information about age, gender, and family information (i.e., number of household, educational level of the parents, income, and housing changes). This measure also included items about current residence (e.g., with parents, with grandparents, institution, etc.) and if the adolescent ever was identified by Child Protective Services (CPS).

The Life Events Checklist for DSM 5

The Life Events Checklist for DSM 5 (LEC-5) [(30); Portuguese version: (removed for blind review)] is a self-report measure developed to evaluate traumatic events in an individual's life according to the DSM 5. It evaluates exposure to 16 potentially traumatic events (e.g., natural disasters, accidents, and sexual assault) and includes an additional item where respondents could report another traumatic event that was not listed in the 16 previous items. For each event, respondents indicate their level of exposure (e.g., direct experience; witnessing). Additionally, participants were asked to select the most traumatic event they had experienced, and to indicate how long ago it had happened. The LEC-5 has been demonstrated to be a good measure of exposure to traumatic events and has convergent validity with measures of trauma related psychopathology (31). The study of the original version showed Pearson coefficients ranging from 0.44 to 0.48 between LEC and PTSD symptom severity, and 0.27 and 0.32 between LEC and measures of anxiety and depression, respectively. The Pearson coefficients for the present sample are reported in **Table 1**.

Adverse Childhood Experiences Study Questionnaire

Adverse Childhood Experiences Study Questionnaire [ACE: (32); Portuguese version: (removed for blind review)] is a retrospective self-report measure which assesses the occurrence of adverse experiences in childhood. This questionnaire includes detailed information on 10 adverse childhood experiences (e.g., emotional abuse, physical abuse, sexual abuse, exposure to domestic violence, substance abuse in the family environment, divorce or parental separation, family member, mental illness or suicide, physical neglect and emotional neglect), organized into two areas: children's experiences and household dysfunction [removed for

blind review]. Responses range from 0 (never) to 5 (very often), with the exception of sexual abuse, for which a dichotomous response (yes or no) was given and all items were dichotomized based on how often the experiences occurred [see (32)]. We then computed a total score of the adverse experiences exposure for each subject ranged from zero to 10. The study of the original scale demonstrated good test-retest reliability (33). In the present study, the internal consistency was 0.82.

The Child PTSD Symptom Scale—V

The Child PTSD Symptom Scale—V (CPSS-V) [(34); Portuguese version: (removed for blind review)] is a self-report measure that aims to assess the severity of PTSD symptoms presented in the past month by children and adolescents after having being exposed to a traumatic event. The inventory comprises 20 items corresponding to PTSD symptoms according to the criteria of the DSM-5. Participants rate the frequency that they experience each symptom using a 4-point Likert scale, ranging from 0 (never), to 4 (6 or more times per week/ almost always), yielding a total score of 80 possible points, indicating PTSD symptom severity. Examples of items are "Having feelings in your body when you remember what happened (for example, sweating, heart beating fast, stomach or head hurting)" and "Trying not to think about, talk about, or have feelings about it [the event]." The original study demonstrated an excellent internal consistency for the total score ($\alpha = 0.92$), and the internal consistency for each scale ranged from acceptable to good, meaning: for criterion B ($\alpha = 0.81$), for criterion C ($\alpha = 0.63$); for criterion D ($\alpha = 0.86$) and for criterion E ($\alpha = 0.72$) (35).

Brief Symptom Inventory

Brief Symptom Inventory (BSI) [(36); Portuguese version: (37)] is a well-established self-report instrument to assess psychological distress. The BSI comprises 53 items on a 5-point rating scale that ranges from 0 (not at all) to 4 (extremely). The inventory includes nine symptom dimensions: somatization, obsessive compulsivity, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. For the purposes of the present study, we only used the depression, anxiety and somatization subscales. Example of items are "Feeling no interest in things" and "Feeling tense or keyed up." Higher scores reflect higher depression, anxiety, and somatization symptoms. The studies of the original scale have demonstrated good internal consistency for each of the scales, ranging from 0.71 to 0.85 (36). The internal consistency of the present sample was 0.87 for depression, 0.86 for anxiety, and 0.83 for somatization.

The Scale of Satisfaction With Social Support for Children and Adolescents

The Scale of Satisfaction with Social Support for Children and Adolescents (ESSS-CA) (38) is a self-report measure that assesses the perception of social support in children and adolescents. The original version includes 15 items, but we used a reduced version of 12 items to assess two dimensions of social support, as satisfaction and activities, using a five-point Likert scale ranging from "totally agree" to "strongly disagree." Example of items are "I'm satisfied with the number of friends I have" and "When I need to vent, I can easily find someone to do it." A total score was computed by summing all items, with higher scores indicating a greater degree of social support satisfaction. The study of the original scale demonstrated acceptable to good internal consistency, between 0.69 and 0.84 (38). The internal consistency for the present sample was 0.75.

Pediatric Quality of Life Inventory Version 4.0

Pediatric Quality of Life Inventory Version 4.0 [(7); Portuguese version: Ferreira et al. (39)]. The 23-item PedsQL^{TM} 4.0 Generic Core Scales encompass: (1) Physical Functioning (8 items), (2) Emotional Functioning (5 items), (3) Social Functioning (5 items), and (4) School Functioning (5 items). The self-report version for 13–18 years was used in this study. The instructions ask how much of a problem each item has been during the past 1 month. A 5-point Likert response scale is utilized across child self-report (0 = never a problem; 1 =almost never a problem; 2 = sometimes a problem; 3 =often a problem; 4 = almost always a problem). Items are reverse-scored and linearly transformed to a 0–100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, and 4 = 0), so that higher scores indicate better QOL. Scale scores were computed as the sum of the items divided by the number of items answered (thus accounting for missing data).

Data Analysis

Data analyses were carried out using the SPSS version 20 for Windows. We calculated a composite index (*Z*-scored and then added) of childhood adversity and trauma as the independent variable. Mediation analyses were conducted to determine direct and indirect effects with 5,000 bootstrapped samples and bias-corrected 95% confidence intervals (BCa CI) using the SPSS PROCESS macro (Model 4) (40). The moderated mediation model was analyzed by Hayes's PROCESS macro (Model 7). No correction was made for missing values in the reported analyses considering the low incidence observed.

RESULTS

Descriptive data of key measures are presented in **Table 1**. Quality of life was significantly associated with all study variables (**Table 2**).

Testing the First Hypothesis—Mediation Model

The cumulative adversity was input into the model as predictor, the PTSD symptoms, somatization, depression, and anxiety symptoms were included as mediators, and QOL as outcome variable. The overall regression model testing the effect of cumulative adversity on quality of life, with proposed mental health mediators was statistically significant, $F_{(7,159)} = 22.09$, $p < 0.001$, accounting for 49% of the variance. Age and gender were included as covariates in the model.

Path a: Effect of Cumulative Adversity on Mediators

The findings indicated a statistically significant effect of the cumulative adversity on depression ($B = 0.47$, SE = 0.10, $p <$

TABLE 2 | Correlations of key measures.

Variables	1	2	3	4	5	6	7	8	9
1. Quality of life	–								
2. Cumulative adversity	−0.44***	–							
3. PTSD criterion B	−0.44***	0.31***	–						
4. PTSD criterion C	−0.29**	0.24**	0.62***	–					
5. PTSD criterion D	−0.39***	0.34***	0.75***	0.58***	–				
6. PTSD criterion E	−0.42***	0.35***	0.70***	0.53***	0.73***	–			
7. Depression symptoms	−0.48***	0.43***	0.57***	0.38***	0.62***	0.58***	–		
8. Anxiety symptoms	−0.41***	0.36***	0.52***	0.36***	0.57***	0.59***	0.66***	–	
9. Somatic symptoms	−0.47***	0.44***	0.51***	0.38***	0.59***	0.60***	0.56***	0.77***	–
10. Social Support	0.39***	−0.45***	−0.17	−0.16	−0.24**	−0.25**	−0.35***	−0.19*	−0.20*

*$p < 0.05$, two-tailed. **$p < 0.01$, two-tailed. ***$p < 0.001$.

0.001, CI [0.28, 0.66], anxiety ($B = 0.37$, SE = 0.07, $p < 0.001$, CI [0.22, 0.52], somatization ($B = 0.45$, SE = 0.08, $p < 0.001$, CI [0.29, 0.62], and PTSS ($B = 0.08$, SE = 0.02, $p < 0.001$, CI [0.05, 0.12]).

Path b: Effect of Mediators on Quality of Life

Several of the mediators, depression ($B = -0.83$, SE = 0.30, $p < 0.01$, CI [−1.43, −0.23], somatization ($B = -0.89$, SE = 0.40, $p < 0.05$, CI [−1.68, −0.23], and PTSS ($B = -0.23$, SE = 0.09, $p < 0.05$, CI [−0.45, −0.02]), significantly predicted quality of life. However, anxiety was not a significant mediator ($B = 0.47$, SE = 0.48, $p = 0.33$, CI [−0.49, 1.42].

Paths c and c′: Direct and Indirect Effects on Quality of Life

The total effect of the cumulative adversity on quality of life was significant ($B = -0.96$, SE = 0.23, $p < 0.001$, CI [−1.41, −0.50]), but the effect was completely lost ($B = -0.08$, SE = 0.20, $p = 0.69$, CI [−0.46, 0.31]), when indirect effects were included for depression ($B = -0.33$, BSE = 0.13, CI [−0.62, −0.11], somatization ($B = -0.52$, BSE = 0.15, $p < 0.001$, CI [−0.82, −0.23], and PTSS ($B = -0.23$, BSE = 0.11, CI [−0.45, −0.01]). However, this was not true for the indirect effects of anxiety symptoms, ($B = 0.20$, BSE = 0.14, CI [−0.08, 0.50]) (see **Figure 1**).

Testing for the Moderated Mediation

In Hypothesis 2, we expected that social support would buffer the indirect effects between psychopathology and quality of life. Social support ($B = 0.46$, SE = 0.12, $p < 0.001$, CI [0.20, 0.71]) was a significant predictor of quality of life. An indirect effect (moderating effect) of the highest order interaction between the depression and social support was significant ($B = -0.10$, SE = 0.03, $p < 0.001$, CI [−16, −0.04]), but only at moderate, CI = (−1.43, −0.26), and high, CI = (−2.63, −0.79), levels of social support (see **Figure 2**). An indirect effect between PTSS and social support was significant ($B = -0.03$, SE = 0.01, $p = 0.01$, CI [−0.1, −0.05]), at low, CI = (−0.54, −0.25), moderate, CI = (−0.42, −0.17), and high, CI = (−0.37, −0.02), levels of social support. No indirect effect was found for somatization and social support ($B = -0.02$, SE = 0.03, $p = 0.66$, CI [−0.8, 0.05]).

DISCUSSION

This study explored the mediation effect of psychopathology between childhood adversity and trauma and quality of life in adolescents. The second aim was testing the moderation of the mediation effect through the social support. Data for this study come from surveys administered in two separate waves of data collection, with an approximate time interval of 1 year.

The first hypothesis of a mediation effect of psychopathology symptoms between childhood adversity and trauma and QOL was confirmed, except for anxiety symptoms. Depression and somatization had a large effect and PTSS a medium effect as mediators. Following this hypothesis, a previous study found that psychopathology was a mediator between obesity and QOL among children and adolescents (23), but the authors did not explore the types of psychopathology. According to the authors, it is reasonable to assume that the negative emotions and maladaptive schemas caused by having psychological problems will affect the adolescent's QOL. The current findings are important in suggesting that impaired QOL in adolescents exposed to adverse childhood experiences and trauma is related to their psychopathology symptoms and not their violence exposure *per se*. Considering a developmental perspective, aspects of environmental context that are difficult to modify, such as childhood adversity, can work as distal risk factors for the emergence of psychopathology (41), which in turn, psychopathology may have the role of proximal factor for the impaired QOL. Therefore, the advantage in identifying these proximal risk factors for the impaired QOL is because they are often easier to modify than distal risk factors (42). Additionally, this finding could mean that adolescents who were maltreated and did not develop psychopathology are resilient and thus the childhood adversity and trauma had no impact on quality of life. According to developmental models, individual differences in pathways toward normal and abnormal functioning arise from the individual's particular profile of risk and protective

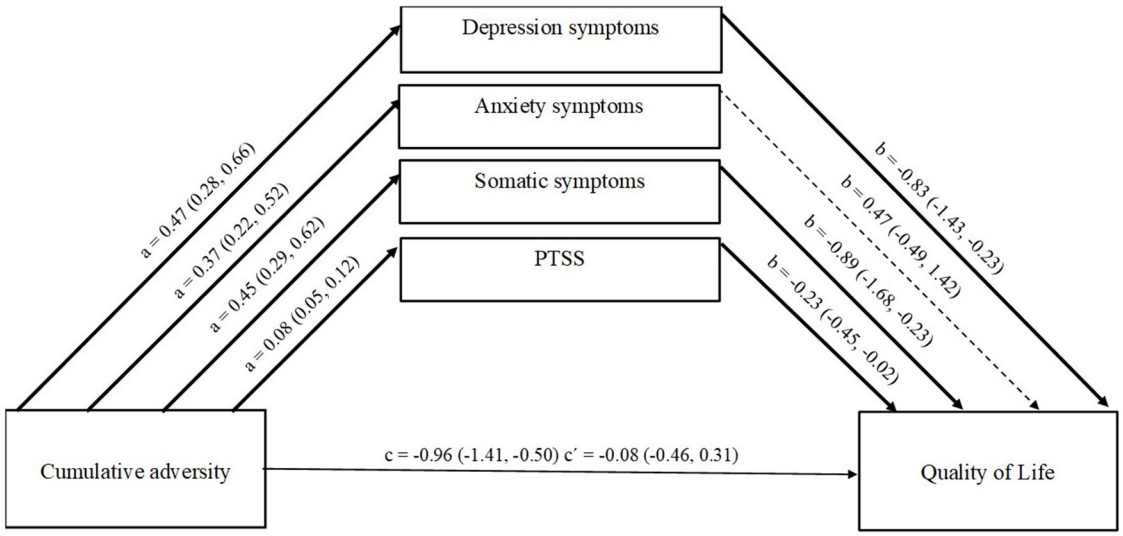

FIGURE 1 | Effect of multiple mediators on the relationship between Cumulative Adversity and Quality of Life. a, effect of TLEs on mediators; b, effect of mediators on Quality of Life; c, direct effect of TLEs on Quality of Life; c′, indirect effect of TLEs on Quality of Life through the four mediators. Values are unstandardized coefficients and Bootstrap Confidence Intervals.

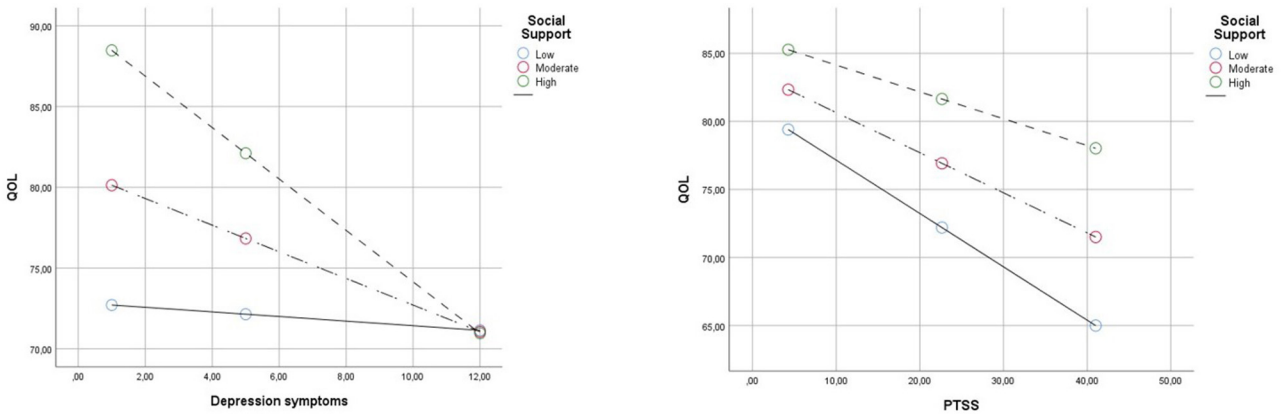

FIGURE 2 | Simple slopes representing the relationship between PTSS/Depression Symptoms and QOL scores at −1 SD, mean, and +1 SD values of social support scores.

experiences as accumulated through development (43, 44). In practice, increasing the quality of life in adolescents involves reducing psychopathology, since it is not possible to prevent them from being previously exposed to trauma and violence.

This perspective emphasizes that childhood adversity and trauma are not directly causally linked with QOL during the adolescence, but are instead mediated by the risk and moderated by protective factors that follow. Based on the second hypothesis, social support moderated the mediation effect of depression and PTSS, but not for somatization. When examining the moderation of the mediation effect of depression, it was noticeable in the simple slope that at high levels of depression, social support did not attenuate the impact on QOL, while it did for high levels of PTSD. These puzzling findings emphasize the importance of further studying the role of multiple types of psychopathology as mechanisms underlying the associations between childhood adversity and trauma and QOL, identifying the different effects that can have. These different findings between depression and PTSD may be because the social support is not static, but is given and received in the context of relationships. It depends on the individual's ability to create and maintain supportive social relationships, to interact with the others, and to ask for help when needed, and importantly, high levels of depression would likely cause an adolescent to alienate others and/or resist social support and to become further isolated within their families, peer groups, and communities, affecting their own QOL.

The ability to receive social support is founded on the early parent-child relationships by creating provisional

representations about the quality of support they can expect from others they encounter (22). However, within abusive families, it may shatter the basic assumptions about themselves and the others, resulting in the development of self-other schemas of fear, insecurity, unpredictably, distrust, self-blame, and emotions of guilt, shame, and anger. These negative basic beliefs and emotions may compromise the adolescent's ability to seek help, to enjoy support and caring that demands trust in others, which in turn will predispose adolescents for development of psychopathology and subsequently worse QOL. This explains why the adolescents with lower levels of social support have higher levels of PTSS and lower levels of QOL. On the other hand, social support is not limited to parents. Especially in adolescence, there is an extension of social support within natural social networks, such as peer relationships, teachers, extended family, neighbors, coaches, and mentors. Adolescents who have been able to benefit from their extant support are those for whom social support may be protective and thus helps to prevent the development of psychopathology, leading to a better quality of life, despite having been victims of childhood adversity and trauma.

A few limitations of this study should be noted. First, the study relied on a non-representative sample of adolescents. Future studies should try to include representative samples of adolescents, for example by obtaining funding for national projects and having partnerships with entities that support young people at risk. Second, our longitudinal study is limited by only having two waves of data collection, 1 year apart. In future research, it is necessary to replicate our findings over a more extended longitudinal study, thus allowing us to examine potential non-linear effects. Third, the variables in this study were measured in terms of self-report questionnaires. Additional research should consider the use of structured clinical interviews and multiple sources (e.g., parents, teachers, and observations).

Despite these limitations, the present study makes a valuable contribution to the literature on QOL in adolescents with history of childhood adversity and trauma. Prevention programs should include the assessment of adversity and trauma in their protocols, together with the assessment of psychopathology symptoms and social support, with the aim of identifying risk and protective factors and thus preventing the decrease in QOL in adolescents. Nevertheless, research should be conducted to elucidate the puzzling finding exploring why some types of psychopathology may function as different mechanisms in the relationship between adversity and trauma and subsequent quality of life in adolescents.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of the University Lusófona of Porto. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

LS collected the data. RP, MD, IJ, and AM analyzed and interpreted the data. RP and MD wrote the current version of the manuscript with critical revision of AL. All authors contributed substantially to the conception and design of the study, critical revision, and approved the final version of the article.

REFERENCES

1. Cicchetti D, Valentino K. *An Ecological-Transactional Perspective on Child Maltreatment: Failure of the Average Expectable Environment and Its Influence on Child Development*. John Wiley & Sons, Inc. (2006).
2. Shonkoff JP, Garner AS, Siegel BS, Dobbins MI, Earls MF, McGuinn L, et al. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics.* (2012) 129:e232–46. doi: 10.1542/peds.2011-2663
3. Cicchetti D, Doyle C. Child maltreatment, attachment and psychopathology: mediating relations. *World Psychiatry*. (2016) 15:89. doi: 10.1002/wps.20337
4. Cicchetti D, Olsen K. The developmental psychopathology of child maltreatment. In: *Handbook of Developmental Psychopathology*. (1990). p. 261–79.
5. World Health Organization. *Constitution of the World Health Organization: Basic Document.* Geneva: World Health Organization (1948).
6. Varni JW, Seid M, Rode CA. The PedsQL^{TM}: measurement model for the pediatric quality of life inventory. *Med Care.* (1999) 126–39. doi: 10.1097/00005650-199902000-00003
7. Varni JW, Seid M, Kurtin PS. PedsQL® 4.0: reliability and validity of the Pediatric Quality of Life Inventory® Version 4.0 Generic Core Scales in healthy and patient populations. *Med Care.* (2001) 800–12. doi: 10.1097/00005650-200108000-00006
8. Cicchetti D, Curtis WJ. The developing brain and neural plasticity: implications for normality, psychopathology, and resilience. In: Cicchetti D, Cohen DJ, editors. *Developmental Psychopathology: Developmental Neuroscience.* Hoboken, NJ: John Wiley and Sons Inc. (2006). p. 1–64.
9. McLaughlin KA, DeCross SN, Jovanovic T, Tottenham N. Mechanisms linking childhood adversity with psychopathology: learning as an intervention target. *Behav Res Ther.* (2019) 118:101–9. doi: 10.1016/j.brat.2019.04.008
10. Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: a global public-health challenge. *Lancet.* (2007) 369:1302–13. doi: 10.1016/S0140-6736(07)60368-7
11. McLaughlin KA, Garrad MC, Somerville LH. What develops during emotional development? A component process approach to identifying sources of psychopathology risk in adolescence. *Dialog Clin Neurosci.* (2015) 17:403–10. doi: 10.31887/DCNS.2015.17.4/kmclaughlin
12. Nelson EE, Leibenluft E, McClure EB, Pine DS. The social re-orientation of adolescence: a neuroscience perspective on the process and its relation to psychopathology. *Psychol Med.* (2005) 35:163–74. doi: 10.1017/S0033291704003915
13. Epkins CC. Cognitive specificity in internalizing and externalizing problems in community and clinic-referred children. *J Clin Child Psychol.* (2000) 29:199–208. doi: 10.1207/S15374424jccp2902_6
14. Brunnekreef AJ, De Sonneville LM, Althaus M, Minderaa RB, Oldehinkel AJ, Verhulst FC, et al. Information processing profiles of internalizing and externalizing behavior problems: evidence from a population-based

sample of preadolescents. *J Child Psychol Psychiatry*. (2007) 48:185–93. doi: 10.1111/j.1469-7610.2006.01695.x
15. Morin AJ, Arens AK, Maïano C, Ciarrochi J, Tracey D, Parker PD, et al. Reciprocal relationships between teacher ratings of internalizing and externalizing behaviors in adolescents with different levels of cognitive abilities. *J Youth Adolesc*. (2017) 46:801–25. doi: 10.1007/s10964-016-0574-3
16. Suldo S, Thalji A, Ferron J. Longitudinal academic outcomes predicted by early adolescents' subjective well-being, psychopathology, and mental health status yielded from a dual factor model. *J Posit Psychol*. (2011) 6:17–30. doi: 10.1080/17439760.2010.536774
17. Prosser LA, Corso PS. Measuring health-related quality of life for child maltreatment: a systematic literature review. *Health Qual Life Outcomes*. (2007) 5:42. doi: 10.1186/1477-7525-5-42
18. Weber S, Jud A, Landolt MA. Quality of life in maltreated children and adult survivors of child maltreatment: a systematic review. *Qual Life Res*. (2016) 25:237–55. doi: 10.1007/s11136-015-1085-5
19. Gospodarevskaya E. Post-traumatic stress disorder and quality of life in sexually abused Australian children. *J Child Sex Abus*. (2013) 22:277–96. doi: 10.1080/10538712.2013.743953
20. Chan KL. Victimization and poly-victimization among school-aged Chinese adolescents: prevalence and associations with health. *Prev Med*. (2013) 56:207–10. doi: 10.1016/j.ypmed.2012.12.018
21. Runtz MG, Schallow JR. Social support and coping strategies as mediators of adult adjustment following childhood maltreatment. *Child Abuse Neglect*. (1997) 21:211–26. doi: 10.1016/S0145-2134(96)00147-0
22. Thompson RA, Flood MF, Goodvin R. Social support and developmental psychopathology. In: Cicchetti D, Cohen DJ, editors. *Developmental Psychopathology: Risk, Disorder, and Adaptation*. Hoboken, NJ: John Wiley and Sons, Inc. (2006). p. 1–37.
23. Steinsbekk S, Jozefiak T, Ødegård R, Wichstrøm L. Impaired parent-reported quality of life in treatment-seeking children with obesity is mediated by high levels of psychopathology. *Qual Life Res*. (2009) 18:1159. doi: 10.1007/s11136-009-9535-6
24. Cramm JM, Strating MM, Nieboer AP. The importance of general self-efficacy for the quality of life of adolescents with diabetes or juvenile rheumatoid arthritis over time: a longitudinal study among adolescents and parents. *Front Pediatr*. (2013) 1:40. doi: 10.3389/fped.2013.00040
25. Leuteritz K, Friedrich M, Nowe E, Sender A, Stöbel-Richter Y, Geue K. Life situation and psychosocial care of adolescent and young adult (AYA) cancer patients-study protocol of a 12-month prospective longitudinal study. *BMC Cancer*. (2017) 17:82. doi: 10.1186/s12885-017-3077-z
26. Otto C, Haller AC, Klasen F, Hölling H, Bullinger M, Ravens-Sieberer U, et al. Risk and protective factors of health-related quality of life in children and adolescents: results of the longitudinal BELLA study. *PLoS One*. (2017) 12:e0190363. doi: 10.1371/journal.pone.0190363
27. Pinto RJ, Morgado D, Reis S, Monteiro R, Levendosky A, Jongenelen I. When social support is not enough: trauma and PTSD symptoms in a risk-sample of adolescents. *Child Abuse Neglect*. (2017) 72:110–9. doi: 10.1016/j.chiabu.2017.07.017
28. Pinto RJ, Correia-Santos P, Castro M, Jongenelen I, Levendosky A, Maia ÂC. Assessing reliability and validity of the child PTSD symptom scale in Portuguese adolescents. *Eur J Trauma Dissociation*. (2019) 3:263–9. doi: 10.1016/j.ejtd.2019.100127
29. Correia-Santos P, Morgado D, Maia ÂC, Levendosky A, Jongenelen I, Pinto RJ. Alternative models of DSM-5 posttraumatic stress disorder in Portuguese adolescents exposed to trauma and childhood adversity. *J Trauma Stress*. (2019) 32:908–17. doi: 10.1002/jts.22469
30. Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. *The Life Events Checklist for DSM-5 (LEC-5)*. Instrument available from the National Center for PTSD (2013).
31. Gray MJ, Litz BT, Hsu JL, Lombardo TW. Psychometric properties of the life events checklist. *Assessment*. (2004) 11:330–41. doi: 10.1177/1073191104269954
32. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*. (1998) 14:245–58. doi: 10.1016/S0749-3797(98)00017-8
33. Dube SR, Williamson DF, Thompson T, Felitti VJ, Anda RF. Assessing the reliability of retrospective reports of adverse childhood experiences among adult HMO members attending a primary care clinic. *Child Abuse Negl*. (2004) 28:729–37. doi: 10.1016/j.chiabu.2003.08.009
34. Gillihan SJ, Aderka IM, Conklin PH, Capaldi S, Foa EB. The child PTSD symptom scale: psychometric properties in female adolescent sexual assault survivors. *Psychol Assess*. (2013) 25:23–31. doi: 10.1037/a0029553
35. Foa EB, Asnaani A, Zang Y, Capaldi S, Yeh R. Psychometrics of the Child PTSD symptom scale for DSM-5 for trauma-exposed children and adolescents. *J Clin Child Adolesc Psychol*. (2018) 47:38–46. doi: 10.1080/15374416.2017.1350962
36. Derogatis LR. *BSI: Brief Symptom Inventory*. 3rd ed. Minneapolis, MN: National Computers Systems (1993).
37. Canavarro MC. Invent1rio de sintomas psicopatol3gicos: BSI [The brief symptom inventory: BSI]. In: Simões MR, Gon7alves M, Almeida LS, editors. *Testes e Provas Psicol3gicas em Portugal [Psychological tests in Portugal]*, Vol. II. Braga: SHO/APPORT (1999). p. 87-109.
38. Gaspar T, Ribeiro JL, Matos MG, Leal I, Ferreira A. Psychometric properties of a brief version of the Escala de Satisfação com o suporte social for children and adolescents. *Span J Psychol*. (2009) 12:360–72. doi: 10.1017/S113874160000175X
39. Ferreira PL, Baltazar CF, Cavalheiro L, Cabri J, Gonçalves RS. Reliability and validity of PedsQL for Portuguese children aged 5-7 and 8-12 years. *Health Qual Life Outcomes*. (2014) 12:122. doi: 10.1186/s12955-014-0122-3
40. Hayes AF. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. Guilford Publications. (2018).
41. McLaughlin KA. Future directions in childhood adversity and youth psychopathology. *J Clin Child Adolesc Psychol*. (2016) 45:361–82. doi: 10.1080/15374416.2015.1110823
42. Nolen-Hoeksema S, Watkins ER. A heuristic for developing transdiagnostic models of psychopathology: explaining multifinality and divergent trajectories. *Perspect Psychol Sci*. (2011) 6:589–609. doi: 10.1177/1745691611419672
43. Evans GW, Li D, Whipple SS. Cumulative risk and child development. *Psychol Bull*. (2013) 139:1342–96. doi: 10.1037/a0031808
44. O'Connor TG. The persisting effects of early experiences on psychological development. In: Cicchetti D, Cohen DJ, editors. *Developmental Psychopathology: Risk, Disorder, and Adaptation*. Hoboken, NJ: John Wiley and Sons, Inc. (2006). p. 202–34.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

SYSTEMATIC REVIEW
published: 22 October 2021
doi: 10.3389/fpsyt.2021.665957

Traumatic Events, Social Adversity and Discrimination as Risk Factors for Psychosis - An Umbrella Review

Leonie Varchmin[1], Christiane Montag[2], Yvonne Treusch[3], Jakob Kaminski[1†] and Andreas Heinz[1†]*

[1] Department of Psychiatry and Psychotherapy, Charité Universitätsmedizin Berlin, Charité Campus Mitte (CCM), Berlin, Germany, [2] Department of Psychiatry and Psychotherapy, University Clinic of the Charité in St. Hedwig Hospital, Charité Universitätsmedizin Berlin, Charité Campus Mitte (CCM), Berlin, Germany, [3] Hochschule Döpfer (HSD) Döpfer, University of Applied Science, Cologne, Germany

Exposure to childhood trauma is a well-known risk factor for severe mental disorders including schizophrenia and other non-affective psychoses. Beyond childhood trauma, there is increasing evidence that bullying, social exclusion, and discrimination during adolescence and adulthood may increase the risk of developing a psychotic disorder, and that such forms of traumatization may also underlie the elevated psychosis risk among migrants or persons with a visible minority status. In this umbrella review, we systematically assess meta-analyses regarding trauma and social adversity. A systematic literature review yielded 11 meta-analyses that met inclusion criteria and could be summarized quantitatively with a random effect model. Furthermore, six meta-analyses were evaluated qualitatively. Heterogeneity and publication bias were apparent in several meta-analyses. We observed that most significant social risk factors for psychosis were vulnerability for racist discrimination [OR = 3.90 (3.25–4.70)], migration [OR = 2.22 (1.75–2.80)], and childhood adversities [OR = 2.81 (2.03–3.83)]. Furthermore, social factors increasing the risk for psychosis were variation/impairment of parental communication, aversive adult life events, bullying, and factors associated with social isolation and discrimination. In spite of these environmental risk factors, there is a lack of evidence regarding treatment of trauma and psychosis, although some psychotherapeutic and art therapy approaches appear to be promising. Beyond individual interventions, stigmatization, racism, and other forms of discrimination need to be targeted to increase solidarity and communal support.

Keywords: umbrella review, meta-analysis, discrimination, racism, migration, trauma, schizophrenia, psychosis

OPEN ACCESS

Edited by:
Jutta Lindert, University of Applied Sciences Emden Leer, Germany

Reviewed by:
Susann Schmiedgen, Technische Universität Dresden, Germany
Maria Gloria Rossetti, University of Verona, Italy

****Correspondence:***
Andreas Heinz
andreas.heinz@charite.de

†These authors have contributed equally to this work

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *09 February 2021*
Accepted: *17 September 2021*
Published: *22 October 2021*

Citation:
Varchmin L, Montag C, Treusch Y, Kaminski J and Heinz A (2021) Traumatic Events, Social Adversity and Discrimination as Risk Factors for Psychosis - An Umbrella Review. Front. Psychiatry 12:665957. doi: 10.3389/fpsyt.2021.665957

INTRODUCTION

Schizophrenia is a serious mental disorder characterized by altered experience of the environment including hallucinations, self-disorders, delusions, and negative symptoms (1, 2). The WHO study suggested rather similar incidence rates worldwide, with incidence ranging between 0.1 and 0.4 per 1,000 individuals per year (3). The rather uniform psychosis risk in several countries and cultures may suggest that schizophrenia is a ubiquitous phenomenon, inherited in human nature, and indeed, a substantial genetic contribution to psychosis risk was confirmed (4). On the other hand, environmental risk factors play a significant role, as evinced by the strong increase in psychosis risk among certain populations of first- and second-generation migrants and refugees (5–9). Increased

psychosis risk among migrants and refugees is not simply explained by genetic factors, as there is no evidence for increased schizophrenia rates in the countries of origin (10). Instead, it has been observed that a low density of persons with a visible minority status in the neighborhood is associated with increased schizophrenia risk (6), suggesting that lack of social support and (racist or other forms of) discrimination contribute to psychosis risk (6, 8). As refugees display even higher rates of psychotic experiences than migrants without a refugee status (9), traumatization due to war experiences or during dangerous escapes and travels may contribute to vulnerability. In a recent umbrella review by Radua et al. (11) examining the strength of evidence for risk and protective factors (socio-demographic, parental, perinatal, later factors, or antecedents) for psychosis, strong evidence was found for ultra-high risk states [a state operationalized with varying diagnostic tools (12), in which psychotic experiences occur, however, not (yet) to the extent of a full blown psychotic episode] and for ethnic minority status, i.e., belonging to the so-called Black-Caribbean ethnicity in England.

Other forms of traumatization and stress exposure have also been implicated in the development of psychotic experiences. A series of studies show that childhood abuse is a prominent risk factor (13–18). In recent years, research related to those factors shifted its focus toward an approach that distinguishes between different types of childhood abuse (e.g., sexual vs. physical, emotional abuse, or neglect) and that considers the effects of trauma on specific psychotic experiences and their severity (16, 17). A meta-analysis of retrospective studies found prevalence rates of childhood sexual abuse of 26.3% (21.2–32.2), of childhood physical abuse of 38.8% (36.2–42.4), and of childhood emotional abuse of 34% (29.7–38.5) in patients with psychosis (19), highlighting the relevance of the possible link between trauma and psychosis. Stressful and potentially traumatizing experiences contributing to childhood adversity, furthermore, include bullying (18, 20), parental death (21), and alterations in parental communication (22, 23). Also, traumatic experiences during adulthood can contribute to psychosis risk (24), which may be explained by an explanatory framework that incorporates computational models on how our mind reacts on changing and potentially threatening environments including social exclusion and experiences of discrimination (8). In this context, a Bayesian framework suggests that prior knowledge about the world is always compared with sensory input; the difference between the estimated likelihood of an event (e.g., sensory input) and prior beliefs concerning such an event (expectation), each weighted by a certain precision, results in a so-called prediction error, which serves to update priors (25). In case of imprecise prior knowledge, prediction errors increase; as far as they are encoded by mesolimbic dopamine, elevated phasic dopamine release can increase the signal-to-noise ratio, although at the price of attributing salience to otherwise irrelevant stimuli, thus, linking a Bayesian account with dopamine dysfunction in schizophrenia (26, 27). We suggest that there are several reasons why prior knowledge may be challenged, thus, resulting in imprecise neurobiological encoding of priors (8). Specifically, imprecise encoding of prior knowledge may not only result from predominantly biological causes [e.g., anti-NMDA receptor antibodies in some psychotic states (28)], but also arise in complex situations characterized by threatening experiences and potentially uncontrollable social interactions as, e.g., experienced by previously traumatized or ethnically discriminated individuals (8, 29). Previous studies found varying prevalence rates between 0 and 55% of PTSD in patients suffering from schizophrenia spectrum disorders (30), suggesting a rather high prevalence of PTSD which may often remain overlooked in clinical settings (31). Further studies focused on the impact of urbanicity and poverty (32–35), poor medical care [particularly obstetric complications (36)], and drug use, particularly cannabis (37, 38).

In our umbrella review, we systematically research and summarize meta-analyses regarding trauma and related risk factors as identified by database screening and subsequent key word identification. We hypothesized that traumatic events in childhood and adulthood can trigger psychotic experiences (26), systematically reviewed the literature, focused on potentially traumatic experiences addressed in at least two previously published meta-analyses, and preregistered our respective hypotheses. We found three factors that fulfilled inclusion criteria and that were related to trauma, discrimination, and social adversity, migration, vulnerability for ethnic discrimination, and childhood trauma. We hypothesized to find variable heterogeneity depending on the examined factors. Our work thus extends a previous umbrella review by Radua et al. (11) by providing meta-analyses on three socially highly relevant and empirically well-replicated risk factors (discrimination, migration, and childhood traumatization), thus allowing a quantitative estimation of effect sizes and heterogeneity. Our umbrella review also includes more recently published meta-analyses on refugee status and psychosis (9), as well as migration and psychosis (8, 39). Where possible, we present a calculation of common effect sizes for a direct visualization of the heterogeneity. We address controversies regarding specific associations and discuss evidence regarding therapeutic interventions.

METHODS

For this study, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline (40). Methods of the analysis and inclusion criteria were specified in advance, documented, and pre-registered (41). Additionally, we followed the guideline by Fusar-Poli and Radua (42) that provides instructions for the production of umbrella reviews. For the purpose of this study, we refer to the definition of trauma from the ICD-10, where post-traumatic stress disorders arise "as a delayed response to a stressful event or situation (of either brief or long) duration of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone" (2). Accordingly, childhood trauma is a form of trauma that appears before the 18th birthday, that results from either emotional, physical, sexual abuse, or neglect, and that can be assessed by common interview measures such as the childhood trauma questionnaire (43). Childhood adversities

cover childhood trauma as well as other forms of potentially traumatizing events in childhood such as bullying, parental death, and alterations in parental communication. All risk factors examined are social environmental risk factors (in contrast to physical environmental risk factors) (44).

Eligibility Criteria

Types of Studies

We searched meta-analyses assessing trauma and related risk factors associated with the incidence of non-affective psychosis in different subgroups. Search terms were chosen on the basis of a first screening of the PubMed database with a restriction of year of publication between January 2018 and December 2020 using the following search terms on August 13, 2020:

Trauma psychosis

The screening yielded 513 original research articles that were all assessed *via* their abstract by author L.V. Among these articles, 59 original studies assessed the association of trauma and related risk factors for psychosis. The authors LV, JK, and AH identified trauma, racism, discrimination, and migration as the most relevant keywords regarding trauma and social adversity as environmental risk factors on the basis of mutual agreement. For the purpose of this study, keywords regarding genetic risk factors, other environmental non-traumatic risk factors (e.g., infections), or drug abuse were not regarded eligible as potential keywords.

The keyword list served as search terms for the second systematic search on PubMed conducted by L.V. No limits for language or publication date were applied, and unpublished material was excluded. The search was run on August 31, 2020. The date for the literature search reported in the preregistration was mistakenly stated to be August 31st, 2019. Please note that 2020 is the correct year. This systematic search applied the following search terms:

(Trauma OR Migration OR Discrimination OR Racism) AND (Psychosis OR non-affective psychosis OR schizophrenia OR first episode psychosis) AND meta-analysis

This database search yielded 139 records without duplicates, which were all screened *via* their abstract by LV. For the purpose of this study, we only selected meta-analyses (n = 18). According to a request of a reviewer, we performed a complementary database search based on the same search terms on Embase, PsychInfo, and Web of Science (restricted to results published until August 31, 2020 in accordance with our preregistered search).

Inclusion Criteria

In order to be considered for the meta-analysis, studies were required to (i) report a pooled risk ratio (RR, IRR, HR, or OR) with a 95% confidence interval; or (ii) an effect size that was presented in a way that could be converted to the common effect size of Cohen's d (e.g., Pearson's correlation coefficient r) of the incidence of positive or negative symptoms or diagnosed schizophrenia (SCZ), other non-affective psychotic disorders (NAPs), or first episode psychosis (FEP) according to standard operationalized criteria. All studies had to assess (iii) a risk factor described above (i.e., trauma, or related social adversity, or a history of migration, or minority status). Finally, all studies must have had a reference population (iv), and must have been published in a peer reviewed journal (v).

Exclusion Criteria

Studies were excluded when (i) the patient group involved individuals with a drug-related-psychosis, (ii) the pooled effect size was presented in a way that was not convertible to a common effect size, (iii) the article turned out to present original data only without a calculation of pooled effect sizes, thus, rather representing a systematic review instead of a meta-analysis. In addition (iv), and for reasons of parsimony, we also did not include meta-analyses and reviews that solely focus on the country of origin or destination of migration.

Quality Assessment

To the best of our knowledge, there are no consented measurement tools or guidelines for evaluating the quality of meta-analyses included in an umbrella review. Therefore, we adapted the AMSTAR- instrument established by Shea et al. (45), which was originally designed for assessing the methodological quality of systematic reviews.

Data Extraction Process

LV extracted the data and JK and AH checked the extracted data. Disagreements were resolved by discussion between the authors. Samples of the original meta-analyses used in this article had to be independent to ensure trustworthy results for a new pooled summary effect size. However, in several analyses, there was an overlap of original studies included into several meta-analyses that accounted for the same factor. In this case, the summary effect size calculated with more studies was preferred, while the other effect size was excluded.

Data Items

All pooled effect sizes and their confidence interval reported in the meta-analyses were recorded in the (**Supplementary Tables 1–3**), which includes information about the examined factor, possible adjustments (e.g., age, gender/sex, socioeconomic status, the diagnostic inclusion criteria [e.g., SCZ, NAP, FEP, psychotic disorder (PD)]), the number of studies (k) included for the calculation of the pooled effect, the number of cases (n1), controls (n2) and the p-value. The effect size values were converted to the common effect size "Cohen's d" as described below, and then also listed. If available, measures of heterogeneity such as Cochran's Q (46) and I^2- statistics (47) were reported. Additionally, we recorded indications for publication bias. If the information about publication bias was reported, the method for its estimate including visual inspection of the funnel plot, Egger's test (48), the Fail-Safe N test (49), the trim-and-fill-method (50), or the LFK index (51) are included.

Review and Meta-Analysis

The individual meta-analyses were grouped by similarity of factors or subgroups examined, respectively. The following factors could be identified as potential candidates for the calculation of a pooled common effect size: (I) psychosis

and childhood adversity—(Ia) childhood trauma (sexual abuse, physical abuse, emotional/psychological abuse, neglect), (Ib) bullying in childhood, (Ic) parental death, (Id) variations in parental communication, (Ie) psychosis and aversive adult life events (**Table 1**); (II) psychosis and migration—(IIa) first generation migrants vs. second generation migrants, (IIb) refugee status (**Table 2**), (IIIc) age at migration; (III) vulnerability for ethnic discrimination [proxied by minority status/skin-color (IIIa) and ethnic density effects (IIIb) (**Table 3**)]; (IV) psychosis and urbanicity (**Table 4**); (V) psychosis and obstetric complications. The calculation of a new summary common effect size was possible if (viii) more than one meta-analyses existed, and (ix) if the existing pooled effect sizes were convertible to Cohen's d. If the calculation of a common effect size was not possible, the factor was still qualitatively reviewed as for Id, Ie, IIb, IV, V. In addition to pooling of the factors mentioned above, one meta-analysis (VI) was conducted to assess moderating effects and compare the summary effect sizes of childhood-adversities (proxied by total childhood trauma) with those of migration (proxied by first and second generation migration) and minority status/vulnerability for ethnic discrimination (proxied by black skin color). We grouped social risk factors potentially associated with trauma and reported in the original meta-analyses into (1) childhood trauma, (2) migration, and (3) visible minority status that may increase vulnerability for racist discrimination. These groupings and labels represent our own classification based on previous meta-analysis and conceptual reviews (8, 26, 29, 30), and are based on the preregistered literature review with the above-mentioned inclusion and exclusion criteria, aiming at a fine-grained evaluation of social adversity.

Summary Measures

We followed the formulas provided by Fusar-Poli et al. (42), where the risk ratio (RR) can be obtained as a function of incidence rate ratio (IRR):

$$RR = \frac{average\ \left(time_{exposed}\right)}{average\ \left(time_{non-exposed}\right)} \times IRR$$

As incidences are small (42):

$$RR \approx IRR$$

The odds ratio (OR) can be obtained as a function of the risk ratio:

$$OR = \frac{1 - p_{non-exposed}}{1 - p_{exposed}} \times RR$$

As probabilities of developing the disease (p) are small (42):

$$OR \approx RR$$

Hence, we could assume as far as incidences are not too large that:

$$OR \approx RR \approx IRR$$

We converted OR, RR, and IRR to common effect size Cohen's d using the formula provided by Borenstein et al. (52):

$$d = \frac{\ln\left(OR; RR; IRR\right) \times \sqrt{3}}{\pi}$$

In case authors presented their results with the Pearson's correlation coefficient r, the conversion was possible with the help of the formula provided by Fusar-Poli et al. (42):

$$d = \frac{2r}{\sqrt{1 - r^2}}$$

In case authors presented their results with the help of the Hedge's g measure, we used the approximation by Fusar-Poli et al. (42), where for sample sizes that are large enough:

$$d \approx g$$

The common effect sizes could now be used to calculate a summary effect size for factors examined by more than one study. Finally, summary effect sizes could be reconverted to odds ratios to facilitate interpretation:

$$OR = e^{\frac{d*\pi}{\sqrt{3}}}$$

We used Harrer et al. (53) for the calculations of our summary effect sizes and the creation of our forest plot with the help of the statistics software RStudio (54). In detail, we used packages "tidyverse," "meta," "metafor," and "dmetar." We pooled effect sizes using a random effects model included in the "metagen"-function. Random effect models are preferred for studies consisting of differing populations (55) and therefore account also for the error resulting from distributional effects of true size effects. The function "metagen," applies the inverse variance method for weighing (56) and uses the "DerSimonian-Laird"-method (57) to obtain the between-study-variance estimator for τ^2, and the Jackson method for confidence interval of τ^2. The measurement of the output value is the standardized mean difference (SMD), which is identical to Cohen's d (58). Forest plots were generated with the function "meta::forest." The script and the excel sheet required to run it can be found on Github (see data availability statement).

We used Cohen's d, which facilitates the comparison with the effects of different studies independent of the original way of their measurements (59). A commonly used interpretation categorizes effect sizes |d| <0.2 as small, |d| <0.5 as medium and |d| <0.8 as large (60).

Heterogeneity

Heterogeneity was assessed using Q statistics (46). The computation of the I^2 -index (47) represents the percentage of variance caused by heterogeneity (61): I^2 values close to 0% indicate that heterogeneity is primarily due to sampling error within the studies, I^2 values <25% represent low, <50% moderate, <75% high, and >75% substantial heterogeneity due to between-study variability (e.g., method used, sample population) (47).

TABLE 1 | Childhood trauma, other childhood adversities, adult life events, and psychosis risk.

Factor/study	Diagnosis	k1	k2	Summary statistical value^{+} or common size effect^{++} and variance	I^2	Q
Childhood trauma						
Total	PD, PS	2		***d* = 0.57 (0.39–0.74)**	0	0.11^{ns}
Specific trauma type						
Sexual abuse	SCZ, Dis, PD, PS	2		***d* = 0.50 (0.39–0.62)**	10.0	1.11*
Physical abuse	SCZ, Dis, PD, PS	2		***d* = 0.63 (0.51–0.74)**	0	0.49 ^{ns}
Emotional abuse	SCZ, Dis, PD, PS	2		***d* = 0.77 (0.53–1.01)**	11.6	1.13*
Neglect	SCZ, Dis, PD, PS	2		***d* = 0.47 (0.34–0.60)**	0	0.76 ^{ns}
Other childhood adversities						
Bullying in childhood	PD, PS	2		***d* = 0.49 (0.37–0.62)**	0	0.16 ^{ns}
Parental death	PD, PS	2		***d* = 0.12 (0.04–0.21)**	0	0.71 ^{ns}
Variations in parental communication De Sousa et al.	PD		19	*d* = 0.97 (0.76–1.18)	46.5	33.4****
Adult life events						
Beards et al.	PD, PE		13	*D* = 0.64 (0.42–0.86)	87.3	

*Summary effects and qualitative review of included 1meta-analyses. PD, psychotic disorder; SCZ, schizophrenia; PE, psychotic experiences; PS, psychotic symptoms; Dis, dissociation; k1, number of meta-analysis for summary effect size; k2, number of effect sizes included in study; d, Cohen's d; $^{+}$pooled result of several meta-analyses written in bold letters; $^{++}$one meta-analysis available, result converted in common effect size and presented qualitatively; Q, Cochran's Q heterogeneity statistics; I^2, I^2 index for heterogeneity. *p < 0.3; **p < 0.05; ***p < 0.01; ****p < 0.001; ^{ns}, not significant.*

TABLE 2 | First- and second-generation migrants, refugee status, and psychosis risk.

Study	Diagnosis	K	n1	n2	Statistical value and variance	Summary statistical value^{+} or common size effect^{++} and variance	I^2	Q
First- and second-generation migrants, high-quality studies								
Selten et al.	NAP	15	4,896	18,040	RR = 2.15 (1.95–2.37)*	*d* = 0.42 (0.37–0.48)	94.7	
Henssler et al.	NAP	25			RR = 1.81 (1.62–2.02)	*d* = 0.33 (0.27 −0.39)	97.6	
Cantor-Gr et al.	SCZ	50	3,092	27,130	RR = 2.90 (2.50–3.40)	*d* = 0.59 (0.51–0.68)		68.3**
Total						***d* = 0.44 (0.11–0.77)**	91.8	24.5***
First-generation migrants								
Selten et al.	PD	29	14,351	84,701	RR = 2.55 (2.31–2.82)	*d* = 0.52 (0.46–0.57)	97.9	
Henssler et al.	NAP	20			RR = 1.81 (1.59–2.07)	*d* = 0.33 (0.26–0.40)	97.6	
Cantor-Gr. et al.	SCZ	40	2,846	26,785	RR = 2.7 (2.3–3.2)	*d* = 0.55 (0.46–0.64)		55.4**
Bourque et al.	PD	61	5,556	33,160	IRR = 2.3 (2.0–2.7)	*d* = 0.46 (0.38–0.55)	94.4	1071.0***
Total						***d* = 0.46 (0.37–0.56)**	85.2	20.3***
Second-generation migrants								
Selten et al.	PD	13			RR = 1.78 (1.66–1.90)***	*d* = 0.32 (0.28–0.35)	94.2	
Henssler et al.	NAP	13			RR = 1.82 (1.66–1.99)	*d* = 0.33 (0.28–0.38)	90.5	
Cantor-Gr. et al.	SCZ	7	474	8,895	RR = 4.5 (1.5–13.1)	*d* = 0.82 (0.22–1.42)	4.5	55.4
Bourque et al.	PD	28	4,515	24,360	IRR = 2.1 (1.8–2.5)	*d* = 0.41 (0.32–0.51)	91.1	303.0***
Total						***d* = 0.34 (0.29–0.40)**	53.4	6.4*
Refugees								
Brandt et al.	NAP	10			RR = 2.52 (1.78–3.57)****	*d* = 0.51 (0.32–0.70)	98.0	
Selten et al.	NAP	4			RR = 1.88 (1.57–2.24)	*D* = 0.35 (0.25–0.45)	91.4	
Total						***D* = 0.41 (0.25–0.56)**	54.6	2.20*

*Summary effects and qualitative review of included meta-analyses. PD, psychotic disorder; NAP, non-affective psychosis; SCZ, schizophrenia. K, number of effect sizes; n1, number of cases; n2, number of controls RR, risk ratio; IRR, incidence rate ratio; d, Cohen's d; $^{+}$pooled result of several meta-analyses written in bold letters; $^{++}$one meta-analysis available, result converted in common effect size and presented qualitatively; Q, Cochran's Q heterogeneity statistics; I^2, I^2 index for heterogeneity. *p < 0.3; **p < 0.05; ***p < 0.01; ****p < 0.001.*

TABLE 3 | Vulnerability for racist discrimination and psychosis risk.

Study	F/S	Dia-gnosis	k	n1	n2	Statistical value and variance	Summary statistical value^{+} or common size effect^{++} and variance	I^2	Q
Skin color white									
Selten et al.	F + S	NAP	19			RR = 1.65 (1.46–1.85)	*d* = 0.27 (0.21–0.34)	97.1	
Cantor-Gr. et al.	F + S	SCZ	16	799	1,5902	RR = 2.3 (1.8–3.0)	*d* = 0.46 (0.32–0.61)		
Borque et al.	F	PD	19	1,808	20,853	IRR = 1.8 (1.6–2.1)	*d* = 0.33 (0.26–0.41)	89.7	175.4***
Borque et al.	F	PD	4	243	5,566	IRR = 1.9 (1.2–3.0)	*d* = 0.35 (0.10–0.61)	87.2	23.5***
Total							***d* = 0.34 (0.26–0.41)**	51.5	6.18*
Skin color black									
Selten et al.	F + S	NAP	23			RR = 4.19 (3.42–5.14)****	*d* = 0.79 (0.68–0.90)	94.3	
Cantor-Gr. et al.	F + S	SCZ	16	896	24,931	RR = 4.8 (3.7–6.2)	*d* = 0.86 (0.72–1.01)		
Olbert et al.	BI	SCZ	52	863,293	2,532,655	OR = 2.42 (1.59–3.66)****	*d* = 0.49 (0.25–0.71)	98.3	
Borque et al.	F	PD	18	1,711	25,255	IRR = 4.0 (3.4–4.6)	*d* = 0.76 (0.67–0.84)	79	80.8***
Borque et al.	F	PD	7	127	279	IRR = 5.4 (3.2–8.8)	*d* = 0.92 (0.64–1.19)	78.9	28.4***
Total							***d* = 0.77 (0.67–0.87)**	54.8	8.85*
Skin color other									
Selten et al.	F + S	NAP	11			RR = 1.73 (1.41–2.14)	*d* = 0.30 (0.18–0.42)	95.1	
Cantor-Gr. et al.	F + S	SCZ	11	649	13,782	RR = 2.2 (1.6–3.0)	*d* = 0.43 (0.26–0.61)		
Borque et al.	F	PD	16	505	14,765	IRR = 2.0 (1.6–2.5)	*d* = 0.38 (0.26–0.51)	84.7	97.8***
Borque et al.	F	PD	5	51	8,843	IRR = 2.0 (1.0–4.0)	*d* = 0.38 (0.00–0.76)	73.8	15.3***
Total							***d* = 0.36 (0.28–0.43)**	0	1.7^{ns}
Ethnic density									
High									
Bosqoui et al.		PD	5			IRR = 2.52 (1.28–5.32)	*d* = 0.51 (0.14–0.92)	0	
Low									
Bosqoui et al.		PD	5			IRR = 4.51 (2.25–8.58)	*d* = 0.83 (0.45–1.19)	0	

*Summary effects and qualitative review of included meta-analyses. F, first-generation migrant; S, second-generation migrant; BI, black individuals; PD, psychotic disorder; NAP, non-affective psychosis. SCZ, schizophrenia; k, number of effect sizes; n1, number of cases; n2, number of controls; OR, odds ratio; RR, risk ratio; IRR, incidence rate ratio; d, Cohen's d; $^{+}$pooled result of several meta-analyses written in bold letters; $^{++}$one meta-analysis available, result converted in common effect size and presented qualitatively; Q, Cochran's Q heterogeneity statistics; I^2, I^2 index for heterogeneity. *p < 0.3; **p < 0.05; ***p < 0.01;****p < 0.001; ^{ns}, not significant.*

TABLE 4 | Urbanicity and psychosis risk.

Study	Dia-gnosis	k	n1	n2	Statistical value and variance	Summary statistical value^{+} or common size effect^{++} and variance	I^2	Q
Urbanicity								
Kirkbride et al.	NAP	9			IRR = 1.02 (1.02–1.03)***	*d* = 0.01 (0.01–0.02)		
Kirkbride et al.	SCZ	15			IRR = 1.03 (1.01–1.03)***	*d* = 0.02 (0.01–0.02)		
Castillejos et el.	NAP	5			IRR = 2.25 (2.00–2.52)****	*d* = 0.45 (0.38–0.51)		
Castillejos et el.	SCZ	3			IRR = 1.64 (1.38–1.95)***	*d* = 0.27 (0.18−0.37)		
Total						***d* = 0.57 (0.39−0.74)**	98.5	206.71***

*Summary effects and qualitative review of included meta-analyses. NAP, non-affective psychosis; SCZ, schizophrenia; k, number of effect sizes; n1, number of cases; n2, number of controls; IRR, incidence rate ratio; d, Cohen's d; $^{+}$pooled result of several meta-analyses written in bold letters; $^{++}$one meta-analysis available, result converted in common effect size and presented qualitatively; Q, Cochran's Q heterogeneity statistics; I^2, I^2 index for heterogeneity. *p < 0.3; **p < 0.05; ***p < 0.01; ****p < 0.001; ^{ns}, not significant.*

Biases

The possibility of publication bias, can be assessed for with the help of the Egger's test (48). However, applying this method is only appropriate when the numbers of effect sizes within the meta-analysis is >10 (62). Instead, we created a funnel plot and performed the Eggers' test (supplements) assessing all effect sizes used in this umbrella review ($k = 38$). It may serve as a rough assessment for overall-publication bias.

Sensitivity Analysis

Confounding factors (gender/sex, age, socioeconomic status) were in some meta-analyses adjusted for. The extracted values can be found in the (**Supplementary Material Tables 1–3**).

RESULTS

Study Characteristics

The flowchart in **Figure 1** visualizes the search strategy for this study. The initially found 139 citations were reduced to 18 full-texts-assessed meta-analyses after application of the inclusion criteria. This number reduced further to 15 studies that could be included in the current umbrella review. The studies from Matheson et al. (63), Bonoldi et al. (19), and Nielssen et al. (64) had to be excluded due to the criteria mentioned above. The complementary search on Embase, PsychInfo, and Web of Science led to the inclusion of two other meta-analyses from Castillejos et al. (65) and Brandt et al. (9).

Quality of the Studies

A result of the AMSTAR-rating of 1–4 was considered low, 5–7 medium, and 8–11 of high quality, respectively. All included meta-analyses could be ranked as high quality except for Olbert et al. (66), Cannon et al. (45) and Castillejos et al. (65), which were estimated to be of medium quality. The meta-analysis of Bosqui et al. (6) made use of uncommon methods for weighting of the original studies, as the inverse of the quality score was used as a weighting factor for the calculation of summary effect sizes. However, our scoring still ranked this meta-analysis to be of high quality. Varese et al. (67) stated in their supplements that a quality rating for included original studies was not applicable, other authors (8) accounted for quality issues by reporting additional effect sizes that excluded papers with high risk of bias, which could, nevertheless, not be accounted for in the AMSTAR index. A table including the quality rating can be found in the (**Supplementary Tables 1–3**).

We were able to include effect sizes of 11 of the studies into one or more quantitative syntheses in form of meta-analyses (5, 8, 39, 66–70). Six further studies reported risk-factors that were exclusively described only in their study. As the calculation of a summary effect size requires at least two effect sizes from different meta-analyses, these studies could only be evaluated qualitatively (6, 16, 24, 36, 71–73).

Data for analysis were obtained from five articles for childhood adversities [Bailey et al. (16), de Sousa et al. (71); Pastore et al. (69); Rafiq et al. (70); Varese et al. (67)] covering the risk factors total childhood trauma, specific trauma types (sexual abuse, physical abuse, emotional abuse, neglect) and other childhood adversities as (bullying in childhood, parental death, and variations/impairments in parental communication). Some studies assessed the relation between certain psychotic symptoms (hallucination, delusions, dissociation, or positive and negative psychotic symptoms) (16, 70) and different kinds of trauma. Beards et al. (24) examined the association of psychosis to aversive adult life events. Data provided by Cannon et al. (36) covering obstetric complications were very detailed and can be found in the **Supplementary Table 4**.

Regarding migration, there are seven suitable meta-analyses that address different points [Anderson and Edwards (73), Bourque et al. (68), Cantor-Graae and Selten (5), Henssler et al. (8), Selten et al. (39), Castillejos et al. (65), Brandt et al. (9)]. They could be grouped according to whether they assessed differences in first and second generation migrants (5, 8, 39, 65, 68), a refugee status (9, 39) and effects associated to the age at migration (73).

Five studies examined the association of vulnerability for psychosis associated with ethnic discrimination proxied by skin color and ethnic density [Selten et al. (39), Cantor-Graae and Selten (5), Bourque et al. (68), Olbert et al. (66), Bosqui et al. (6)]. Two studies examined the relation between urbanicity and psychosis [Kirkbride et al. (72), Castillejos et al. (65)].

Quantitative and Qualitative Analysis

For the overall comparison (VI) between the summary effects, the following studies could be included for vulnerability for ethnic discrimination (5, 39, 66, 68), for childhood adversity (67, 69) and for migration (5, 8, 39), respectively. The Q-value for between group differences was significant $Q = 13.77$ ($p = 0.001$) for the overall comparison between the summary effects of (1) vulnerability for ethnic discrimination, (2) childhood trauma, and (3) migration, respectively. This means that the effects of vulnerability to discrimination, childhood trauma, and migration differ in their size concerning the risk for psychotic experiences: The pooled effect of vulnerability for ethnic discrimination was of medium size with high heterogeneity [$k = 5$; $d = 0.77$ (0.65–0.86); $p < 0.001$; $I^2 = 61.3\%$; $Q = 7.74$; $\tau^2 = 0.75$]. Heterogeneity in this context means that the results of the underlying meta-analyses vary highly. The summary size effect of childhood adversities also showed a medium effect size with low heterogeneity [$k = 2$; $d = 0.57$ (0.39–0.74); $p < 0.001$ $I^2 = 0\%$; $Q = 0.11$; $\tau^2 = 0$]. The summary size effect of risk factors related to migration was small with substantial heterogeneity [$k = 2$; $d = 0.44$ (0.31–0.57); $p < 0.001$; $I^2 = 91.8\%$; $Q = 24.46$, $\tau^2 = 0.0123$]. Reconversion of these values to facilitate interpretation yielded to OR = 3.90 (3.25–4.76), OR = 2.81 (2.03–3.83) and OR = 2.22 (1.75–2.81), respectively (**Figure 2**).

Childhood Adversities

Adjusted data for total childhood trauma did not differ much to the pooled effect (**Supplementary Table 1A**) with overlapping confidence intervals. Regarding specific symptoms, Bailey et al. (16) identified an association between childhood trauma and the severity of hallucinations and delusion, but not with the severity of negative symptoms (**Supplementary Table 1A**). Focusing on specific types of childhood trauma, emotional abuse displayed strongest associations to psychosis, followed by physical abuse, sexual abuse, and neglect (Ia) (**Table 1**). Bullying in childhood (IIb) as a type of childhood adversity resulted in a summary size effect of $k = 2$, $d = 0.49$ (0.37–0.62) which is slightly below the other forms of childhood traumatization, although with an overlapping confidence interval. Possible effects of parental death (Ic) displayed weaker summary effect sizes [$k = 2$; $d = 0.12$ (0.04–0.21)]. Variations/impairments in parental communication (Id) was examined only by one study (71) that identified very high effect sizes (**Table 1**) with medium heterogeneity. Aversive adult

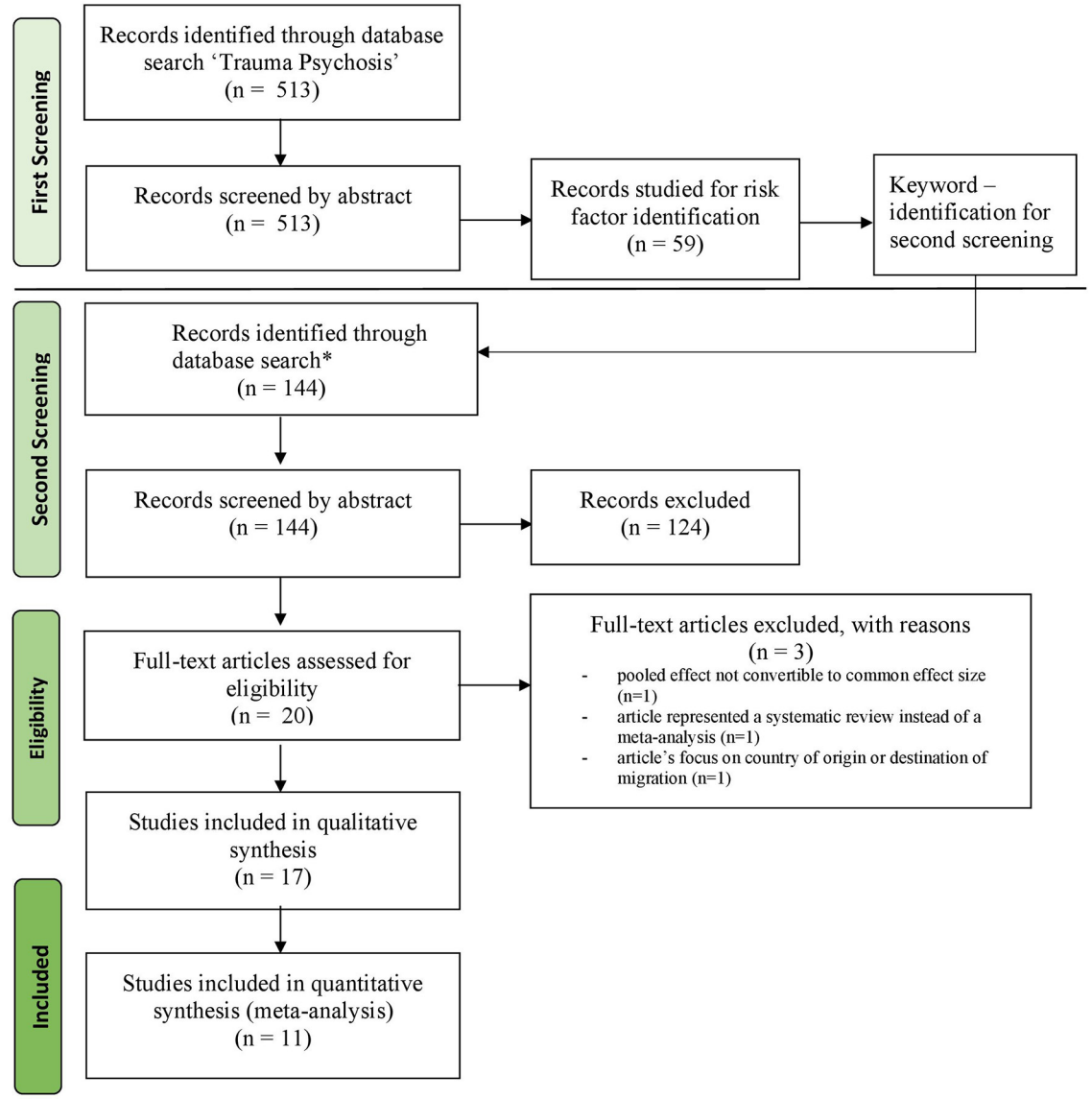

FIGURE 1 | Flow diagram to summarize selection process, adapted from (40).

life events (Ie) were only assessed in one meta-analysis (24) that reported medium to high effect sizes of $d = 0.64$ (0.43–0.86) with high heterogeneity of $I^2 = 87.3\%$.

Migration

The pooled effect size of studies assessing the risk for first-generation migrants was higher than for those assessing for both generations, and those assessing for second-generation migrants only (IIa) (**Table 2**), but all confidence intervals overlapped and can be ranked as medium (60). Data with a high-quality rating were preferred in this analysis. The medium quality study displayed slightly higher effect sizes for risk and second generation migrants compared with high quality studies (**Supplementary Table 2**). The summary effect size for

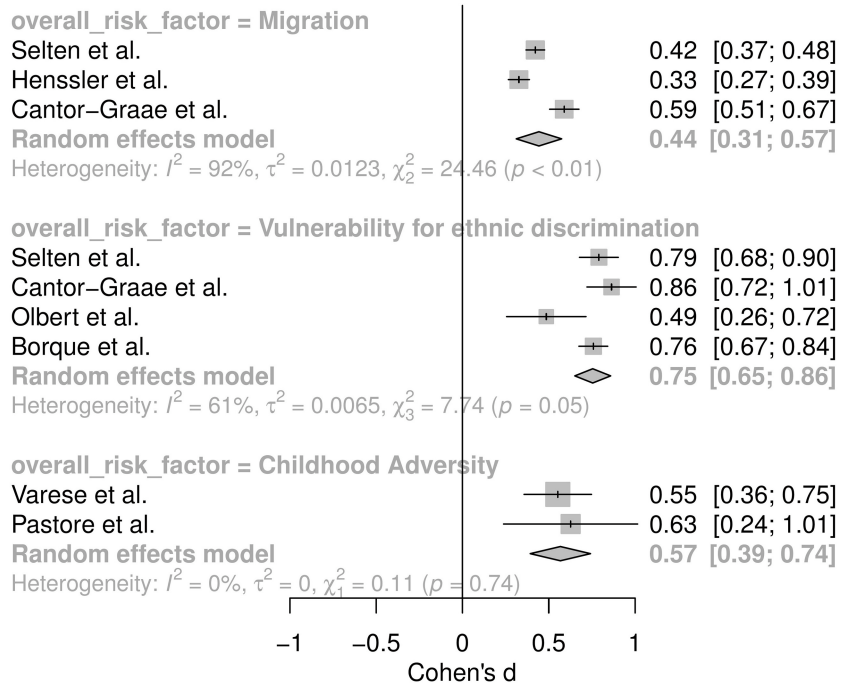

FIGURE 2 | Meta-analysis comparing the summary effect sizes for migration, vulnerability for ethnic discrimination, and childhood adversity, respectively.

a refugee status was medium (IIb) (**Table 2**). Adjusted data for confounders age, sex/gender, and socioeconomic status displayed slightly lower effect sizes (**Supplementary Table 2**).

One study examined the effect of age of migration and the risk of psychosis (73), and found highest incidences among migrants aged 0–2 and 3–6 years when migrating, while incidences were comparable with the native age group for migrants who migrated at the age of 19–29 years (IIc) (**Supplementary Table 2**).

Vulnerability for Ethnic Discrimination

The association between vulnerability for racist discrimination and the risk of psychosis was strongest for migrants living in areas of low ethnic density (IIIb) [effect from one meta-analysis (6)]; $d = 0.83$ (0.45–1.19), and for individuals with minority status and a black skin color (IIIa) {summary effect [$k = 5$; $d = 0.77$ (0.67–0.87)]} (**Table 3**).

Urbanicity and the link to NAP and SCZ yielded in a large summary effect size (IV) (**Table 4**). Obstetric complications displayed varying effect sizes (V) but are only included in the supplement (**Supplementary Table 4**) due to quality issues and the extent of the study: diabetes in pregnancy showed highest impact of all risk factors examined [$d = 1.12$ (0.17–2.09)], followed by placental abruption, birth weight <2,000 g, emergency cesarean section, and congenital malformations.

Heterogeneity

Heterogeneity values of original meta-analyses was low ($I^2 <$ 25%), medium ($I^2 <$ 50%), high ($I^2 <$ 75%), and substantial ($I^2 >$ 75%), respectively, for the following reported effect sizes in this study: low for total childhood trauma, sexual abuse, sexual abuse and severity of hallucinations, physical abuse, emotional abuse, neglect, neglect and severity of hallucinations, and severity of delusions, emotional and physical neglect and dissociation, bullying in childhood, parental death, minority position skin color, other high and low ethnic density; medium for childhood trauma and severity of hallucinations, childhood trauma and severity of delusions, and positive psychotic symptoms, sexual abuse and severity of delusions and positive psychotic symptoms, variations in parental communication; high for childhood trauma and dissociation and severity of negative psychotic symptoms, sexual abuse and severity of negative and positive psychotic symptoms, neglect and severity of negative psychotic symptoms, second-generation migrants, refugee status, age at migration (36, 7–12 years), majority position skin color white, minority position skin color black; and substantial for aversive adult life events, first- and second-generation migrants (high quality studies), urbanicity, first-generation migrants only, age at migration (0–2, 13–18, 19–29 years), all migration studies that adjusted for confounders (age, sex/gender/socioeconomic status). Values of heterogeneity were not available for childhood trauma studies that adjusted for confounders, first and second generation migrants (medium quality studies), and data on obstetric complications (**Supplementary Tables 1–3**).

Publication Bias

Within the data extracted for this study, there was slight evidence for publication bias in the article of Rafiq et al. (70)

regarding childhood trauma and the risk for schizophrenia, of Pastore et al. (69) regarding childhood trauma and the risk for psychotic disorder, of Anderson et al. (73) regarding age at migration and the risk for psychotic disorder, of Olbert et al. (66) regarding black individuals and diagnosis of schizophrenia, and of De Sousa et al. (71) regarding variation in parental communication and the risk of psychotic disorder. In addition, there was considerable publication bias within data of Bailey et al. (16) regarding childhood trauma and severity of hallucinations (**Supplementary Table 1A**). The funnel plot created for the purpose of this study displayed some asymmetry and the Egger's test was significant ($p = 0.007$) suggesting publication bias (see **Supplements**).

DISCUSSION

The main findings of our umbrella review confirm the substantial increase in the risk to develop non-affective psychosis when exposed to trauma or discrimination. In fact, the strongest increase in this risk was associated with vulnerability for ethnic discrimination proxied by visible minority status (with high heterogeneity), while numerically lower effects were found for childhood adversities (with low heterogeneity) and migration (with substantial heterogeneity). In further analysis including all poolable and non-poolable effect sizes, most substantial effects were observed for exposure to variation/impairment of parental communication, small size of the local ethnic group of a member of that group (low ethnic density), black skin color, and emotional abuse, followed by aversive adult life events, physical abuse, urbanicity (with substantial heterogeneity), sexual abuse, bullying, neglect, refugee status and further factors associated with social isolation and discrimination, including an extraordinarily high ethnic density that may indicate social separation and marginalization. A low but still significant effect was found for parental death. Is it plausible that such diverse factors all contribute to the manifestation of schizophrenia and related psychotic disorders? A computational approach of psychotic disorders suggests that imprecise prior knowledge biases information processing toward sensory input, thus increasing errors of prediction and, hence, volatility of the representation of the environment (27, 74). We and others have suggested that imprecision of prior knowledge may be caused by both primarily biological (e.g., inflammation impairing neural information processing) as well as social factors, the latter including cultural differences and experiences of traumatization and discrimination (27). In this perspective, traumatization or discrimination may induce existential anxiety and evoke feelings of being threatened, not only in outright dangerous but already ambivalent or ambiguous social contexts (75). In such contexts, stress exposure can stimulate phasic dopamine release, which reduces all too complex or chaotic environmental input by attributing salience to certain environmental cues, thus increasing the signal to noise ratio (26, 75). However, salience may then also be attributed to otherwise irrelevant stimuli, which contributes to delusional mood and delusion (76). Finally, delusion formation, associated with higher order processing, may help to further reduce complexity and information overflow, however, at the expense of flexible belief adaptations (26, 27). Altogether, experiences of trauma, discrimination, and social exclusion can challenge prior knowledge and trust in social interactions, thus promoting a focus on environmental input, particularly when a person feels threatened, which stimulates a cascade of (partly compensatory) alterations in information processing that result in key symptoms of psychosis. While this model provides a plausible path to psychosis, it has to be emphasized that stress is known to have differing neuroplastic effects depending on age (77), so traumatizing and aversive events may have rather specific neurobiological effects in the development and clinical course of psychosis. Our findings are not suggestive to assume that either adult or childhood trauma exposure have a greater impact on the development of psychosis. Nevertheless, the here examined risk factors can be very aversive or are directly traumatic (2) and therefore, suggest that therapy of trauma should more regularly be available for persons with psychotic experiences.

These findings indicate a dire need for the therapy of trauma among persons with psychotic experiences. However, there is a substantial lack of evidence. As far as psychotherapeutic approaches are concerned, treatment of trauma and specifically post-traumatic stress disorder (PTSD) is based on a robust body of evidence favoring trauma-focused interventions that include exposure and/or cognitive restructuring as a central component (78–80). Trauma focused cognitive behavioral therapy (CBT), Prolonged Exposure (PE), Cognitive Processing Therapy (CPT), Eye Movement Desensitization and Reprocessing (EMDR), Brief Eclectic Psychotherapy (BEP), Narrative Exposure Therapy (NET), and written narrative exposure are therefore recommended by the national and international guidelines (81). Trauma-focused psychological therapies like EMDR and NET have been shown to be effective in improving symptoms for refugees and asylum seekers with PTSD (82). Compared with single-event PTSD, multicomponent and more flexible interventions were recommended for patients exposed to complex, war-related or childhood-onset trauma, who also suffer from disturbances of self-organization like emotional dysregulation (80, 83). However, evidence is less compelling regarding the treatment of PTBS in the presence of comorbid mental disorders, especially psychoses, as these usually represent exclusion criteria (84). Similarly, many studies support the efficacy of psychotherapies like CBT and family interventions in psychotic disorders (85–88), but evidence from randomized-controlled research on psychological interventions for PTSD in patients with severe mental illness is still scarce. A recent Cochrane review and meta-analysis identified only four eligible trials (89). In a seminal study, van den Berg et al. compared EMDR, PE, and a waiting group in ($n = 155$) patients with a lifetime diagnosis of psychosis or mood disorder with psychotic features. Patients who received one of the active therapies achieved greater reductions of PTSD symptoms and significantly more often lost PTSD diagnosis than those in the waiting list group. Results were stable at 6–12 months of follow-up (90). Mueser et al. compared two RCTs of mixed patient groups with severe mental disorders 16 sessions of a CBT for PTSD program

with standard or brief treatments and reported small to medium improvements of PTSD symptoms in the intervention groups at 6 months (91, 92). A study focusing patients with schizophrenia and exhibiting post-traumatic stress symptoms ($n = 61$) found no effect of a 16-session cognitive restructuring intervention compared with standard care (93). In another smaller study ($n = 50$) patients with schizophrenia, bipolar or not otherwise specified psychoses with a documented history of childhood trauma were administered either 10 group sessions of Acceptance and Commitment Therapy (ACT) or treatment as usual. Results indicated improvements in brief psychiatric rating scale (BPRS), anxiety, and emotional acceptance, but not in trauma-related symptoms in the ACT sample (94). However, in contrast to previous concerns of worsening psychotic symptoms by exposure to trauma-associated material (95), no adverse events were reported by any RCT and controlled safety studies (95, 96). Meanwhile, a number of theoretical approaches target the risk of developing psychosis conferred by interpersonal trauma or aim at the treatment of comorbid post-traumatic symptoms (97–99). Moreover, mentalization-based psychotherapy was shown to improve functional outcome in psychotic patients (100) and may, like other psychodynamic approaches focusing reflective functioning, attachment, and interpersonal regulation (101–103) be complemented by trauma-specific treatment components, at least in integrative and team-based settings.

Adjunctive non-psychotherapeutic approaches could address both trauma and psychotic experiences but remain poorly researched. As a lack of social support and discrimination as well as social exclusion (6, 8) contribute to psychosis and traumatization, therapeutic group-sessions may support a sense of belonging for these patients. When direct verbal interaction becomes difficult, non-verbal treatment strategies such as occupational or art therapies have a long-standing role in facilitating engagement and affiliation (104).

Creative therapies are recommended as therapeutic offers for all patients with psychosis or schizophrenia by the National Institute for Health and Clinical Excellence (105) (NICE) and may be specifically useful for the alleviation of negative symptoms. Regarding their effectiveness, there is inconclusive evidence for the treatment of psychosis: in a recent meta-analysis, Law and Convey (106) investigated the effects of different kinds of art therapy (arts, music, dance, and body-orientated psychotherapy), by analyzing nine RCTs. They concluded that in contrast to the NICE endorsement, there is a lack of evidence for any reduction in total or positive symptoms of schizophrenia. Significant reductions of negative symptoms in favor of art therapy provided in groups have been reported, but this effect was not stable in trials using blind assessment of outcomes only. A previous review conducted by (104) included qualitative and quantitative research methods focusing on art therapy (not including dance, music or other approaches) for persons with psychotic disorders. They analyzed two high quality RCTs (107–109) and other quantitative studies with conflicting results. Five high-quality qualitative articles suggested that clients and therapists considered art therapy as beneficial and meaningful (104).

As language and cultural differences can present challenges in the treatment of traumatized adults, art therapies may also be helpful to facilitate communication and support social contact and engagement. Due to a weak evidence base (few studies with methodological limitations, heterogeneity of studies), there are so far no recommendations for non-verbal approaches in psychiatric guidelines for the treatment of persons with trauma (including the APA guideline, 2017 for the treatment of PTSD in adults, or the NICE guideline, 2018 for PTSD). As a lacking sense of belonging seems to play an important role within the formation of traumatization, NICE guidelines [2018] recommend peer groups, which should be instructed by therapeutic professionals. Art may facilitate such groups as a treatment option in a non-pathologizing manner. Schouten et al. (110) reported some evidence that art therapy interventions are effective in reducing trauma symptom severity and anxiety: three out of six controlled studies included in their systematic review reported a significant decrease of depression in individuals with PTSD. In a more recent systematic review Baker et al. (111) also included music and drama therapy but found low to very low evidence for each therapy form.

Altogether, to improve treatment options for individuals with psychosis and traumatization, future research could focus on individual experiences and assess outcome measurements including social functioning, well-being, mentalization, and self-efficacy (104).

Strengths and Limitations

The robustness of umbrella reviews depends on the robustness and comparability of underlying meta-analyses, which themselves depend on the robustness and comparability of original studies. Our umbrella review suggests that risk factors including overall childhood trauma are influenced by publication bias of various degrees, and summary effect sizes might therefore be overestimated. High and substantial heterogeneity was found within most risk factors in the field of migration and vulnerability for ethnic discrimination proxied by skin-color. This study examined both diagnosed traumatic events and potentially traumatizing events. This heterogeneity of potentially traumatizing factors may limit the generalization of our findings; however, it emphasizes the relevance of severely aversive events that could potentially be prevented by targeted interventions. Based on the reviewed meta-analyses, we grouped social risk factors potentially associated with trauma. This umbrella review is limited by the fact that the examined constructs, childhood adversities' "vulnerability for ethnic discrimination and migration" are based on our own classification of the literature; however, previous work on migration (8, 39), evidence from longitudinal and retrospective studies for vulnerability for ethnic discrimination (68, 112), and studies on childhood trauma (16, 67), including a possible dose response relation, suggest that these are highly relevant factors. A limitation of our approach is that pathways to psychosis, thus, addressed may vary considerably, because neurobiological correlates of trauma differ considerably between childhood and adulthood (77). Also, we do not address other potentially relevant traumatic experiences during adulthood independent of migration and minority status due to a lack of meta-analyses: we only found one meta-analysis of Beards et al. who examined adult life events and grouped these

potentially traumatizing events in adulthood together (24). Further research should also reassess the influence of regional characteristics that might influence the effect. Furthermore, heterogeneity can also be caused by diagnostic or sample bias, as studies including patients with schizophrenia only were pooled together with a result from samples including a broader definition of non-affective psychotic disorders or patient groups that included psychotic experiences or psychotic symptoms. Although we did our best to avoid overlap reporting by excluding certain summary effect sizes to ensure independent underlying samples for a new pooled summary effect size, we cannot be fully certain that all overlaps could be identified correctly. We, thus, applied a random effect model for the calculation of summary effect sizes assuming a distribution of true summary effect sizes accounting for each sample, respectively.

Finally, a quantitative assessment of confounders was not possible in this study due to limited data. Results of individual meta-analyses suggest that age, sex/gender, and socioeconomic status confound the data for first- and second-generation migration (**Supplementary Table 2**), and lower values would be found after an adjustment.

CONCLUSIONS

Our umbrella review strongly suggests that in addition to childhood trauma, social exclusion, racist discrimination based on skin color and minority status, as well as other forms of adult traumatization and adversity substantially contribute to the risk of psychosis. In spite of these rather strong effect sizes, there is only limited evidence for interventions using psychotherapy, art therapy, or other non-psychotherapeutic approaches that address both trauma and psychotic experiences. Future studies need to address how the effects of diverse severely aversive and traumatizing experiences of patients with psychosis may best be treated. This includes psychosocial interactions focusing on the community in a case of systematic social exclusion, as well as psychotherapeutic interventions aiming at specific traumatizing experiences (113, 114). Given the strong effect of indicators of social and racist exclusion (6, 10) on psychosis risk, interventions at a societal level could include fighting stigma and racism, and providing social support to reduce poverty and marginalization, and to increase solidarity and community inclusion (35, 115, 116).

DATA AVAILABILITY STATEMENT

The code and datasets generated for this study can be found on Github: https://github.com/lveaor/Umbrella-review-2021.

AUTHOR CONTRIBUTIONS

LV, JK, CM, YT, and AH planned and prespecified the study protocol and wrote and conceived the paper. LV, JK, and AH screened the literature, and extracted and checked the relevant data. LV and JK did the statistical analysis. All authors fulfilled the ICMJE Criteria for Authorship (117).

FUNDING

This study is supported, in part, by CRC-TR 265. JK is supported by the Charité Clinician-Scientist Program of the Berlin Institute of Health. (https://orcid.org/0000-0001-8155-3683).

ACKNOWLEDGMENTS

We thank Lasse Brandt for his support during the initial screening process.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.665957/full#supplementary-material

REFERENCES

1. American Psychiatric A. *Diagnostic and Statistical Manual of Mental Disorders : DSM-5 / American Psychiatric Association*. 5. ed. Washington, DC: American Psychiatric Publ (2013).
2. Dilling H, Mombour W, Schmidt MH, Schulte-Markwort M, Remschmidt H, Weltgesundheitsorganisation. *Internationale Klassifikation Psychischer Störungen: ICD-10 Kapitel V (F)*. klinisch-diagnostische Leitlinien. *10. Auflage unter Berücksichtigung der Änderungen Entsprechend ICD-10-GM 2015 ed.* Bern: Hogrefe Verlag (2015). p. 449.
3. Barbato A, Initiative WHONfMH, World Health Organization. Division of Mental H, Prevention of Substance A. *Schizophrenia and Public Health / Angelo Barbato*. Geneva: World Health Organization (1997).
4. Ripke S, O'Dushlaine C, Chambert K, Moran JL, Kähler AK, Akterin S, et al. Genome-wide association analysis identifies 13 new risk loci for schizophrenia. *Nature Genetics.* (2013) 45:1150–9. doi: 10.1038/ng.2742
5. Cantor-Graae E, Selten JP. Schizophrenia and migration: a meta-analysis and review. *Am J Psychiatry.* (2005) 162:12–24. doi: 10.1176/appi.ajp.162.1.12
6. Bosqui TJ, Hoy K, Shannon C. A systematic review and meta-analysis of the ethnic density effect in psychotic disorders. *Soc Psychiatry Psychiatr Epidemiol.* (2014) 49:519–29. doi: 10.1007/s00127-013-0773-0
7. McGrath J, Saha S, Welham J, El Saadi O, MacCauley C, Chant D. A systematic review of the incidence of schizophrenia: the distribution of rates and the influence of sex, urbanicity, migrant status and methodology. *BMC Med.* (2004) 2:13. doi: 10.1186/1741-7015-2-13
8. Henssler J, Brandt L, Müller M, Liu S, Montag C, Sterzer P, et al. Migration and schizophrenia: meta-analysis and explanatory framework. *Eur Arch Psychiatry Clin Neurosci.* (2020) 270:325–35. doi: 10.1007/s00406-019-01028-7
9. Brandt L, Henssler J, Müller M, Wall S, Gabel D, Heinz A. Risk of psychosis among refugees: a systematic review and meta-analysis. *JAMA Psychiatry.* (2019) 76:1133–40. doi: 10.1001/jamapsychiatry.2019.1937
10. Heinz A, Deserno L, Reininghaus U. Urbanicity, social adversity and psychosis. *World Psychiatry.* (2013) 12:187–97. doi: 10.1002/wps.20056
11. Radua J, Ramella-Cravaro V, Ioannidis JPA, Reichenberg A, Phiphopthatsanee N, Amir T, et al. What causes psychosis? An umbrella review of risk and protective factors. *World Psychiatry.* (2018) 17:49–66. doi: 10.1002/wps.20490

12. Fusar-Poli P, Cappucciati M, Rutigliano G, Schultze-Lutter F, Bonoldi I, Borgwardt S, et al. At risk or not at risk? A meta-analysis of the prognostic accuracy of psychometric interviews for psychosis prediction. *World Psychiatry*. (2015) 14:322–32. doi: 10.1002/wps.20250
13. Hollander AC, Dal H, Lewis G, Magnusson C, Kirkbride JB, Dalman C. Refugee migration and risk of schizophrenia and other non-affective psychoses: cohort study of 1.3 million people in Sweden. *Bmj*. (2016) 352:i1030. doi: 10.1136/bmj.i1030
14. Read J, Os J, Morrison AP, Ross CA. Childhood trauma, psychosis and schizophrenia: a literature review with theoretical and clinical implications. *Acta Psychiatrica Scandinavica*. (2005) 112:330–50. doi: 10.1111/j.1600-0447.2005.00634.x
15. Bendall S, Jackson HJ, Hulbert CA, McGorry PD. Childhood trauma and psychotic disorders: a systematic, critical review of the evidence. *Schizophr Bull*. (2008) 34:568–79. doi: 10.1093/schbul/sbm121
16. Bailey T, Alvarez-Jimenez M, Garcia-Sanchez AM, Hulbert C, Barlow E, Bendall S. Childhood trauma is associated with severity of hallucinations and delusions in psychotic disorders: a systematic review and meta-analysis. *Schizophr Bull*. (2018) 44:1111–22. doi: 10.1093/schbul/sbx161
17. Ruby E, Rothman K, Corcoran C, Goetz RR, Malaspina D. Influence of early trauma on features of schizophrenia. *Early Interv Psychiatry*. (2017) 11:322–33. doi: 10.1111/eip.12239
18. Fisher HL, Schreier A, Zammit S, Maughan B, Munafò MR, Lewis G, et al. Pathways between childhood victimization and psychosis-like symptoms in the ALSPAC birth cohort. *Schizophr Bull*. (2013) 39:1045–55. doi: 10.1093/schbul/sbs088
19. Bonoldi I, Simeone E, Rocchetti M, Codjoe L, Rossi G, Gambi F, et al. Prevalence of self-reported childhood abuse in psychosis: a meta-analysis of retrospective studies. *Psychiatry Res*. (2013) 210:8–15. doi: 10.1016/j.psychres.2013.05.003
20. Wolke D, Lereya ST, Fisher HL, Lewis G, Zammit S. Bullying in elementary school and psychotic experiences at 18 years: a longitudinal, population-based cohort study. *Psychol Med*. (2014) 44:2199–211. doi: 10.1017/S0033291713002912
21. Lee WE, Kwok CH, Hunter EC, Richards M, David AS. Prevalence and childhood antecedents of depersonalization syndrome in a UK birth cohort. *Soc Psychiatry Psychiatr Epidemiol*. (2012) 47:253–61. doi: 10.1007/s00127-010-0327-7
22. Wild C, Shapiro L, Goldenberg L. Transactional communication disturbance in families of male schizophrenics. *Family Process*. (2004) 14:131–60. doi: 10.1111/j.1545-5300.1975.00131.x
23. Singer MT, Wynne LC. Differentiating characteristics of parents of childhood schizophrenics, childhood neurotics, and young adult schizophrenics. *Am J Psychiatry*. (1963) 120:234–43. doi: 10.1176/ajp.120.3.234
24. Beards S, Gayer-Anderson C, Borges S, Dewey ME, Fisher HL, Morgan C. Life events and psychosis: a review and meta-analysis. *Schizophr Bull*. (2013) 39:740–7. doi: 10.1093/schbul/sbt065
25. Adams R, Brown H, Friston K. Bayesian inference, predictive coding and delusions. *Avant*. (2015) 5:51–88. doi: 10.26913/50302014.0112.0004
26. Heinz A, Murray GK, Schlagenhauf F, Sterzer P, Grace AA, Waltz JA. Towards a unifying cognitive, neurophysiological, and computational neuroscience account of schizophrenia. *Schizophr Bull*. (2019) 45:1092–100. doi: 10.1093/schbul/sby154
27. Sterzer P, Adams RA, Fletcher P, Frith C, Lawrie SM, Muckli L, et al. The predictive coding account of psychosis. *Biol Psychiatry*. (2018) 84:634–43. doi: 10.1016/j.biopsych.2018.05.015
28. Giné Servén E, Boix Quintana E, Martínez Ramírez M, Guanyabens Buscà N, Muriana Batiste D, Guasp M, et al. Cycloid psychosis as a psychiatric expression of anti-NMDAR encephalitis. A systematic review of case reports accomplished with the authors' cooperation. *Brain Behav*. (2021) 11:e01980. doi: 10.1002/brb3.1980
29. Bardol O, Grot S, Oh H, Poulet E, Zeroug-Vial H, Brunelin J, et al. Perceived ethnic discrimination as a risk factor for psychotic symptoms: a systematic review and meta-analysis. *Psychol Med*. (2020) 50:1077–89. doi: 10.1017/S003329172000094X
30. Dallel S, Fakra E, Cancel A. Prevalence of posttraumatic stress disorder in schizophrenia spectrum disorders: a systematic review. *Neuropsychiatry*. (2018) 08. doi: 10.4172/Neuropsychiatry.1000430
31. Grubaugh AL, Zinzow HM, Paul L, Egede LE, Frueh BC. Trauma exposure and posttraumatic stress disorder in adults with severe mental illness: a critical review. *Clin Psychol Rev*. (2011) 31:883–99. doi: 10.1016/j.cpr.2011.04.003
32. van Os J, Kenis G, Rutten BPF. The environment and schizophrenia. *Nature*. (2010) 468:203–12. doi: 10.1038/nature09563
33. Weiser M, van Os J, Reichenberg A, Rabinowitz J, Nahon D, Kravitz E, et al. Social and cognitive functioning, urbanicity and risk for schizophrenia. *Br J Psychiatry*. (2007) 191:320–4. doi: 10.1192/bjp.bp.106.031328
34. van Os J, Pedersen C, Brøbech P. Confirmation of synergy between urbanicity and familial liability in the causation of psychosis. *Am J Psychiatry 161: 2312-2314. Am J Psychiatry*. (2005) 161:2312–4. doi: 10.1176/appi.ajp.161.12.2312
35. Gruebner O, Rapp MA, Adli M, Kluge U, Galea S, Heinz A. Cities and mental health. *Dtsch Arztebl Int*. (2017) 114:121–7. doi: 10.3238/arztebl.2017.0121
36. Cannon M, Jones PB, Murray RM. Obstetric complications and schizophrenia: historical and meta-analytic review. *Am J Psychiatry*. (2002) 159:1080–92. doi: 10.1176/appi.ajp.159.7.1080
37. Risk G, Investigators OiP. Evidence that familial liability for psychosis is expressed as differential sensitivity to cannabis: an analysis of patient-sibling and sibling-control pairs. *Arch Gen Psychiatry*. (2011) 68:138–47. doi: 10.1001/archgenpsychiatry.2010.132
38. Murray RM, Hall W. Will legalization and commercialization of cannabis use increase the incidence and prevalence of psychosis? *JAMA Psychiatry*. (2020) 77:777–8. doi: 10.1001/jamapsychiatry.2020.0339
39. Selten JP, van der Ven E, Termorshuizen F. Migration and psychosis: a meta-analysis of incidence studies. *Psychol Med*. (2020) 50:303–13. doi: 10.1017/S0033291719000035
40. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *J Clin Epidemiol*. (2009) 62:e1–34. doi: 10.1016/j.jclinepi.2009.06.006
41. Varchmin L. *Preregistration Berlin*. (2021). Available online at: https://osf.io/27kxj (accessed January 05, 2021).
42. Fusar-Poli P, Radua J. Ten simple rules for conducting umbrella reviews. *Evid Based Ment Health*. (2018) 21:95–100. doi: 10.1136/ebmental-2018-300014
43. Bernstein DP, Fink L, Handelsman L, Foote J. *Childhood trauma questionnaire. Assessment of Family Violence: A Handbook for Researchers and Practitioners*. American Psychological Association (1998).
44. Ahrens W, Pigeot I. *Handbook of Epidemiology*. Springer (2014).
45. Shea BJ, Grimshaw JM, Wells GA, Boers M, Andersson N, Hamel C, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. *BMC Med Res Methodol*. (2007) 7:10. doi: 10.1186/1471-2288-7-10
46. William GC. The combination of estimates from different experiments. *Biometrics*. (1954) 10:101–29. doi: 10.2307/3001666
47. Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ*. (2003) 327:557–60. doi: 10.1136/bmj.327.7414.557
48. Egger M, Davey Smith G, Schneider M, Minder C. Bias in meta-analysis detected by a simple, graphical test. *BMJ*. (1997) 315:629–34. doi: 10.1136/bmj.315.7109.629
49. Rosenthal R. The file drawer problem and tolerance for null results. *Psychol Bull*. (1979) 86:638–41. doi: 10.1037/0033-2909.86.3.638
50. Duval S, Tweedie R. Trim and fill: a simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*. (2000) 56:455–63. doi: 10.1111/j.0006-341X.2000.00455.x
51. Furuya-Kanamori L, Barendregt JJ, Doi SAR. A new improved graphical and quantitative method for detecting bias in meta-analysis. *Int J Evid Based Healthc*. (2018) 16:195–203. doi: 10.1097/XEB.0000000000000141
52. Borenstein. *Introduction to Meta-Analysis*. New York, NY: John Wiley & Sons (2009).p. 421.
53. Ebert DD. *Doing Meta-Analysis with R: A Hands-On Guide*. Boca Raton, FL; London: Chapmann & Hall/CRC Press (2021).
54. Team R. *R Studio: Integrated Development for R. RStudio*. Boston, MA. (2020). Available online at: http://www.rstudio.com/ (accessed January 22, 2021).

55. Schwarzer G, Carpenter J, Rücker G. *Meta-Analysis With R*. Springer (2015) 3–17. doi: 10.1007/978-3-319-21416-0
56. Wolfgang V. Bias and efficiency of meta-analytic variance estimators in the random-effects model. *J Educ Behav Stat*. (2005) 30:261–93. doi: 10.3102/10769986030003261
57. DerSimonian R, Laird N. Meta-analysis in clinical trials. *Control Clin Trials*. (1986) 7:177–88. doi: 10.1016/0197-2456(86)90046-2
58. Faraone SV. Interpreting estimates of treatment effects: implications for managed care. *PT*. (2008) 33:700–11.
59. Lakens D. Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Front Psychol*. (2013) 4:863. doi: 10.3389/fpsyg.2013.00863
60. Cohen J. Statistical power analysis for the behavioral sciences: Academic press; 2013. doi: 10.4324/9780203771587
61. von Hippel PT. The heterogeneity statistic I(2) can be biased in small meta-analyses. *BMC Med Res Methodol*. (2015) 15:35. doi: 10.1186/s12874-015-0024-z
62. Sterne JAC, Sutton AJ, Ioannidis JPA, Terrin N, Jones DR, Lau J, et al. Recommendations for examining and interpreting funnel plot asymmetry in meta-analyses of randomised controlled trials. *BMJ*. (2011) 343:d4002 doi: 10.1136/bmj.d4002
63. Matheson SL, Shepherd AM, Laurens KR, Carr VJ. A systematic meta-review grading the evidence for non-genetic risk factors and putative antecedents of schizophrenia. *Schizophr Res*. (2011) 133:133–42. doi: 10.1016/j.schres.2011.09.020
64. Nielssen O, Sara G, Lim Y, Large M. Country of birth and hospital treatment for psychosis in New South Wales. *Soc Psychiatry Psychiatr Epidemiol*. (2013) 48:613–20. doi: 10.1007/s00127-012-0577-7
65. Castillejos MC, Martín-Pérez C, Moreno-Küstner B. Incidence of psychotic disorders and its association with methodological issues. A systematic review and meta-analyses. *Schizophr Res*. (2019) 204:458–9. doi: 10.1016/j.schres.2018.07.031
66. Olbert CM, Nagendra A, Buck B. Meta-analysis of Black vs. White racial disparity in schizophrenia diagnosis in the United States: Do structured assessments attenuate racial disparities? *J Abnorm Psychol*. (2018) 127:104–15. doi: 10.1037/abn0000309
67. Varese F, Smeets F, Drukker M, Lieverse R, Lataster T, Viechtbauer W, et al. Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective- and cross-sectional cohort studies. *Schizophr Bull*. (2012) 38:661–71. doi: 10.1093/schbul/sbs050
68. Bourque F, van der Ven E, Malla A. A meta-analysis of the risk for psychotic disorders among first- and second-generation immigrants. *Psychol Med*. (2011) 41:897–910. doi: 10.1017/S0033291710001406
69. Pastore A, de Girolamo G, Tafuri S, Tomasicchio A, Margari F. Traumatic experiences in childhood and adolescence: a meta-analysis of prospective studies assessing risk for psychosis. *Eur Child Adolesc Psychiatry*. (2020). doi: 10.1007/s00787-020-01574-9
70. Rafiq S, Campodonico C, Varese F. The relationship between childhood adversities and dissociation in severe mental illness: a meta-analytic review. *Acta Psychiatr Scand*. (2018) 138:509–25. doi: 10.1111/acps.12969
71. de Sousa P, Varese F, Sellwood W, Bentall RP. Parental communication and psychosis: a meta-analysis. *Schizophr Bull*. (2014) 40:756–68. doi: 10.1093/schbul/sbt088
72. Kirkbride JB, Errazuriz A, Croudace TJ, Morgan C, Jackson D, Boydell J, et al. Incidence of schizophrenia and other psychoses in England, 1950-2009: a systematic review and meta-analyses. *PLoS ONE*. (2012) 7:e31660. doi: 10.1371/journal.pone.0031660
73. Anderson KK, Edwards J. Age at migration and the risk of psychotic disorders: a systematic review and meta-analysis. *Acta Psychiatr Scand*. (2020) 141:410–20. doi: 10.1111/acps.13147
74. Adams RA, Stephan KE, Brown HR, Frith CD, Friston KJ. The computational anatomy of psychosis. *Front Psychiatry*. (2013) 4:47. doi: 10.3389/fpsyt.2013.00047
75. Heinz A. *Soziale Exklusion und Psychische Gesundheit*. Berlin: Berliner Institut fempirische Integrations- und Migrationsforschung (2017). p. 72–85.
76. Heinz A. Dopaminergic dysfunction in alcoholism and schizophrenia–psychopathological and behavioral correlates. *Eur Psychiatry*. (2002) 17:9–16. doi: 10.1016/S0924-9338(02)00628-4
77. Lupien SJ, McEwen BS, Gunnar MR, Heim C. Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nat Rev Neurosci*. (2009) 10:434–45. doi: 10.1038/nrn2639
78. Bisson JI, Roberts NP, Andrew M, Cooper R, Lewis C. Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. *Cochrane Database Syst Rev*. (2013) 2013:Cd003388. doi: 10.1002/14651858.CD003388.pub4
79. Watts BV, Schnurr PP, Mayo L, Young-Xu Y, Weeks WB, Friedman MJ. Meta-analysis of the efficacy of treatments for posttraumatic stress disorder. *J Clin Psychiatry*. (2013) 74:e541–50. doi: 10.4088/JCP.12r08225
80. Coventry PA, Meader N, Melton H, Temple M, Dale H, Wright K, et al. Psychological and pharmacological interventions for posttraumatic stress disorder and comorbid mental health problems following complex traumatic events: systematic review and component network meta-analysis. *PLoS Med*. (2020) 17:e1003262. doi: 10.1371/journal.pmed.1003262
81. Schäfer I, Gast U, Hofmann A, Knaevelsrud C, Lampe A, Liebermann P, et al. *S3-Leitlinie : Posttraumatische Belastungsstörung*. Berlin: Springer (2019).
82. Thompson CT, Vidgen A, Roberts NP. Psychological interventions for post-traumatic stress disorder in refugees and asylum seekers: a systematic review and meta-analysis. *Clin Psychol Rev*. (2018) 63:66–79. doi: 10.1016/j.cpr.2018.06.006
83. Karatzias T, Murphy P, Cloitre M, Bisson J, Roberts N, Shevlin M, et al. Psychological interventions for ICD-11 complex PTSD symptoms: systematic review and meta-analysis. *Psychol Med*. (2019) 49:1761–75. doi: 10.1017/S0033291719000436
84. Ronconi JM, Shiner B, Watts BV. Inclusion and exclusion criteria in randomized controlled trials of psychotherapy for PTSD. *J Psychiatr Pract*. (2014) 20:25–37. doi: 10.1097/01.pra.0000442936.23457.5b
85. Pharoah F, Mari JJ, Rathbone J, Wong W. Family intervention for schizophrenia. *Cochrane Database Syst Rev*. (2010). doi: 10.1002/14651858.CD000088.pub3
86. Turner DT, van der Gaag M, Karyotaki E, Cuijpers P. Psychological interventions for psychosis: a meta-analysis of comparative outcome studies. *Am J Psychiatry*. (2014) 171:523–38. doi: 10.1176/appi.ajp.2013.13081159
87. Jones C, Hacker D, Xia J, Meaden A, Irving CB, Zhao S, et al. Cognitive behavioural therapy plus standard care versus standard care for people with schizophrenia. *Cochrane Database Syst Rev*. (2018). doi: 10.1002/14651858.CD007964.pub2
88. Turner DT, Reijnders M, van der Gaag M, Karyotaki E, Valmaggia LR, Moritz S, et al. Efficacy and moderators of cognitive behavioural therapy for psychosis versus other psychological interventions: an individual-participant data meta-analysis. *Front Psychiatry*. (2020) 11. doi: 10.3389/fpsyt.2020.00402
89. Sin J, Spain D, Furuta M, Murrells T, Norman I. Psychological interventions for post-traumatic stress disorder (PTSD) in people with severe mental illness. *Cochrane Database Syst Rev*. (2017) 1:CD011464–CD. doi: 10.1002/14651858.CD011464.pub2
90. van den Berg DP, de Bont PA, van der Vleugel BM, de Roos C, de Jongh A, Van Minnen A, et al. Prolonged exposure vs eye movement desensitization and reprocessing vs waiting list for posttraumatic stress disorder in patients with a psychotic disorder: a randomized clinical trial. *JAMA Psychiatry*. (2015) 72:259–67. doi: 10.1001/jamapsychiatry.2014.2637
91. Mueser KT, Rosenberg SD, Xie H, Jankowski MK, Bolton EE, Lu W, et al. A randomized controlled trial of cognitive-behavioral treatment for posttraumatic stress disorder in severe mental illness. *J Consult Clin Psychol*. (2008) 76:259–71. doi: 10.1037/0022-006X.76.2.259
92. Mueser KT, Gottlieb JD, Xie H, Lu W, Yanos PT, Rosenberg SD, et al. Evaluation of cognitive restructuring for post-traumatic stress disorder in people with severe mental illness. *Br J Psychiatry*. (2015) 206:501–8. doi: 10.1192/bjp.bp.114.147926
93. Steel C, Hardy A, Smith B, Wykes T, Rose S, Enright S, et al. Cognitive-behaviour therapy for post-traumatic stress in schizophrenia. A randomized controlled trial. *Psychol Med*. (2017) 47:43–51. doi: 10.1017/S0033291716002117

94. Spidel A, Lecomte T, Kealy D, Daigneault I. Acceptance and commitment therapy for psychosis and trauma: improvement in psychiatric symptoms, emotion regulation, and treatment compliance following a brief group intervention. *Psychol Psychother.* (2018) 91:248–61. doi: 10.1111/papt.12159
95. van den Berg DP, de Bont PA, van der Vleugel BM, de Roos C, de Jongh A, van Minnen A, et al. Trauma-focused treatment in PTSD patients with psychosis: symptom exacerbation, adverse events, and revictimization. *Schizophr Bull.* (2016) 42:693–702. doi: 10.1093/schbul/sbv172
96. de Bont PA, van Minnen A, de Jongh A. Treating PTSD in patients with psychosis: a within-group controlled feasibility study examining the efficacy and safety of evidence-based PE and EMDR protocols. *Behav Ther.* (2013) 44:717–30. doi: 10.1016/j.beth.2013.07.002
97. Hillis JD, Bidlack N, Macobin B. Metacognitive reflection and insight therapy (MERIT) for persons with a schizophrenia spectrum disorder and interpersonal trauma. *Am J Psychother.* (2018) 71:186–95. doi: 10.1176/appi.psychotherapy.20180031
98. van der Gaag M, van den Berg D, Ising H. CBT in the prevention of psychosis and other severe mental disorders in patients with an at risk mental state: a review and proposed next steps. *Schizophr Res.* (2019) 203:88–93. doi: 10.1016/j.schres.2017.08.018
99. Varese F, Douglas M, Dudley R, Bowe S, Christodoulides T, Common S, et al. Targeting dissociation using cognitive behavioural therapy in voice hearers with psychosis and a history of interpersonal trauma: a case series. *Psychol Psychother.* (2020) 94:e12304. doi: 10.1111/papt.12304
100. Weijers J, Ten Kate C, Viechtbauer W, Rampaart LJA, Eurelings EHM, Selten JP. Mentalization-based treatment for psychotic disorder: a rater-blinded, multi-center, randomized controlled trial. *Psychol Med.* (2020) 1–10. doi: 10.1017/S0033291720001506
101. Rosenbaum B, Harder S, Knudsen P, Køster A, Lindhardt A, Lajer M, et al. Supportive psychodynamic psychotherapy versus treatment as usual for first-episode psychosis: two-year outcome. *Psychiatry.* (2012) 75:331–41. doi: 10.1521/psyc.2012.75.4.331
102. Stuke F, Bröcker AL, Bayer S, Heinz A, Bermpohl F, Lempa G, et al. Between a rock and a hard place: associations between Mentzos' "dilemma", self-reported interpersonal problems, and psychosocial functioning in individuals with non-affective psychoses. *Clin Psychol Psychother.* (2020) 27:528–41. doi: 10.1002/cpp.2437
103. Lempa Gn. Psychodynamische psychotherapie der schizophrenien: ein manual. 2, aktualisierte Auflage ed. In: Haebler Dv, Montag C, Psychosozial V, editors. *Psychodynamische Psychotherapie der Schizophrenien: Ein Manual*. Gießen: Psychosozial-Verlag (2017). p. 188.
104. Attard A, Larkin M. Art therapy for people with psychosis: a narrative review of the literature. *Lancet Psychiatry.* (2016) 3:1067–78. doi: 10.1016/S2215-0366(16)30146-8
105. Excellence NIfHaC. *Psychosis and Schizophrenia in Adults: Prevention and Management.* (2014). Available online at: https://www.nice.org.uk/guidance/cg178/resources (accessed January 29, 2021).
106. Laws KR, Conway W. Do adjunctive art therapies reduce symptomatology in schizophrenia? A meta-analysis. *World J Psychiatry.* (2019) 9:107–20. doi: 10.5498/wjp.v9.i8.107
107. Crawford MJ, Killaspy H, Kalaitzaki E, Barrett B, Byford S, Patterson S, et al. The MATISSE study: a randomised trial of group art therapy for people with schizophrenia. *BMC Psychiatry.* (2010) 10:65. doi: 10.1186/1471-244X-10-65
108. Crawford MJ, Killaspy H, Barnes TR, Barrett B, Byford S, Clayton K, et al. Group art therapy as an adjunctive treatment for people with schizophrenia: multicentre pragmatic randomised trial. *BMJ.* (2012) 344:e846. doi: 10.1136/bmj.e846
109. Montag C, Haase L, Seidel D, Bayerl M, Gallinat J, Herrmann U, et al. A pilot RCT of psychodynamic group art therapy for patients in acute psychotic episodes: feasibility, impact on symptoms and mentalising capacity. *PLoS ONE.* (2014) 9:e112348. doi: 10.1371/journal.pone.0112348
110. Schouten KA, de Niet GJ, Knipscheer JW, Kleber RJ, Hutschemaekers GJ. The effectiveness of art therapy in the treatment of traumatized adults: a systematic review on art therapy and trauma. *Trauma Viol Abuse.* (2015) 16:220–8. doi: 10.1177/1524838014555032
111. Baker FA, Metcalf O, Varker T, O'Donnell M. A systematic review of the efficacy of creative arts therapies in the treatment of adults with PTSD. *Psychol Trauma.* (2018) 10:643–51. doi: 10.1037/tra0000353
112. Dykxhoorn J, Lewis G, Hollander A-C, Kirkbride J, Dalman C. Association of neighbourhood migrant density and risk of non-affective psychosis: a national, longitudinal cohort study. *Lancet Psychiatry.* (2020) 7:327–36. doi: 10.1016/S2215-0366(20)30059-6
113. Schouler-Ocak M, Bhugra D, Kastrup MC, Dom G, Heinz A, Küey L, et al. Racism and mental health and the role of mental health professionals. *Eur Psychiatry.* (2021) 64:e42. doi: 10.1192/j.eurpsy.2021.2216
114. Brand RM, McEnery C, Rossell S, Bendall S, Thomas N. Do trauma-focussed psychological interventions have an effect on psychotic symptoms? A systematic review and meta-analysis. *Schizophr Res.* (2018) 195:13–22. doi: 10.1016/j.schres.2017.08.037
115. Heinz A, Zhao X, Liu S. Implications of the association of social exclusion with mental health. *JAMA Psychiatry.* (2020) 77:113–4. doi: 10.1001/jamapsychiatry.2019.3009
116. Drukker M, Gunther N, van Os J. Disentangling associations between poverty at various levels of aggregation and mental health. *Epidemiol Psichiatria Sociale.* (2007) 16:3–9. doi: 10.1017/S1121189X00004541
117. Editors ICoMJ. *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals*. International Committee of Medical Journal Editors (2019).

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

frontiers in Psychiatry

ORIGINAL RESEARCH
published: 25 November 2021
doi: 10.3389/fpsyt.2021.674263

Media Exposure and the Risk of Post-traumatic Stress Disorder Following a Mass Traumatic Event: An *In-silico* Experiment

Salma M. Abdalla, Gregory H. Cohen, Shailesh Tamrakar, Shaffi Fazaludeen Koya and Sandro Galea*

Department of Epidemiology, School of Public Health, Boston University, Boston, MA, United States

OPEN ACCESS

Edited by:
Jutta Lindert, University of Applied Sciences Emden Leer, Germany

Reviewed by:
Joseph El-Khoury, American University of Beirut, Lebanon
Ioanna Despoina Bergiannaki Dermitzaki, National and Kapodistrian University of Athens, Greece

****Correspondence:***
Salma M. Abdalla
abdallas@bu.edu

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Psychiatry

Received: *01 March 2021*
Accepted: *22 October 2021*
Published: *25 November 2021*

Citation:
Abdalla SM, Cohen GH, Tamrakar S, Koya SF and Galea S (2021) Media Exposure and the Risk of Post-traumatic Stress Disorder Following a Mass Traumatic Event: An In-silico Experiment. Front. Psychiatry 12:674263. doi: 10.3389/fpsyt.2021.674263

Introduction: Following mass traumatic events, greater exposure to traditional media like television (TV) about the event is associated with higher burden of post-traumatic stress disorder (PTSD). However, we know little about how social media exposure, combined with other media sources, shapes the population burden of PTSD following mass traumatic events.

Materials and Methods: We built a microsimulation of 1,18,000 agents that was demographically comparable to the population of Parkland and Coral Springs, Florida that experienced the Stoneman Douglas High School shooting in 2018. We parametrized the model using data from prior traumatic events and built an internal social network structure to facilitate the estimation of community PTSD prevalence following exposure to TV and social media coverage of the shooting.

Results: Overall, PTSD prevalence in the community due to exposure to TV coverage of the shooting was 3.1%. Shifting the whole population's hours of TV watching to the lower half of the population distribution decreased PTSD prevalence to 1.3% while increasing TV watching to the upper half of the distribution increased the prevalence to 3.5%. Casual (i.e., viewing posts) social media use in addition to exposure to TV coverage increased PTSD prevalence to 3.4%; overall prevalence increased to 5.3% when agents shared videos related to the shooting on social media.

Conclusion: This microsimulation shows that availability and exposure to media coverage of mass traumatic events, particularly as social media becomes more ubiquitous, has the potential to increase community PTSD prevalence following these events. Future research could fruitfully examine the mechanisms that might explain these associations and potential interventions that can mitigate the role of media in shaping the mental health of populations following traumatic events.

Keywords: PTSD—post-traumatic stress disorder, mental health, social media, mass shooting, mass traumatic events, media exposure

INTRODUCTION

There is abundance of evidence indicating that mass traumatic events—such as natural disasters, large-scale attacks, and disease outbreaks—are associated with long lasting psychological consequences including depression and post-traumatic stress disorder (PTSD) (1–6). A recent review of the literature offers a wide range of PTSD prevalence estimates following a mass-shooting event ranging from 3% among parents of children exposed to a mass shooting to 91% among children in the same analysis (7). Exposure to traditional media coverage (including television (TV) and radio) of such events has also been associated with higher burden of mental disorders, both among persons who were directly affected by the event, and in the general population (8–11).

The emergence of social media as a ubiquitous presence introduces a new question: How does exposure to social media coverage of mass traumatic events affect the burden of PTSD in a community following a mass traumatic event?

Early evidence suggests that social media viewing of coverage of mass traumatic events is associated with adverse psychological consequences (12–14). However, the literature on the subject remains sparse. Given the increasing popularity of broadcasting trauma-related news on both 24-news cycles on TV and on social media, it is important to better understand how media exposure shapes the burden of PTSD in a population following mass traumatic events.

This is particularly relevant as the COVID-19 pandemic unfolds as a mass traumatic event with mental health consequences (2, 5, 15–19). For example, a recent study showed that persons who were exposed to COVID-19 related information on social media frequently had higher odds of anxiety compared to those with less exposure to COVID-19 related information on social media (20).

To help address this gap in our knowledge, we developed an *in-silico* experiment using a microsimulation. Public health often relies on linear methods to investigate the relationship between exposures and outcomes. Over the past century, however, there has been increasing appreciation of methods—such as agent-based modeling (ABMs) microsimulations—that aim to address the complexity of populations and the role of complexity in shaping population health. ABMs simulate the behaviors of autonomous "agents." These agents represent individuals who then interact and form a synthetic population of interest, allowing for macro-level behaviors to emerge. They are appropriate for research questions that are based on a complex set of individual attributes, inter-agent interactions, and environment, as is the case with gun violence. Simulations allow for the development of counterfactual estimates, when given appropriate inputs, especially in the absence of real-world data on a subject (21). They have been used to answer many complex questions in public health including assessment of the impact of different policies on population health and health inequities; the role social networks and neighborhoods play in population levels of obesity; and potential interventions to reduce risky health behaviors at a population level (22). More recently, ABMs have been used in relation to mass traumatic events and population mental health (23, 24). In this paper we used a simulation to examine the role of exposure to TV and social media coverage of a mass traumatic event in shaping community PTSD prevalence.

MATERIALS AND METHODS

Simulated Population

To ground our microsimulation in a recent mass traumatic event, we simulated the Stoneman Douglas High School (Parkland) shooting in 2018, which left 17 persons dead, 17 injured, and catalyzed a national conversation on the consequences of gun violence in the country, leading to widespread social media coverage. We initialized a population of 1,18,000 agents that was demographically comparable to the population of Parkland and Coral Springs, Florida, where the shootings took place. The demographic (sex, age, and race/ethnicity) parameters for this synthetic population were applied using data derived from the 2010–2015 American Community Survey (ACS) 5-year population estimates for the area (25).

Level of Exposure

We designated within our model three levels of exposure to the event: primary, secondary, and tertiary. Primary exposure included agents who were injured or were present and in danger of being victims at the site of the mass shooting (900 students and 30 adults). We then built an internal social network to connect those directly affected with agents assigned as family or close friends. These 4,725 agents were assigned secondary level exposure in our simulation. Tertiary exposure included 1,12,189 adults living in the affected community at large but were directly affected or assigned as family or close friends to those directly affected. Using those in the tertiary exposure group, we simulated patterns of social media exposure, alone or coupled with TV exposure, and the frequency of such exposure during the first week following the mass shooting.

Media Exposure

We used data from the Pew research center to calculate the percentage of agents to randomly assign TV as the preferred media outlet to receive news, stratified by age group (**Supplementary Material**).

Among agents who watched TV as their preferred news outlet, we used empirical data from a prior analysis to assign the number of hours of TV coverage of the traumatic event watched by agents (9). We also used data from another analysis to randomly assign PTSD status to agents based on their exposure to TV coverage of the event (11). To assess the added psychological association of exposure to social media among agents that watched TV, we used data from an analysis that examined the added association of sharing posts on social media and of viewing videos about the mass traumatic event (14).

Shifting Population Distribution of Media Coverage

We implemented multiple scenarios that shifted the total number of hours of using TV in the population to estimate the potential association of changing media exposure on PTSD prevalence

TABLE 1 | Comparison of Broward County American Community Survey (ACS) estimates with model synthetic population.

Demographic group	Broward County, FL population (2010–2015 ACS Estimates) % (*N* = 1,843,152)	Model Population % (*N* = 1,728,265)
Sex		
Female	51.452	51.142
Male	48.548	48.858
Age		
Under 20 years	24.01	24.38
20 to 44 years	33.15	33.38
45 to 64 years	27.83	27.74
65 and over	15.01	14.50
Race/Ethnicity		
White (Non-hispanic)	40.40	40.07
Hispanic	26.976	26.78
Black (Non-hispanic)	26.90	27.20
Asian (Non-hispanic)	3.43	3.45
American Indian and Alaskan Native (Non-hispanic)	0.17	0.24
Some other race (Non-hispanic)	0.45	0.52
Two or more race (Non-hispanic)	1.67	1.74
Education		
Up to 12th grade	12.36	12.64
High School	27.83	28.09
Some College	21.77	21.54
Associate's degree	9.62	9.64
Bachelor's degree	18.48	18.44
Graduate degree	9.94	9.65

in the population. These included the following scenarios: in scenario 1 agents watched TV <4 h per day, in scenario 2 all agent preferences were shifted to the lower half of population TV watching distribution (i.e., all agents either watched 4 or fewer or 4–7 h of TV coverage), in scenario 3 all agent preferences were shifted to the upper half of population TV watching distribution (i.e., all agents either watched 8–11 or 12 or more h of TV coverage).

Technical Details

The microsimulation was developed using C++ and implemented using Microsoft Visual Studio 2012 (Microsoft Corp). We ran each model scenario 50 times to account for stochasticity in the modeling process, with mean statistical measures reported. We then computed the 2.5th and 97.5th percentiles across those 50 simulations. The **Supplementary Material** provides an overview of the design concept and detailed protocol for this study including sub-models, pseudocodes, and a more in-depth focus on the microsimulation design concepts (**Appendix 1**).

RESULTS

Our simulated synthetic population closely resembled the 2010–2015 ACS 5-year age, sex, race/ethnicity, and education population distribution of Parkland and Coral Springs, Florida (**Table 1**). Overall, PTSD prevalence in the population based on exposure to TV coverage of the shooting was 3.1%.

TV Coverage Interventions and PTSD Prevalence

Compared to the baseline, moving the distribution of agent preferences for the number of hours watching TV to lower daily exposure (scenarios 1 and 2) was associated with a decrease in PTSD prevalence to 0.3 and 1.3% in scenarios 1 and 2, respectively. Shifting agent preferences to higher daily TV coverage exposure (scenario 3) was associated with an increase in PTSD prevalence to 3.5% (**Figure 1**).

Social Media Coverage in Addition to TV Coverage

Adding casual social media use (scrolling through social media posts about the event) to watching TV led to an increase in the prevalence to 3.4%. When agents were assigned watching videos about the news on social media in addition to TV coverage, the prevalence of PTSD increased to 5.3% (**Figure 2**).

DISCUSSION

Using a microsimulation, we estimated community PTSD prevalence based on exposure to TV and social media content in Parkland and Coral Springs, Florida following the Parkland mass shooting of 2018. There were two key observations. First, decreasing population level TV exposure is associated with significant reductions in population PTSD prevalence and, second, exposure to social media coverage in addition to TV coverage can increase PTSD prevalence.

These findings suggest that decreasing TV exposure can be associated with a substantial reduction in population PTSD prevalence. Reducing TV coverage exposure in this simulation led to up to 90% decrease in prevalence in the general population. By contrast, increasing TV exposure was associated with a modest (15%) increase in PTSD prevalence. This can potentially be explained by the TV exposure distribution in the population, with the majority of the population (75.6%) already experiencing high exposure levels (8–11 and 12 and more h) as a baseline. This suggests that efforts to reduce TV exposure of mass traumatic events have the potential to substantially improve population mental health. These results build on other studies that show an increase in PTSD prevalence as the number of hours spent on watching TV coverage increases. For example, following the September 11 terrorist attack, an analysis showed the prevalence of PTSD increased as the number of hours spent on watching TV daily after the attack increased. PTSD prevalence among those who watched four h or less was 0.8% and the prevalence was as high as 10.1% among those who watched TV for 12 h or more (11).

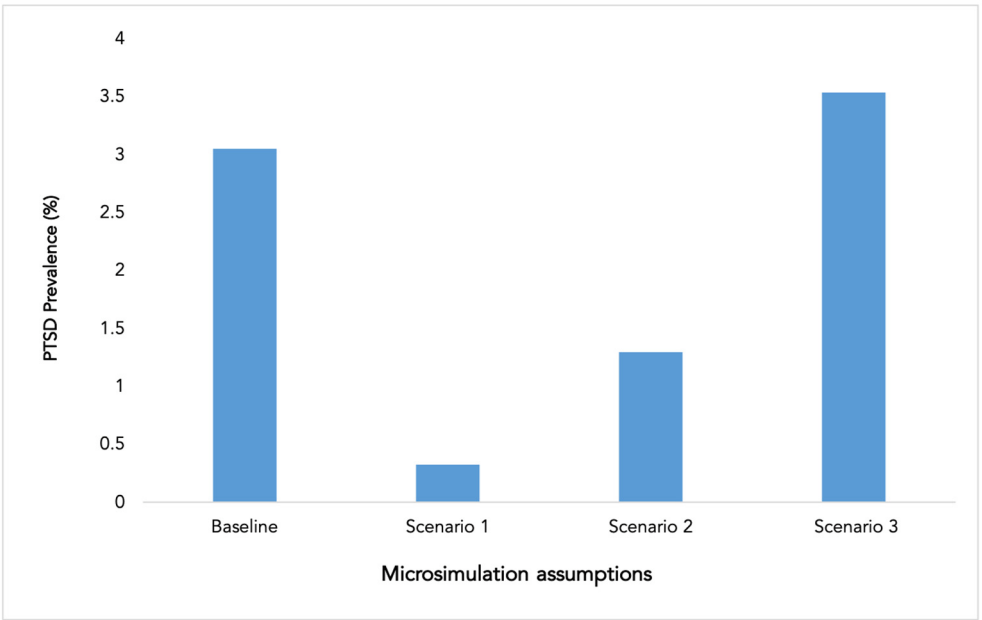

FIGURE 1 | Exposure to television coverage of Parkland mass shooting and post-traumatic stress disorder (PTSD) prevalence. Baseline included a distribution of 11.2% agents watching <4 h, 13.1% watching between 4–7 h, 10.8% watching between 8–11 h, and 64.9% watching 12 h or more. Scenario 1: agents watched television <4 h per day. Scenario 2: all agent preferences were shifted to the lower half of population television watching distribution (i.e., all agents either watched 4 or less h or 4–7 h of television coverage). Scenario 3: all agent preferences were shifted to the upper half of population television watching distribution (i.e., all agents ether watched 8–11 h 12 or more hours of television coverage).

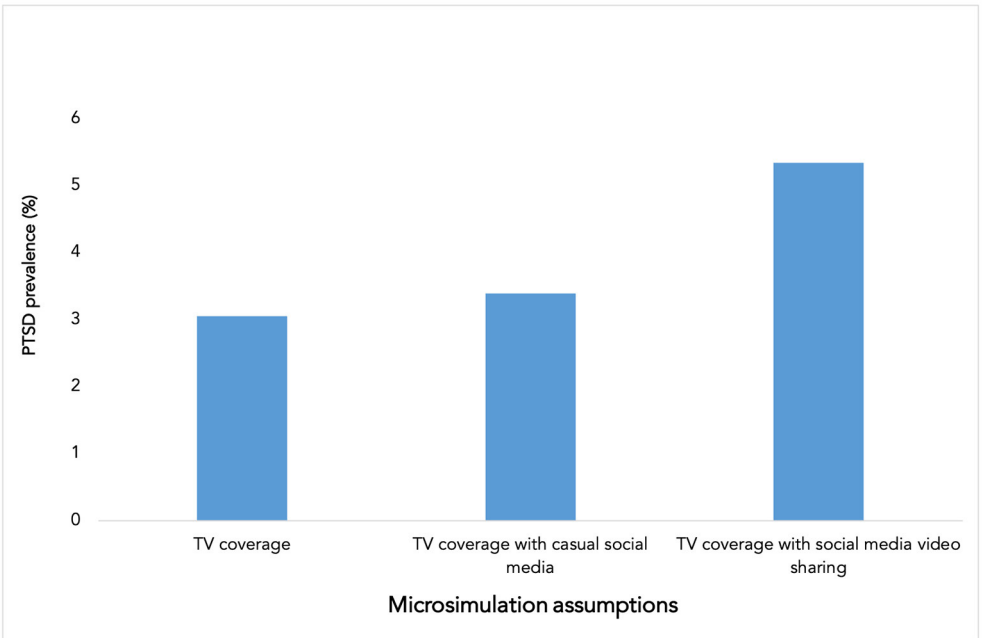

FIGURE 2 | Exposure to television and social media coverage of the Parkland mass shooting and probable post-traumatic stress disorder (PTSD) prevalence. Casual social media use refers to viewing posts.

We found that adding social media exposure to TV exposure can lead to a greater burden of PTSD, which almost doubles when the social media engagement includes sharing videos about the event. This echoes emerging evidence that exposure to social media relevant to traumatic events is associated with increased PTSD prevalence. For example, following the social

unrest in Hong Kong in 2019, Ni et al. found that PTSD prevalence in the community was affected by the number of hours spent on relevant social media per day. PTSD prevalence was 7.2% among non-users, 12.6% among those who used social media for <2 h per day, and 23.5% among those who used social media to follow sociopolitical news for 2 h or more per day (26). Following Typhoon Hato in Macao, China, indirect exposure to information relevant to the typhoon through social media content about the typhoon or emotional reactions of those directly affected was associated with higher odds of PTSD (14). The increase in PTSD prevalence when assigning video watching compared to casually engaging with social media posts can potentially be explained because sharing videos may represent more investment in the particulars of the traumatic event. It is also possible that images are more evocative of a traumatic event experience and as such more salient as a traumatic stressor. This would be consistent with observations about the importance of particular visual images for PTSD in the aftermath of the September 11, 2001 terrorist attacks (9).

Limitations

Our analysis should be considered with limitations in mind. First, and importantly, this was a simulation, with limited generalizability. The findings are based on the design and assumptions of our model, which are based on the results of several epidemiological studies. Each of these studies has its own limitations. However, the peer-reviewed studies we used to provide parameters afford confidence in the estimates provided by our simulation. We also aimed to stratify media exposure by age group within the population to provide a more accurate distribution of PTSD prevalence that accounts for the differences in media outlet preferences in the population. We see this simulation as essential, formative work, paving the way for more empirical research on the topic. Second, these results only apply to those who use TV as their preferred source of news. Given the absence of empiric data, we could not account for the PTSD prevalence among those who receive their news from other sources. Third, while our analysis aims to differentiate between two levels of social media engagement, we do not offer insight about how different types of exposure (e.g., news updates vs. photos of victims) could affect PTSD prevalence. This is due to the paucity of empirical data around the subject, limiting our ability to add these assumptions to the model.

Conclusion

Using a microsimulation, we document the relative contribution of exposure to TV and social media coverage of a mass shooting to community PTSD prevalence. We found that the constant availability and exposure to media coverage of mass traumatic events through either 24-h news cycle TV and social media, particularly as social media becomes more ubiquitous, has the potential to increase the burden of community PTSD following such events. We note that while TV remains the main source for news in the US, use of social media has been on rise over the past decade, suggesting that our findings would change as news consumptions preferences change, particularly if social media becomes a dominant source of news consumption coupled with TV over time (27). To that end, future research should focus on further quantifying the role of social media, and other media outlets, in shaping PTSD prevalence following mass traumatic events and the potential interventions that could mitigate the role media plays in shaping the mental health consequences of mass traumatic events.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

SA and GC designed the research and gathered data. ST conducted the data analyses with support from SA and GC. SA, GC, and SFK interpreted the data with support from SG. SA wrote the first draft of the manuscript. SG read and revised the first draft. All authors read and approved the final manuscript.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.674263/full#supplementary-material

REFERENCES

1. Neria Y, Nandi A, Galea S. Post-traumatic stress disorder following disasters: a systematic review. *Psychol Med.* (2008) 38:467–80. doi: 10.1017/S0033291707001353
2. Jalloh MF Li W, Bunnell RE, Ethier KA, O'Leary A, Hageman KM, et al. Impact of Ebola experiences and risk perceptions on mental health in Sierra Leone, July 2015. *BMJ Glob Heal.* (2018) 3:e000471. doi: 10.1136/bmjgh-2017-000471
3. Galea S, Brewin CR, Gruber M, Jones RT, King DW, King LA, et al. Exposure to hurricane-related stressors and mental illness after Hurricane Katrina. *Arch Gen Psychiatry.* (2007) 64:1427–34. doi: 10.1001/archpsyc.64.12.1427
4. Silver RC, Alison Holman E, McIntosh DN, Poulin M, Gil-Rivas V. Nationwide longitudinal study of psychological responses to September 11. *J Am Med Assoc.* (2002) 288:1235–44. doi: 10.1001/jama.288.10.1235
5. Goldmann E, Galea S. Mental Health Consequences of Disasters. *Annu Rev Public Health.* (2014) 35:169–83. doi: 10.1146/annurev-publhealth-032013-182435
6. Galea S, Ahern J, Resnick H, Kilpatrick D, Bucuvalas M, Gold J, et al. Psychological sequelae of the september 11 terrorist attacks in New York City. *N Engl J Med.* (2002) 346:982–7. doi: 10.1056/NEJMsa013404
7. Lowe SR, Galea S. The mental health consequences of mass shootings. *Trauma Violence Abus.* (2017) 18:62–82. doi: 10.1177/1524838015591572
8. Neria Y, Sullivan GM. Understanding the mental health effects of indirect exposure to mass trauma through the media. *JAMA.* (2011) 306:1374–5. doi: 10.1001/jama.2011.1358

9. Ahern J, Galea S, Resnick H, Kilpatrick D, Bucuvalas M, Gold J, et al. Television images and psychological symptoms after the September 11 terrorist attacks. *Psychiatry.* (2002) 65:289–300. doi: 10.1521/psyc.65.4.289.20240
10. Thompson RR, Jones NM, Holman EA, Silver RC. Media exposure to mass violence events can fuel a cycle of distress. *Sci Adv.* (2019) 5:eaav3502. doi: 10.1126/sciadv.aav3502
11. Schlenger WE, Caddell JM, Ebert L, Jordan BK, Rourke KM, Wilson D, et al. Psychological reactions to terrorist attacks: findings from the National Study of Americans' Reactions to September 11. *J Am Med Assoc.* (2002) 288:581–8. doi: 10.1001/jama.288.5.581
12. Goodwin R, Palgi Y, Hamama-Raz Y, Ben-Ezra M. In the eye of the storm or the bullseye of the media: social media use during Hurricane Sandy as a predictor of post-traumatic stress. *J Psychiatr Res.* (2013) 47:1099–100. doi: 10.1016/j.jpsychires.2013.04.006
13. Holman EA, Garfin DR, Silver RC. Media's role in broadcasting acute stress following the Boston Marathon bombings. *Proc Natl Acad Sci U S A.* (2014) 111:93–8. doi: 10.1073/pnas.1316265110
14. Hall BJ, Xiong YX, Yip PSY, Lao CK, Shi W, Sou EKL, et al. The association between disaster exposure and media use on post-traumatic stress disorder following Typhoon Hato in Macao, China. *Eur J Psychotraumatol.* (2019) 10:1558709. doi: 10.1080/20008198.2018.1558709
15. Ni MY, Kim Y, McDowell I, Wong S, Qiu H, Wong IOL, et al. Mental health during and after protests, riots and revolutions: a systematic review. *Aust N Z J Psychiatry.* (2020) 54:232–43. doi: 10.1177/0004867419899165
16. Jeong H, Yim HW, Song YJ Ki M, Min JA, Cho J, et al. Mental health status of people isolated due to middle east respiratory syndrome. *Epidemiol Health.* (2016) 38:e2016048. doi: 10.4178/epih.e2016048
17. Peng EYC, Lee MB, Tsai ST, Yang CC, Morisky DE, Tsai LT, et al. Population-based post-crisis psychological distress: an example from the SARS outbreak in Taiwan. *J Formos Med Assoc.* (2010) 109:524–32. doi: 10.1016/S0929-6646(10)60087-3
18. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health.* (2020) 17:1729. doi: 10.3390/ijerph17051729
19. Nelson LM, Simard JF, Oluyomi A, Nava V, Rosas LG, Bondy M, et al. US Public concerns about the COVID-19 pandemic from results of a survey given via social media. *JAMA Intern Med.* (2020) 180:1020–22. doi: 10.1001/jamainternmed.2020.1369
20. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. *PLoS ONE.* (2020) 15:e0231924. doi: 10.1371/journal.pone.0231924
21. El-Sayed AM, Scarborough P, Seemann L, Galea S. Social network analysis and agent-based modeling in social epidemiology. *Epidemiol Perspect Innov.* (2012) 9:1. doi: 10.1186/1742-5573-9-1
22. Tracy M, Cerdá M, Keyes KM. Agent-based modeling in public health: current applications and future directions. *Annu Rev Public Health.* (2018) 39:77. doi: 10.1146/annurev-publhealth-040617-014317
23. Cohen GH, Tamrakar S, Lowe S, Sampson L, Ettman C, Linas B, et al. Comparison of simulated treatment and cost-effectiveness of a stepped care case-finding intervention vs usual care for posttraumatic stress disorder after a natural disaster. *JAMA Psychiatry.* (2017) 74:1251. doi: 10.1001/jamapsychiatry.2017.3037
24. Cohen GH, Tamrakar S, Lowe S, Sampson L, Ettman C, Kilpatrick D, et al. Improved social services and the burden of post-traumatic stress disorder among economically vulnerable people after a natural disaster: a modelling study. *Lancet Planet Health.* (2019) 3:e93–101. doi: 10.1016/S2542-5196(19)30012-9
25. US Census Bureau. American Community Survey (ACS) (2019). Available online at: https://www.census.gov/programs-surveys/acs/ (accessed March 28, 2019).
26. Ni MY, Yao XI, Leung KSM, Yau C, Leung CMC, Lun P, et al. Depression and post-traumatic stress during major social unrest in Hong Kong: a 10-year prospective cohort study. *Lancet.* (2020) 395:273–84. doi: 10.1016/S0140-6736(19)33160-5
27. Social Media Usage in the U.S. in 2019. Washington, DC: Pew Research Center (2021). Available online at: https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/ (accessed February 6, 2021).

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

frontiers in Public Health

ORIGINAL RESEARCH
published: 28 March 2022
doi: 10.3389/fpubh.2022.815222

Community-Level Mental Health and Psychosocial Support During Armed Conflict: A Cohort Study From the Democratic Republic of the Congo, Mali, and Nigeria

Ida Andersen[1,2]*, *Rodolfo Rossi*[1] and *Ives Hubloue*[2]

[1] Health Unit, International Committee of the Red Cross, Geneva, Switzerland, [2] Research Group on Emergency and Disaster Medicine, Vrije Universiteit Brussel, Brussels, Belgium

OPEN ACCESS

Edited by:
Jutta Lindert,
University of Applied Sciences Emden Leer, Germany

Reviewed by:
Tanay Maiti,
Black Country Partnership NHS Foundation Trust, United Kingdom
William Ascher,
Claremont McKenna College, United States

***Correspondence:**
Ida Andersen
iandersen@icrc.org

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Public Health

Received: 15 November 2021
Accepted: 17 February 2022
Published: 28 March 2022

Citation:
Andersen I, Rossi R and Hubloue I (2022) Community-Level Mental Health and Psychosocial Support During Armed Conflict: A Cohort Study From the Democratic Republic of the Congo, Mali, and Nigeria. Front. Public Health 10:815222. doi: 10.3389/fpubh.2022.815222

Introduction: Community-level mental health and psychosocial support (MHPSS) was the first type of MHPSS program launched by the International Committee of the Red Cross (ICRC) back in 2004. Standardized beneficiary-level monitoring was put in place in late 2018. This is the first study to explore whether this type of program correlates, as intended, with reduced psychological distress and increased daily functioning.

Methods: Between December 2018 and June 2020, 6,413 victims of violence received MHPSS through 32 community-level projects in the Democratic Republic of the Congo (DRC), Mali and Nigeria. Symptoms of psychological distress (IES-R or DASS21) and daily functioning (ICRC scale) were assessed before and after the intervention and logistical regression models were used to identify predictors of these symptoms.

Findings: Victims of the violence committed by weapon bearers were more likely to show high levels of anxiety prior to MHPSS (aOR 3.51; $p < 0.0001$). Also, victims of physical violence were more likely to show high levels of stress (aOR 1.49; $p < 0.0001$), whereas victims who had witnessed physical violence were more like to report high levels of depression (aOR 2.54; $p < 0.0001$). The most common perpetrators were weapon bearers (76%) and the most common type of violence was rape (46%). Lack of social support stood out as a predictor of both high anxiety (aOR 2.10; $p < 0.0001$) and post-traumatic stress (aOR 2.04; $p < 0.0001$) prior to MHPSS. Following MHPSS, the vast majority of beneficiaries reported a reduction in distress on the DASS21 (96.58%) and the IES-R scales (92.70%) as well as an increase of functioning (82.26%). Adherence to group therapy (seven sessions on average) was stronger than adherence to individual therapy (four sessions on average). A linear trend was found between length of treatment and likelihood of reporting reduced symptoms of depression. Having suffered destruction or loss of property or income predicted less improvement of functioning following MHPSS (aOR 0.90; $p = 0.044$).

Conclusion: Receiving community-level MHPSS is associated with increased wellbeing among the vast majority of beneficiaries. To further enhance the intended health outcomes, it is recommended to increase the length of treatment per beneficiary (30 days minimum) and address, where relevant, the financial consequences of violence. Also, a longitudinal study is recommended to assess longer-term changes in MHPSS symptoms.

Keywords: ICRC, MHPSS, Africa, conflict, sexual violence, red cross red crescent movement

INTRODUCTION

Community-Level MHPSS in the ICRC

For more than 150 years, the International Committee of the Red Cross (ICRC) has offered humanitarian protection and assistance to victims of armed conflict and other situations of violence. Mental health and psychosocial support (MHPSS) is one of the most recent additions to the wide-ranging assistance programs of the ICRC (1) and aims to address the specific MHPSS consequence of violence, including sexual violence.

Community-level MHPSS for victims of violence was the first type of MHPSS program launched by the ICRC. Starting with the *maisons d'écoute* counseling centers in the Democratic Republic of the Congo (DRC) in 2004 (2), similar types of projects are now running in 15 countries worldwide, reaching more than 32,000 direct beneficiaries in 2020 alone.

Community-level MHPSS programs are implemented in collaboration with a local partner such as a local association, non-government organization or the Red Cross Red Crescent National Society. These programs are part of a larger effort to holistically address the needs of victims of violence, which can include health (3), economic security, water and habitat, protection and prevention.

From Monitoring Outputs to Conducting Operational Research

Initially, the monitoring of ICRC MHPSS programs was focused on *outputs* such as "number of training sessions organized." In 2008, the ICRC introduced the results-based management approach (4), which shifted focus to the *outcomes* of each humanitarian project, such as "percentage of participants who improved their knowledge" following training.

The "Framework for monitoring and evaluation of MHPSS programs in emergency settings" (5), published by the Inter-Agency Standing Committee (IASC) in 2017, intensified efforts at a global level to improve and harmonize MHPSS monitoring and evaluation tools. Within the International Red Cross and Red Crescent Movement ("Movement") (6), the International Federation of Red Cross and Red Crescent Societies (IFRC) published a "Monitoring and Evaluation Framework for Psychosocial Support Interventions" (7) in 2017, targeting National Red Cross and Red Crescent Societies.

Similarly, in 2018, the ICRC MHPSS team adopted an electronic case management system with standardized monitoring tools, such as intake forms and psychometric scales, that made it possible to track the evolution of each direct beneficiary before, during and after MHPSS care.

These initiatives lay the foundation for the Movement "Policy on Addressing Mental Health and Psychosocial Needs" (8) adopted during the 33rd International Conference[1] in December 2019. One of the policy's eight statements is devoted to ensuring that MHPSS programs are "informed by evidence," "ensure quality of care" and that the Movement "contributes, where possible, to data collection [and] research."

The present study would not have been possible without this immense work of improving and harmonizing ICRC MHPSS monitoring tools. It aims to walk the talk in terms of carrying out operational research to inform practice and contribute to the evidence base for MHPSS programs in conflict settings.

The MHPSS Pyramid of the International Red Cross and Red Crescent Movement

While the IASC MHPSS pyramid (5) is intended for emergency settings only, the MHPSS Movement pyramid is intended for all contexts in which the Movement works. It contains four different layers (**Figure 1**) (8).

First, *basic psychosocial suppor*t that targets 100% of a population affected by violence and seeks to promote resilience by raising awareness, for example, on common MHPSS consequences of exposure to violence, including sexual violence and locally available services. In the DRC, Mali and Nigeria, partner organizations such as local associations or the National Red Cross Society are trained and supervised by ICRC MHPSS teams to carry out awareness-raising activities in selected areas on themes of relevance to the context.

Second, *focused psychosocial support* aims to prevent the development of more severe mental health consequences of exposure to violence. In Nigeria, the ICRC MHPSS teams train and supervise National Society volunteers to conduct group sessions for victims of violence that include a peer support component in which the participants learn from one another.

Third, *psychological support* is the predominant layer in ICRC MHPSS programs for victims of violence at community level. It addresses the needs of victims of violence that present more severe psychological distress and involves individualized counseling and/or group interventions. In the DRC and Mali, the ICRC MHPSS teams train and supervise partner organizations such as local associations or the National Red Cross Society to assess the unique difficulties of each beneficiary in terms of psychological distress and daily functioning using psychometric tools. A treatment plan is laid down, and the beneficiary is offered

[1]https://rcrcconference.org/about/33rd-international-conference/ (accessed May 23, 2021).

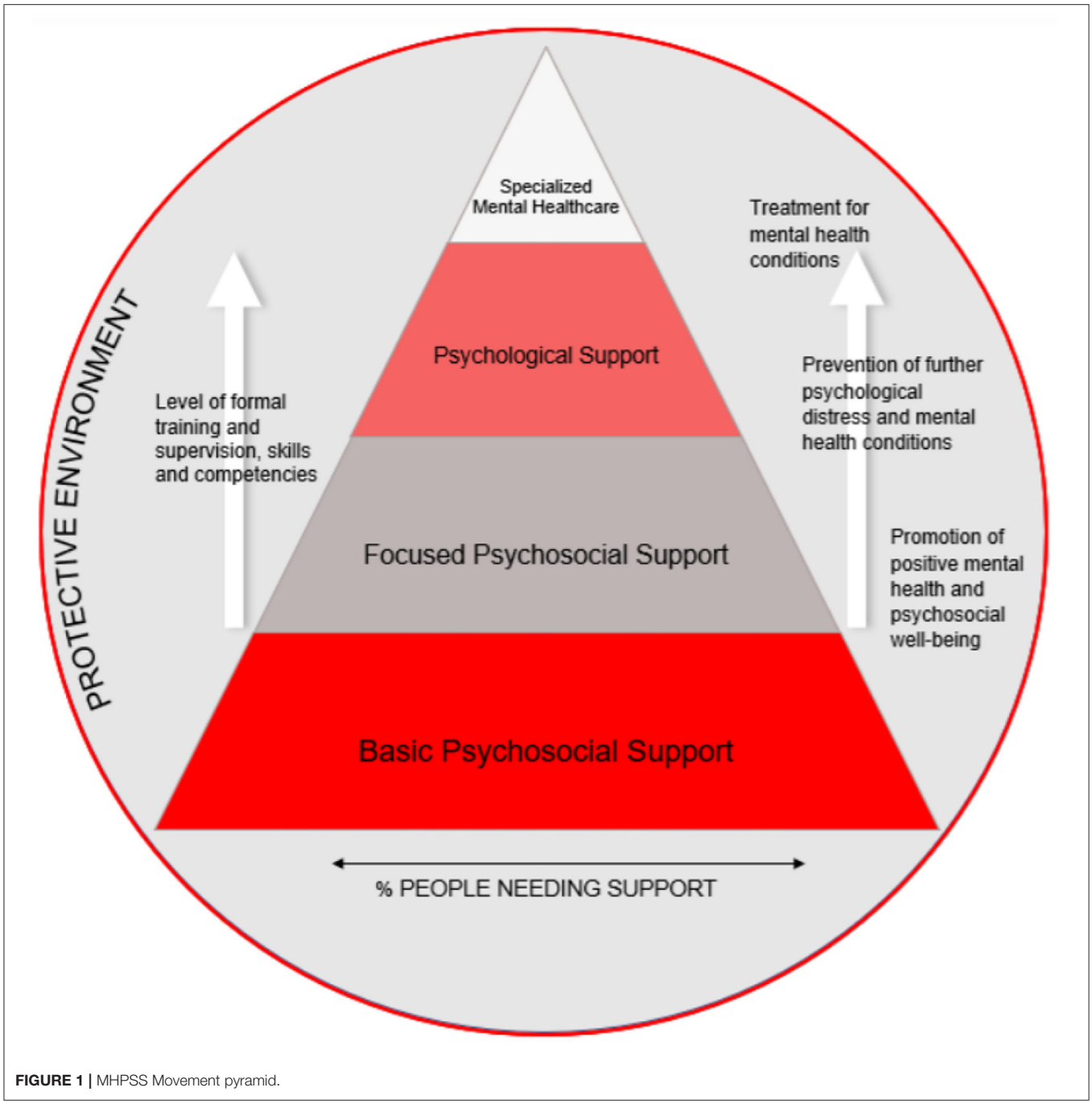

FIGURE 1 | MHPSS Movement pyramid.

individual counseling sessions. In Nigeria, the group sessions offered in collaboration with the Nigerian Red Cross also target the psychological needs of victims of violence and use similar psychometric monitoring tools.

Fourth, *specialized mental health care* involves highly advanced psychological and psychiatric services. In the DRC, Mali and Nigeria, the ICRC does not offer these services directly but aims to refer victims of violence for whom the three lower levels of MHPSS care do not suffice to specialized services available through the Ministries of Health or other actors.

Research Question

In this study, we look specifically at the *psychological support layer* of community-level MHPSS programs by examining the data available from the ICRC's clinical work with victims of violence at community level in the DRC, Mali and Nigeria. The aim is two-fold—first, to identify predictors of high psychological distress and low functioning prior to psychological support and, second, to identify predictors of reduced distress and increased functioning following psychological support.

	IES-R total	DASS21 Depression	DASS21 Anxiety	DASS 21 Stress	ICRC Functioning
Normal	0–23	0–9	0–7	0–14	0–2
Mild	24–32	10–13	8–9	15–18	3–5
Moderate	33–38	14–20	10–14	19–25	6–8
Severe	39–63	21–27	15–19	26–33	9–11
Extremely severe	64–88	29+	20+	34+	12–14

FIGURE 2 | Categorization of IES-R, DASS 21, and ICRC functioning scores used in this study.

METHODS

Study Design

We conducted a non-controlled retrospective cohort study of 6,413 victims of violence who received psychological support between December 2018 and June 2020 through 32 community projects in the DRC, Mali and Nigeria. The data were collected routinely for clinical follow-up and internal monitoring purposes.

Target Population

The target population of ICRC community-level MHPSS programs consisted of civilian men, women, boys and girls directly affected by armed conflict or other situations of violence. According to the ICRC's mandate, these programs were set up in areas where violence is committed mainly by weapon bearers. Thus, they targeted victims of a form of violence that could be considered a breach of IHL, i.e., the principle of distinction that prohibits indiscriminate attacks affecting the civilian population (9).

Psychological support was offered to victims that presented particularly high levels of psychological distress and low functioning as a result of exposure to conflict-related violence.

The Intervention

Pre-assessment

To evaluate the pertinence of offering psychological support and prepare an individualized treatment plan, levels of psychological distress were assessed using either the Depression, Anxiety and Stress Scale with 21 items (DASS21) or the Impact of Events Scale Revised (IES-R). In addition, the ICRC functioning scale was used to estimate the level of daily functioning of each beneficiary (10) (**Figure 2**).

Individual Psychological Support

Victims of violence in the DRC and Mali received individual psychological support by lay counselors called *agents psychosociaux* (APS) who were trained and supervised by the ICRC MHPSS team. As described in a previous publication (11), a short-term solution-oriented approach (11, 12) was adopted to empower the beneficiary to reflect upon and resolve his or her specific problems. In addition to offering psychological support, referrals to local service providers were made according to needs and availability. Some counseling centers could also briefly accommodate victims of violence who lived far from the counseling center, who faced family disputes, stigma or other difficulties that prevented them from returning to their homes.

Group Psychological Support

Victims of violence in Nigeria received group psychological support by ICRC-trained lay counselors working for the Nigerian Red Cross Society (NRCS). After one or several individual preparatory sessions that allowed the counselors to get to know the beneficiaries and group them according to their profiles, 10 group sessions were organized, focusing on the following themes:

I. Introduction
II. Loss and grief
III. Flashbacks and intrusive memories
IV. Sleep and nightmares
V. Anger and irritability
VI. Psychosomatic pain
VII. Guilt and self-blame
VIII. Family problems
IX. Summary
X. Closure an post-evaluations

Each session included a strong psychoeducational component and introduced the participants to adaptive coping skills.

Post-assessments

Following the psychological support, levels of psychological distress and daily functioning were assessed once again, using the same psychometric tools as during the pre-assessment phase.

Dataset

The following variables from the dataset were used in the study:

Demographic Information

Country, gender, age, civil status, resident/migrant/internally displaced, education level, occupation, and number of children.

Type of Violence Experienced

Victim of physical violence (excluding rape, attempted rape, and torture), witness of physical violence, rape, attempted rape, incest, forced marriage, forced prostitution, victim of trafficking/smuggling, kidnapping/hostage taking including sexual violence, kidnapping/hostage taking excluding sexual violence, killing of a loved one, disappearance of a loved one, forced recruitment, torture/ill-treatment, insults/threats, others.

Place of Violence

Home, school/work, on the road/while going somewhere, during combat, while fleeing or in a camp for internally displaced people.

Alleged Perpetrator

Type (partner, family member, known civilian, unknown civilian, military or armed group) and number of perpetrators.

Vulnerability Factors

Destroyed/lost property and/or income, mother head of household, natural death of loved 1 < 2 years ago, natural death of loved 1 more than 2 years ago, parents missing, caretaker neglect, severe or chronic medical/physical condition, severe or chronic mental health condition, suffering from stigma due to an illness, congenital anomaly, marginalization and social discrimination, absence of social support network and forced to flee.

The MHPSS

Timing (number of days between latest violence and first consultation), number of individual sessions received, number of group sessions received and length of support (number of days between pre- and post-assessment).

Pre- and Post-assessments

Levels of psychological distress were measured through the Depression, Anxiety and Stress Scale with 21 items (DASS21) in DRC and Mali, and through the Impact of Event Scale Revised (IES-R) in Nigeria. Daily functioning was measured through the ICRC functionality scale in all countries.

Data Management and Statistical Analysis

All categorical data were numerically coded. Quantitative/continuous variables (i.e., pre- and post-scores) were either kept as such or categorized depending on the type of analysis. Categorization of continuous variables was done either by identifying the median to divide the study participants in two even-sized groups or by using established clinical cut-offs (see Section Dataset).

The dataset was created in Microsoft Excel with two independent data clerks to control for potential typing mistakes. The electronic dataset was protected by a password, which

TABLE 1 | Characteristics of the study population and the MHPSS.

	n	%
Country (*N* = 6,413)		
Democratic Republic of the Congo	5,190	80.93
Mali	184	2.87
Nigeria	1,039	16.20
Gender (*N* = 6,287)		
Male	1,238	19.69
Female	5,049	80.31
Age (*N* = 6,345)		
0–17	550	8.67
18–24	1,178	18.57
25–34	2,172	34.23
35–44	1,450	22.85
45–81	995	15.68
Civil status (*N* = 6,220)		
Single (incl. children)	1,401	22.52
Married	3,601	57.89
Partner abroad	22	0.35
Partner missing	72	1.16
Divorced/Separated	350	5.63
Widow/er	721	11.59
Other	53	0.85
Resident-migrant/IDP status (*N* = 6,104)		
Resident	4,437	72.69
Internally displaced	1,633	27.31
Education level (*N* = 6,190)		
Illiterate	2,023	32.68
Primary	2,402	38.80
Secondary	1,668	26.95
High	97	1.57
Occupation (6,412)		
Unemployed	134	2.09
Student	624	9.73
Farming/cattle	3,160	49.28
Shop/business	1,210	18.87
Other jobs	1,284	20.02
Number of children (*N* = 5,514)		
0	879	15.94
1	305	5.53
2	516	9.36
3	659	11.95
4	723	13.11
5	700	12.69
6	632	11.46
7–20	1,100	19.95
Type of violence experienced (*N* = 6,413)		
Victim of physical violence excluding rape, attempted rape and torture	2,718	42.38
Witness of physical violence	1,352	21.08
Rape	3,937	45.80
Attempted rape	604	10.82
Incest	262	4.09

(Continued)

TABLE 1 | Continued

	n	%
Forced marriage	571	8.90
Forced prostitution	24	0.37
Victim of trafficking/smuggling	28	0.44
Kidnapping/hostage taking including sexual violence	144	2.25
Kidnapping/hostage taking excluding sexual violence	304	4.74
Killing of a loved one	696	10.85
Disappearance of a loved one	356	5.55
Forced recruitment	64	1.00
Torture/Ill-treatment	301	4.69
Insults/threats	246	3.85
Other	447	6.97
Alleged perpetrator (*N* = 6,011)		
Partner	73	1.21
Family member	193	3.21
Known civilian (non-family member)	508	8.45
Unknown civilian	616	10.25
Weapon-bearers	4,564	75.93
No information	57	0.95
Other factors of vulnerability highlighted by the patient during the first session (not mutually exclusive) (*N* = 6,413)		
Destroyed/lost property and/or income	3,879	60.49
Mother head of household	1,900	29.63
Natural death of loved 1 < 2 years ago	776	12.10
Natural death of loved 1 more than 2 years ago	597	9.31
Parents missing	575	8.97
Caretaker neglect	163	2.54
Severe or chronic medical/physical condition	414	6.46
Severe or chronic mental health condition	1,433	22.35
Suffering from stigma due to an illness	26	0.41
Congenital anomaly	62	0.97
Marginalization and social discrimination	146	2.28
Absence of social support network	431	6.72
Forced to flee	206	3.21
Number of perpetrators (*N* = 5,598)		
None	34	0.61
One	1,645	29.39
Several	3,919	70.01
Place of violence (*N* = 6,025)		
Home	2,037	33.81
School/work	897	14.89
On the road/while going somewhere	2,323	38.56
During combat	145	2.41
While fleeing	194	3.22
In an IDP camp	10	0.17
Other	410	6.95
Timing: days between latest violence and first consultation (*N* = 3,322)		
0–2	361	10.87
3–14	991	29.83
15–90	770	23.18
91–365	285	8.58
<365	915	27.54
Number of individual sessions excluding pre- and post-assessments (*N* = 1,319)		
1–2	95	7.20
3–4	741	56.18
5–6	460	34.87
7–10	23	1.74
Number of group sessions excluding pre- and post-assessments (*N* = 691)		
1–2	82	11.87
3–4	82	11.87
5–6	154	22.29
7–12	373	53.98
Length of MHPSS: days between pre- and post-assessment (*N* = 2,268)		
<8	95	4.19
8–14	135	5.95
15–30	561	24.74
31–60	516	22.75
61–90	316	13.93
91–120	343	15.12
121–150	180	7.94
>150	122	5.38

(Continued)

was changed every 3 months. The dataset was transferred to STATA™, version MP 16.0 for analysis.

All quantitative variables were explored by defining their means (and standard deviation), medians and quartiles. Comparisons of means were tested through the *t*-test, and the corresponding *p*-value was reported; 95% confidence intervals (95% CI) were calculated around means and means differences. Categorical variables were explored through percentages and tested using the Chi^2-test to retrieve the corresponding *p*-value; 95% CIs were calculated around these percentages.

To measure associations between pre- and post-scores and the other variables (crude and multivariable), logistic regression models were fitted to calculate odds ratios (OR) with corresponding 95% CIs and *p*-values from the Wald test. All variables were initially explored in a crude model and included in a multivariable model and presented only if statistically significant. We considered as significant *p*-values < 0.05.

FINDINGS

The Study Population

Of the 6,413 victims of violence included in the study, 81% ($N = 6,413$) were from the DRC, 3% from Mali and 16% from Nigeria. As many as 80% were female and the mean age was 32 (**Table 1**). The main types of violence experienced by the patients were rape (46%) and physical violence (42%). The vast majority of the alleged perpetrators weapon-bearers (76%). The most common

TABLE 2 | Distress and functioning categories.

Category	Extreme: *n* (%)	Severe: *n* (%)	Moderate: *n* (%)	Mild: *n* (%)	Normal: *n* (%)
DASS21					
Depression subscale					
Pre-test (*N* = 3,214)	757 (23.55)	836 (26.01)	1,017 (31.64)	317 (9.86)	287 (8.93)
Post-test (*N* = 1,753)	10 (0.57)	17 (0.97)	138 (7.87)	298 (17.00)	1,290 (73.59)
Anxiety subscale					
Pre-test (*N* = 3,335)	1,213 (36.37)	683 (20.48)	828 (24.83)	154 (4.62)	457 (13.70)
Post-test (*N* = 1,753)	25 (1.43)	37 (2.11)	191 (10.90)	171 (9.75)	1,329 (75.81)
Stress subscale					
Pre-test (*N* = 3,335)	91 (2.72)	563 (16.88)	851 (22.52)	642 (19.25)	1,188 (35.62)
Post-test (*N* = 1,753)	0 (0.00)	5 (0.29)	18 (1.03)	60 (3.42)	1,670 (95.27)
IES-R total score					
Pre-test (*N* = 1,216)	201 (16.53)	727 (59.79)	57 (4.69)	52 (4.28)	179 (14.72)
Post-test (*N* = 544)	0 (0.00)	37 (6.80)	37 (6.80)	134 (24.63)	336 (61.76)
ICRC functioning scale					
Pre-test (*N* = 2,446)	140 (5.72)	900 (36.79)	997 (40.76)	321 (13.12)	88 (3.60)
Post-test (*N* = 1,308)	68 (5.20)	58 (4.43)	244 (18.65)	269 (20.57)	669 (51.15)

TABLE 3 | Distress and functioning pre- and post-scores.

	Mean (SD)	95% CI	*p*-value	Range	Med (IQR)	% Who improved
Pre-DASS (*N* = 3,214)	55.66 (20.62)	54.9; 56.38		2–126	56 (42–70)	
Post-DASS (*N* = 1,753)	17.49 (12.68)	16.89; 18.08		2–88	16 (8–24)	
DASS difference (*N* = 1,669)	−36.71 (19.18)	−37.64; −35.79	<0.0001	−86 to 26	−38 (−48 to −24)	96.58
Pre-IES (*N* = 1,216)	46.90 (18.87)	45.86; 47.94		0–84	50 (40–60)	
Post-IES (*N* = 986)	11.30 (13.20)	10.47; 12.12		0–63	20 (11–27)	
IES difference (*N* = 986)	−34.91	−36.12; −33.69	<0.0001	−74 to 26	−37 (−50 – −20)	92.70
Pre-functioning (*N* = 2,447)	6.20 (0.06)	6.09; 6.31		2–14	6 (4–8)	
Post-functioning (*N* = 1,309)	10.47 (0.10)	10.28; 10.67		2–14	12 (8–14)	
Functioning difference (*N* = 1,302)	4.40 (3.66)	4.20; 4.60	<0.0001	−7–12	4 (2–7)	82.26

SD, Standard Deviation; CI, Confidence Interval; p-value derived from the Wald test; IQR, interquartile range.
Inconsistencies arise due to rounding.

place of violence was on the road (39%) and in the victim's home (34%). Additional vulnerability factors mentioned by the patient during the first session included destruction or loss of property or income (60%) and being a mother head of the household (30%).

The MHPSS

The timing of the MHPSS was most commonly 3–14 days following exposure to violence (30%). The most common length of the support was 15–30 days (25%) and 31–60 days (23%). In addition to the first and last sessions consisting of pre- and post-assessments, patients most commonly received 3–4 individual follow-up session (56%). Patients receiving group support attended an average of seven sessions.

Levels of Distress and Functioning Before and After MHPSS

Prior to receiving MHPSS, symptoms categorized as "extreme" were more prevalent for anxiety (36.38%) and depression (22.55%) (**Table 2**).

When comparing pre- and post-assessments, DASS21 scores improved among 96.58% of the patients, IES-R scores improved among 92.70% of the patients and scores on the ICRC functioning scale improved among 82.26% of the patients (**Table 3**).

The largest reduction in symptoms was seen on the IES-R scale with a 75.9% decrease in mean scores. While very few patients presented "extreme" levels of distress following MHPSS, the majority of patients with "extreme" difficulties in functioning at baseline reported equally "extreme" difficulties at closure (**Figure 3**).

Determinants of High Distress and Low Functioning Prior to MHPSS

Depression

On the DASS21 scale, high symptoms of depression at intake were associated with particular types of violence; namely forced recruitment (aOR 7.95; $p = 0.009$), witnessing physical violence (aOR 2.54; $p < 0.0001$) and rape (aOR 1.50; $p <$

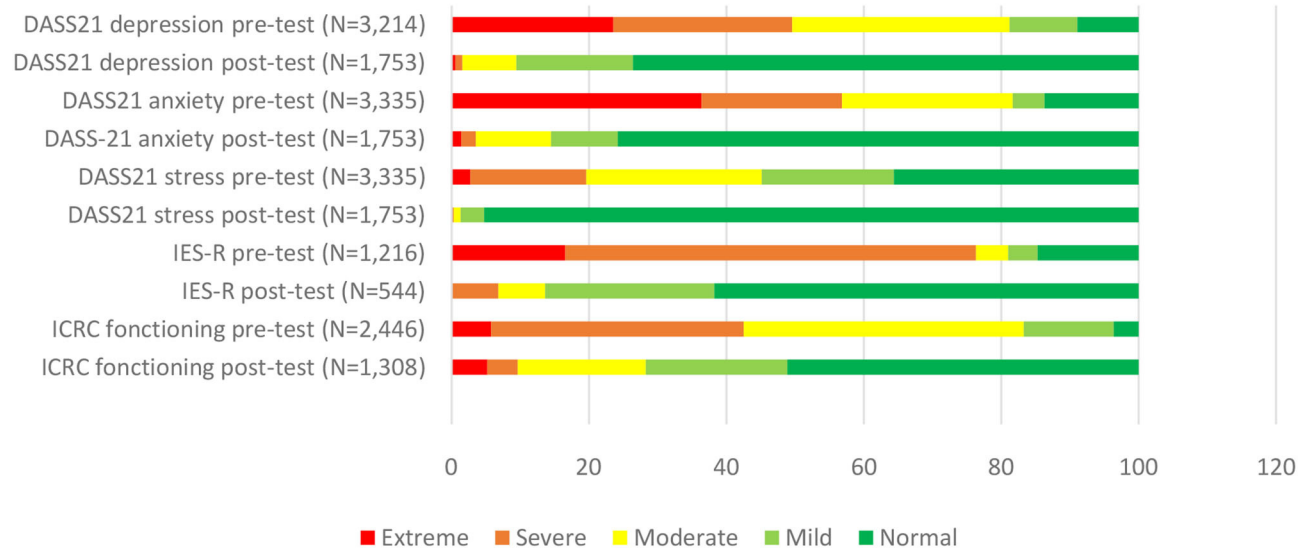

FIGURE 3 | Pre- and post-symptom categories.

0.0001). Experiencing discrimination or stigma also increased the likelihood of patients reporting high levels of depression at intake (aOR 2.38; $p = 0.019$), as did destruction or loss of property and/or income (aOR 1.22; $p = 0.022$). Internally displaced beneficiaries were more likely to report high symptoms of depression at intake (aOR 2.25; $p < 0.0001$) as were patients referred by family or friends (aOR 1.40; $p = 0.023$) (**Table 4**).

Anxiety

Predictors of high anxiety at intake included high stress (aOR 3.87; $p < 0.0001$), high depression (aOR 3.67; $p < 0.0001$) and lack of social support (aOR 2.10; $p < 0.0001$). The profile of the alleged perpetrator of the violence also played a role: compared to victims of violence committed by the patients' partners, the likelihood of reporting high anxiety at intake was more than three times higher among victims of violence committed by the military or armed groups (aOR 3.51; $p = 0.001$) and more than twice as high when the alleged perpetrator was an unknown civilian (aOR 2.76; $p = 0.014$) or a known civilian (aOR 2.45; $p = 0.028$).

Stress

High stress at baseline correlated with reporting high depression (aOR 5.23; $p < 0.0001$) and high anxiety (aOR 3.90; $p \leq 0.0001$). In addition, two types of violence were also strong predictors of high distress: disappearance/abduction of a loved one (aOR 4.04; $p = 0.035$) and having experienced physical violence (aOR 1.49; $p < 0.0001$).

Post-traumatic Stress

Looking at the IES-R scale, a linear trend (aOR 1.19; $p = 0.009$) was found between increasing likelihood of reporting high symptoms at intake and increasing age. Females were more than twice as likely than males to report high symptoms of post-traumatic stress at intake (aOR 2.07; $p < 0.0001$). The likelihood was higher among patients having commenced primary education (aOR 1.48; $p = 0.005$) and even higher among patients having commenced secondary education (aOR 3.38; $p < 0.0001$). Having experienced particular types of violence increased the likelihood of showing high levels of post-traumatic stress at intake, particularly witnessing the killing of a loved one (aOR 1.73; $p < 0.0001$) and witnessing physical violence in general (aOR 1.47; $p = 0.004$).

Functioning

Predictors of low functioning at baseline included high levels of depression (aOR 1.28, $p = 0.010$), having experienced the destruction or loss of property or income (aOR 1.80, $p \leq 0.0001$) and having been a victim of rape (aOR 1.42; $p = 0.001$).

Determinants of Improvement Following MHPSS

Depression

A linear trend was observed between the length of the treatment and the likelihood of reducing symptoms of depression. No such association was observed between length of treatment and other symptom changes. Patients who had experienced the natural death of a loved one more than two years ago were less likely to report reduced depression at closure (aOR 0.26; $p < 0.0001$) (**Table 5**).

Anxiety

Illiterate patients were less likely to report reduced distress following MHPSS compared to patients with a secondary education level (aOR 1.41, $p = 0.036$). Lack of social support, which was a predictor of high anxiety at baseline, was also a

TABLE 4 | Factors associated with high distress and low functioning at baseline.

Variables	cOR (95%CI)	*p*-value	aOR (95%CI)	*p*-value
Depression (DASS21)				
Education level (*N* = 3,117)				
Illiterate	Ref	–	Ref	–
Basic	0.95 (0.80; 1.12)	0.538	0.88 (0.71; 1.08)	0.229
Medium	0.85 (0.71; 1.02)	0.080	0.76 (0.61; 0.95)	0.016
High	0.94 (0.37; 2.39)	0.897	0.93 (0.28; 3.14)	0.912
High anxiety at baseline (*N* = 3,214)				
No	Ref	–	Ref	–
Yes	6.13 (5.24; 7.14)	<0.0001	3.77 (3.13; 4.54)	<0.0001
High stress at baseline (*N* = 3,214)				
No	Ref	–	Ref	–
Yes	7.91 (6.74; 9.28)	<0.0001	5.27 (4.39; 6.32)	<0.0001
Other vulnerability factors (ref = not reported) (*N* = 3,214)				
Destroyed/lost property and/or income	1.35 (1.17; 1.55)	<0.0001	1.22 (1.03; 1.46)	0.022
Experience of discrimination/stigma	2.49 (1.41; 4.41)	0.002	2.38 (1.15; 4.94)	0.019
Referral pathway (*N* = 3,212)				
Self-referred	Ref	–	Ref	–
Referred by family or friends	1.23 (0.98; 1.56)	0.077	1.40 (1.05; 1.87)	0.023
Internally displaced (*N* = 3,119)				
No	Ref	–	Ref	–
Yes	2.29 (1.82; 2.87)	<0.0001	2.25 (1.70; 2.97)	<0.0001
Type of violence experienced (ref = not reported) (*N* = 3,214)				
Forced recruitment	9.77 (2.27; 42.02)	0.002	7.95 (1.69; 37.47)	0.009
Rape	1.20 (1.04; 1.38)	0.011	1.50 (1.25; 1.80)	<0.0001
Witnessing physical violence	1.86 (1.45; 2.38)	<0.0001	2.54 (1.83; 3.52)	<0.0001
Anxiety (DASS21)				
Alleged perpetrator (*N* = 3,213)				
Partner	Ref	–	Ref	–
Family member	1.19 (0.58; 2.46)	0.631	1.51 (0.63; 3.63)	0.356
Known civilian	1.41 (0.73; 2.73)	0.310	2.45 (1.10; 5.48)	0.028
Unknown civilian	1.74 (0.90; 3.38)	0.102	2.76 (1.23; 6.18)	0.014
Military or armed group	2.51 (1.35; 4.69)	0.004	3.51 (1.64; 7.50)	0.001
High depression at baseline (*N* = 3,214)				
No	Ref	–	Ref	–
Yes	6.13 (5.24; 7.17)	<0.0001	3.67 (3.07; 4.39)	<0.0001
High stress at baseline (*N* = 3,335)				
No	Ref	–	Ref	–
Yes	7.11 (6.10; 8.29)	<0.0001	3.87 (3.25; 4.62)	<0.0001
Other vulnerability factors: lack of social support (*N* = 3,335)				
No	Ref	–	Ref	–
Yes	1.77 (1.27; 2.48)	0.001	2.10 (1.39; 3.17)	<0.0001
Stress (DASS21)				
High depression at baseline (*N* = 3,214)				
No	Ref	–	Ref	–
Yes	7.91 (6.74; 9.28)	<0.0001	5.23 (4.41; 6.20)	<0.0001
High anxiety at baseline (*N* = 3,335)				
No	Ref	–	Ref	–
Yes	7.11 (6.09; 8.29)	<0.0001	3.90 (3.29; 4.62)	<0.0001
Type of violence experienced (ref = not reported) (*N* = 3,335)				
Physical violence	1.29 (1.11; 1.49)	0.001	1.49 (1.24; 1.78)	<0.0001
Disappearance/abduction of a loved one	1.68 (0.84; 3.37)	0.145	4.04 (1.10; 14.78)	0.035

(Continued)

TABLE 4 | Continued

Variables	cOR (95%CI)	*p*-value	aOR (95%CI)	*p*-value
Post-traumatic stress (IES-R)				
Age (*N* = 1,210)				
0–17	Ref	–	Ref	–
18–24	5.29 (1.14; 24.59)	0.033	5.61 (1.14; 27.50)	0.034
25–34	7.93 (1.79; 35.17)	0.006	8.91 (1.91; 41.59)	0.005
35–44	8.64 (1.95; 38.32)	0.005	9.59 (2.05; 44.81)	0.004
45–81	6.81 (1.54; 30.23)	0.012	9.72 (2.07; 45.56)	0.004
Gender (*N* = 1,214)				
Male	Ref	–	Ref	–
Female	1.86 (1.43; 2.42)	<0.0001	2.07 (1.60; 2.94)	<0.0001
Education level (*N* = 1,160)				
Illiterate	Ref	–	Ref	–
Basic	1.44 (1.11; 1.85)	0.006	1.48 (1.12; 1.94)	0.005
Medium	3.15 (1.95; 5.08)	<0.001	3.38 (2.03; 5.64)	<0.0001
High	1.65 (0.95; 2.89)	0.078	1.78 (0.98; 3.24)	0.060
Other vulnerability factors (ref = not reported) (*N* = 1,216)				
Lack of social support	2.60 (1.69; 3.99)	<0.0001	2.04 (1.29; 3.22)	0.002
Type of violence experienced (ref = not reported) (*N* = 1,216)				
Killing of a loved one	2.15 (1.71; 2.71)	<0.0001	1.73 (1.35; 2.22)	<0.0001
Witness to physical violence	1.69 (1.27; 2.25)	<0.0001	1.47 (1.13; 1.91)	0.004
Functioning (ICRC Africa scale)				
High depression at baseline (*N* = 1,902)				
No	Ref	–	Ref	–
Yes	1.31 (1.09; 1.57)	0.004	1.28 (1.06; 1.54)	0.010
Other vulnerability factors (ref = not reported) (*N* = 2,447)				
Destroyed/lost property and/or income	1.77 (1.51; 2.09)	<0.0001	1.80 (1.50; 2.17)	<0.0001
Type of violence experienced (ref = not reported) (*N* = 2,447)				
Rape	1.05 (0.89; 1.25)	0.540	1.42 (1.16; 1.74)	0.001

cOR, crude odds ratio; aOR, adjusted odds ratio; p-value from Wald test; DASS21 depression cut-off: 20; DASS21 Anxiety cut-off: 16; DASS21 Stress cut-off: 18; IES-R cut-off: 51; Functioning cut-off: 5.

predictor of changes in levels or anxiety following MHPSS. Thus, compared to patients who did not report lacking social support, patients who did report lacking social support were three times less likely to show a large reduction in symptoms of anxiety following MHPSS (aOR 0.27; $p < 0.0001$).

Stress

A linear trend was observed between the likelihood of showing a large reduction in symptoms of stress and the patient's education level (OR 1.17; $p = 0.011$). Patients that lacked social support were less than half as likely to show reduced stress at closure (aOR 0.49; $p = 0.006$) as were patients who had experienced the natural death of a loved $1 < 2$ years ago (aOR 0.46; $p < 0.0001$).

Post-traumatic Stress

On the IES-R scale, 92.70% of the patients showed a reduction in symptoms following MHPSS. Experiencing discrimination, stigma and/or marginalization correlated with a smaller or no reduction in symptoms of post-traumatic stress (aOR 0.23; $p = 0.037$).

Functioning

A linear trend was found between an increasing number of children and an increasing likelihood of improving daily functioning (aOR 1.05; $p = 0.042$). Also, patients who improved functioning the most were less likely than other patients to have experienced a destruction or loss of property and/or income (aOR 0.90; $p = 0.044$).

Individual vs. Group Sessions

No significant differences were found with regard to reduced distress or increased functioning following individual vs. group sessions. However, whereas the average length of individual psychological support was 49 days, the average length of group psychological support was 131 days. Also, the drop-out rate was lower among beneficiaries of group psychological support in that 61.25% completed the sessions with a post-assessment compared to only 43.58% among beneficiaries of individual psychological support.

DISCUSSION

The various factors correlating with particular levels of symptoms before and after MHPSS can be divided into four sets of

TABLE 5 | Factors associated with improved distress and functioning following MHPSS.

Variables	cOR (95%CI)	*p*-value	aOR (95%CI)	*p*-value
Depression (DASS21)				
High depression at baseline (*N* = 1,669)				
No	Ref	–	Ref	–
Yes	15.13 (11.92; 19.20)	<0.0001	12.72 (9.57; 16.90)	<0.0001
Large improvement in symptoms of anxiety (*N* = 1,669)				
No	Ref	–	Ref	–
Yes	5.06 (4.11; 6.24)	<0.0001	2.42 (1.82; 3.22)	<0.0001
Large improvement in symptoms of stress (*N* = 1,669)				
No	Ref	–	Ref	–
Yes	6.08 (4.92; 7.52)	<0.0001	2.71 (2.05; 3.60)	<0.0001
Other vulnerability factors: natural death of loved 1 more than 2 years ago (*N* = 1,669)				
No	Ref	–	Ref	–
Yes	0.51 (0.36; 0.74)	<0.0001	0.26 (0.16; 0.43)	<0.0001
Length of MHPSS: days between pre- and post-assessment (*N* = 1,552)				
<8	Ref	–	Ref	–
8–14	1.91 (0.96; 3.78)	0.063	1.29 (0.54; 3.06)	0.561
15–30	4.90 (2.70; 8.89)	<0.0001	1.93 (0.90; 4.12)	0.089
31–60	3.23 (1.77; 5.88)	<0.0001	3.10 (1.46; 6.58)	0.003
61–90	2.99 (1.61; 5.54)	0.001	3.46 (1.59; 7.52)	0.002
91–120	3.52 (1.80; 6.85)	<0.0001	3.66 (1.57; 8.50)	0.003
121–150	3.66 (1.55; 8.65)	0.003	2.77 (0.92; 8.33)	0.071
>150	3.48 (1.48; 8.17)	0.004	2.04 (0.70; 5.97)	0.193
Anxiety (DASS21)				
High anxiety at baseline (*N* = 1,669)				
No	Ref	–	Ref	–
Yes	17.28 (13.49; 22.12)	<0.0001	18.73 (14.42; 24.34)	<0.0001
Education level (*N* = 1,616)				
Illiterate	Ref	–	Ref	–
Basic	1.10 (0.86; 1.40)	0.454	0.99 (0.73; 1.36)	0.972
Medium	1.33 (1.03; 1.71)	0.026	1.41 (1.02; 1.94)	0.036
High	1.66 (0.58; 4.74)	0.345	1.22 (0.33; 4.52)	0.771
Other vulnerability factors: lack of social support (*N* = 1,669)				
No	Ref	–	Ref	–
Yes	0.59 (0.38; 0.91)	0.018	0.27 (0.16; 0.45)	<0.0001
Stress (DASS21)				
High stress at baseline (*N* = 1,669)				
No	Ref	–	Ref	–
Yes	21.48 (16.46; 28.03)	<0.0001	25.85 (19.47; 34.33)	<0.0001
Education level (*N* = 1,616)				
Illiterate	Ref	–	Ref	–
Basic	1.01 (0.79; 1.30)	0.919	1.14 (0.83; 1.56)	0.429
Medium	1.32 (1.03; 1.70)	0.029	1.65 (1.19; 2.30)	0.003
High	2.47 (0.83; 7.34)	0.104	4.15 (1.05; 16.41)	0.042
Other vulnerability factors (ref = not reported) (*N* = 1,616)				
Lack of social support	0.88 (0.57; 1.35)	0.548	0.49 (0.28; 0.81)	0.006
Natural death of loved 1 < 2 years ago	0.74 (0.54; 1.01)	0.054	0.46 (0.31; 0.68)	<0.0001
Post-traumatic stress (IES-R)				
High post-traumatic stress at baseline (*N* = 544)				
No	Ref	–	Ref	–

(Continued)

TABLE 5 | Continued

Variables	cOR (95%CI)	*p*-value	aOR (95%CI)	*p*-value
Yes	2.80 (1.98; 3.97)	<0.0001	1.55 (1.03; 2.33)	0.035
Internally displaced (*N* = 468)				
No	Ref	–	Ref	–
Yes	4.65 (2.18; 9.89)	<0.0001	4.02 (1.84; 8.80)	<0.0001
Experience of discrimination/stigma/marginalization				
No	Ref	–	Ref	–
Yes	0.38 (0.10; 1.47)	0.161	0.23 (0.06; 0.92)	0.037
Occupation				
Unemployed	Ref	–	Ref	–
Shop or business owner	0.16 (0.06; 0.46)	0.001	0.32 (0.11; 0.95)	0.040
Functioning (ICRC Africa scale)				
Low functioning prior to MHPSS (*N* = 1,302)				
No	Ref	–	Ref	–
Yes	1.92 (1.53; 2.40)	<0.0001	1.92 (1.51; 2.44)	<0.0001
Number of children (*N* = 1,171)	1.05 (1.00; 1.10)	0.033	1.05 (1.00; 1.10)	0.042
Other vulnerability factors: destroyed/lost property and/or income (*N* = 1,302)				
No	Ref	–	Ref	–
Yes	0.87 (0.69; 1.08)	0.199	0.90 (0.71; 1.15)	0.044

cOR, crude odds ratio; aOR, adjusted odds ratio; p-value from Wald test; DASS21 depression cut-off: −14; DASS21 Anxiety cut-off: −12; DASS21 Stress cut-off: −12; IES-R cut-off: −37; Functioning cut-off: 4.

determinants related to the beneficiary, the violence experienced, other vulnerability factors and the psychological support received (**Figure 4**).

Determinants Related to the Beneficiary

Illiteracy stood out as a strong predictor of high levels of depression. One meta-analysis found a similar association between low socioeconomic status (SES) and an increased likelihood of depression, explained by both causation (low SES increases risk of depression) and selection (depression hinders social mobility). The authors speculated that people of higher socio-economic status (SES) may have more personal resources such as coping mechanisms and self-esteem that can buffer the impact of exposure to violence and stress on depression (13). Testing this hypothesis among beneficiaries of ICRC community-level MHPSS programs would require assessing such personal resources more thoroughly. Following the psychological support, illiterate patients were also less likely to report large reductions in their levels of anxiety and stress. The fact that the better educated beneficiaries improved significantly more on these parameters could indicate that the psychological support, in its current form, contributes to favoring the better educated patients. Thus, it would seem relevant to review the current approach to ensure that illiterate patients receive appropriate psychological support to address anxiety and stress in particular.

Internal displacement also correlated with increased likelihood of high depression at baseline. A recent meta-analysis confirmed a link between internal displacement and depression rates of up to 80% (14). The fact that internal displacement did not influence the outcome of the psychological support suggests that the counseling in its current form adequately addresses the needs of this sub-group of beneficiaries.

The referral pathway played a role in that beneficiaries *referred by family members or friends* were more likely to present high symptoms of depression at baseline. This suggests that people with the most severe levels of depression are less likely to proactively seek care by themselves and that identifying these beneficiaries through their family and friends is essential to ensuring that they gain access to psychological support. This finding should be taken into consideration when setting down strategies for awareness-raising. Such activities should target not only potential beneficiaries, but also members of the community who may not need MHPSS services themselves but who can help to identify vulnerable people in their network in need of this type of support.

High levels of post-traumatic stress were associated with *increasing age, primary and secondary education level* and *female gender*. While the first two are not consistent with findings of other studies (13, 15), the correlation between female gender and increased likelihood of post-traumatic stress disorder (PTSD), including prolonged duration of PTSD, has been shown both in Western (16) and Africa (17) populations.

Unexpectedly, the *more children* the beneficiary had, the more likely he or she was to show increased functioning following psychological support. The authors are not aware of any studies documenting such an association. It is likely that having more children to take care of pushes the beneficiary out of ruminations and back to doing what is necessary, i.e., functioning. Also, one of the elements of the psychological support is to mobilize one's network (including children) to increase practical and emotional

	Symptom clusters				
	Depression*	**Anxiety***	**Stress***	**PTSD***	**Functioning****
The beneficiary					
Age *(increasing)*				↑ pre	
Basic or medium education level				↑ pre	
Female gender				↑ pre	
Illiteracy	↑ pre	↓post	↓post		
Internally displaced	↑ pre				
Number of children *(increasing)*					↑ post
Referred by family or friends	↑ pre				
Violence experienced					
Forced recruitment	↑ pre				
Killing of a loved one				↑ pre	
Perpetrator military/ armed group		↑ pre			
Physical violence			↑ pre		
Rape	↑ pre				↓ pre
Witnessing physical violence	↑ pre			↑ pre	
Other vulnerability factors					
Destruction/loss property/income	↑ pre				↓pre ↓post
Disappearance of a loved one			↑ pre		
Discrimination/stigma				↓post	
Natural death of a loved one	↓post		↓ post		
Lack of social support		↑pre↓post	↓post	↑ pre	
MHPSS received					
Treatment length *(1–4 months vs >7 days)*	↓ post				

↑ pre = More likely to show high levels prior to MHPSS, ↓pre = Less likely to show high levels prior to MHPSS
↑ post = More likely to show improvement after MHPSS, ↓ post = Less likely to show improvement after MHPSS

FIGURE 4 | Summary of the main determinants.

support. This may have helped some beneficiaries to more easily carry out everyday tasks.

Determinants Related to the Violence Experienced

High symptoms of depression correlated with having experienced *forced recruitment*, *rape* or w*itnessing physical violence*. A study of former child soldiers in Uganda found depression to be the most dominant mental health disorder with a prevalence rate of 36% (18). A systematic review found forced recruitment to increase the risk of both depression and PTSD, despite variations in prevalence rates depending on the methodology used in the various studies (19).

Consistent with the association between rape and increased likelihood of high symptoms of depression, a systematic review (20) found prevalence rates of depression of up to 76% among victims of sexual violence in conflict settings. The fact that rape also correlated with low functioning prior to receiving psychological support points to the very tangible consequences that this grave form of sexual violence has on the life of the victims.

Furthermore, consistent with the association between witnessing of physical violence and increased likelihood of high symptoms of depression, a study from a non-humanitarian setting found that witnessing community violence, without ever being a direct victim of physical violence, more than doubled the likelihood of depression (21).

The profile of the perpetrator as weapon bearer vs. civilian matters not only in terms of the ICRC mandate (22), but also in terms of predicting high levels of anxiety among victims of violence. Indeed, addressing the psychological needs of victims of the violence committed by a member of the military or an armed group with, for example a generalized fear of men in uniforms, differs from addressing the psychological needs of, for example, a victim of domestic violence.

These types of violence correlated with the levels of certain symptoms prior to—but not following—psychological support. This indicates that while counselors should be attentive to certain types of violence causing particular psychological needs, by and large the psychological support in its current form does not overlook the needs of beneficiaries having experienced particular types of violence.

Determinants Related to Other Vulnerability Factors

Disappearance of a loved one predicted high levels of stress prior to psychological support. The link between having a missing relative and experiencing psychological distress has been documented in a previous study of ICRC MHPSS programs (23). Likewise, social *stigma* was a predictor of depression. One study found that stigma has been identified as a mediator between sexual violence and depression in the DRC (24).

Three predictors of high distress and low functioning both before and after receiving psychological support stood out repeatedly (see **Figure 2**): *lack of social support, grief* and *acute financial needs* resulting from destruction or loss of property or income. These findings suggest that beneficiaries presenting these additional vulnerability factors benefit less from the psychological support that they receive. Consequently, when relevant, the counseling should focus on expanding the network of beneficiaries with limited or no social support, and counselors should be attentive to beneficiaries experiencing grief even when caused by factors unrelated to the armed conflict. Also, for beneficiaries with acute financial needs resulting from exposure to violence, psychological support alone does not suffice. For this sub-group of beneficiaries, MHPSS outcomes such as reduced psychological distress cannot be achieved unless financial needs are addressed in parallel with the psychological support.

Determinants Related to the MHPSS Received

The only determinant of improvement that was related to the MHPSS received was the *length* of the psychological support, which can also be explained simply by the passage of time. No significant difference in improvement was found between beneficiaries receiving individual and group psychological support *per se*, although group support tended to last almost three times longer than individual support. Thus, increasing the length of the psychological support, particularly for the individual support, should be prioritized to ensure that beneficiaries profit as much as possible. This is particularly challenging in conflict settings characterized by limited access and internal displacement.

However, if the aim is truly to make a difference by reducing the psychological distress and increasing the daily functioning of victims of violence, then the barriers to longer-term psychological support must be further examined and addressed. Even from a strict cost-benefit perspective, having already invested in having specialized MHPSS teams on the ground, organizing training sessions and supervisions, paying incentives etc., it would make sense to try to understand and address the barriers to longer-term treatment adherence more thoroughly.

Strengths and Limitations

This study was made possible by the extensive monitoring system of ICRC MHPSS programs. The real-life settings, the uniqueness of the data and the large number of beneficiaries involved constitute major strengths of this study. Furthermore, the quality of the data derived from standardized psychometric tools and following each individual patient before and after MHPSS can be considered as important attributes.

The main limitation of this study is the absence of a control group. It is not possible to state whether the changes in distress levels were due to the intervention or other reasons, even if the experience of violence preceded the MHPSS intervention. Thus, the study does not claim to have identified causal relationships, only associations.

Another limitation is the fact that all the data used in the study stems from information obtained from the patient him or herself; this may have introduced information bias and possible misclassification. Finally, despite the various variables used to construct the regression models, residual confounding cannot be ruled out.

CONCLUSION

Supplemented by MHPSS projects integrated into primary health care, hospitals, physical rehabilitation centers and other structures, community-level projects remain a pertinent entry point for reaching the broader civilian population affected by armed conflict and other violence.

The main operational recommendations deriving from this study can be summarized as follows:

- Using qualitative methods, explore the link between illiteracy and reduced likelihood of improvement in anxiety and stress following MHPSS.
- Where relevant, ensure greater adaptation of the psychological support to beneficiaries with a low education level.
- Address *grief* by reinforcing the technical capacity of the counselors on this topic.
- Address *lack of social support* more proactively by enhancing, when relevant, the beneficiary's support network.
- Ensure that acute financial needs resulting from violence are addressed alongside the psychological needs.
- Examine and address barriers to adherence to treatment, particularly for individual psychological support, to increase the number of follow-up sessions per patient. Explore the pertinence of reimbursing transportation costs and/or introducing more home visits.

- Monitor the content of the psychological support, i.e., techniques used and themes discussed, to be able to pinpoint and reinforce the specific aspects that correlate with improvement.
- Monitor and analyze to what extent interventions at lower levels of the pyramid prevent or otherwise influence the needs at the psychological support layer.
- Monitor and analyze to what extent referrals to other service providers influence psychological and other outcomes.
- Conduct a longitudinal study to assess the longer-term levels of distress and functioning following MHPSS.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Medical Ethics Committee of the Free University of Brussels (VUB) in Brussels, Belgium (B.U.N. 143201942389). The data were not initially collected for research purposes, but as part of the routine monitoring of the ICRC MHPSS sub-unit. Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

RR conceived and designed the analysis. IA compiled the data, performed the analysis, and wrote the paper. IA and RR contributed data or analysis tools. RR and IH commented and validated the final draft. All authors contributed to the article and approved the submitted version.

FUNDING

This study was carried out within the framework of the International Doctoral Programme in Global Health, Humanitarian Aid and Disaster Management offered jointly by the Center for Research and Training in Disaster Medicine (CRIMEDIM) at the University Piémonte Orientale (UPO) and the Research Group on Emergency and Disaster Medicine (ReGEDiM) at the Vrije Universiteit Brussel (VUB).

ACKNOWLEDGMENTS

The authors wish to thank the entire ICRC MHPSS team and their partners.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2022.815222/full#supplementary-material

REFERENCES

1. Discover the ICRC – Assistance. *Geneva: International Committee of the Red Cross*. (2021). Available online at: https://app.icrc.org/discover-icrc/5-assistance.html (accessed June 18, 2021).
2. *Violences sexuelles au Congo (RDC): les victimes sur le banc des accusés*. Geneva: International Committee of the Red Cross (2007). Available online at: https://www.icrc.org/fr/doc/resources/documents/interview/congo-kinshasa-interview-191207.htm (accessed June 18, 2021).
3. World Health Organization. *Clinical Management of Rape and Intimate Partner Violence Survivors: Developing Protocols for Use in Humanitarian Settings*. Geneva: World Health Organization (2020).
4. *Programme/Project Management: The Results-Based Approach*. Geneva: International Committee of the Red Cross (2008). Available online at: https://www.icrc.org/en/doc/resources/documents/publication/p0951.htm accessed on 22.05.2021 (accessed June 18, 2021).
5. Inter-Agency Standing Committee (IASC) Reference Group for Mental Health and Psychosocial Support in Emergency Settings. *A Common Monitoring and Evaluation Framework for Mental Health and Psychosocial Support Programmes in Emergency Settings*. Geneva: IASC (2017).
6. *The International Red Cross and Red Crescent Movement*. Geneva: International Committee of the Red Cross (2021). Available online at: https://www.icrc.org/en/who-we-are/movement (accessed June 18, 2021).
7. International Federation of Red Cross and Red Crescent Societies (IFRC) Reference Centre for Psychosocial Support (PS Centre). *Monitoring and Evaluation Framework for Psychosocial Support Interventions*. Copenhagen: IFRC PS Centre (2017).
8. International Committee of the Red Cross. *International Red Cross and Red Crescent Movement Policy on Addressing Mental Health and Psychosocial Needs*. Geneva: RCRC Movement (2019).
9. *Glossary: Distinction*. Geneva: International Committee of the Red Cross (2021). Available online at: https://casebook.icrc.org/glossary/distinction (accessed May 24, 2021).
10. Andersen I, Rossi R, Yabutu MNM, Hubloue I. Integrating mental health and psychosocial support into health facilities in conflict settings: a retrospective review from six african countries. *Front Public Health.* (2020) 8:892. doi: 10.3389/fpubh.2020.591369
11. Kim J, Jordan SS, Franklin C, Froerer A. Is solution-focused brief therapy evidence-based? An update 10 years later. *Fam Soc.* (2019) 100:127–38. doi: 10.1177/1044389419841688
12. Yakup IME. Solution-focused brief therapy and spirituality. *Spirit Psychol Counsel.* (2019) 4:143–61. doi: 10.37898/spc.2019.4.2.0065
13. Lorant V, Deliège D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression: a meta-analysis. *Am J Epidemiol.* (2003) 157:98–112. doi: 10.1093/aje/kwf182
14. Morina N, Akhtar A, Barth J, Schnyder U. Psychiatric disorders in refugees and internally displaced persons after forced displacement: a systematic review. *Front Psychiatry.* (2018) 9:433. doi: 10.3389/fpsyt.2018.00433
15. Charlson FJ, Flaxman A, Ferrari AJ, Vos T, Steel Z, Whiteford HA. Post-traumatic stress disorder and major depression in conflict-affected populations: an epidemiological model and predictor analysis. *Glob Ment Health.* (2016) 3:E4. doi: 10.1017/gmh.2015.26
16. Luxton DD, Skopp NA, Maguen S. Gender differences in depression and PTSD symptoms following combat exposure. *Depress Anxiety.* (2010) 27:1027–33. doi: 10.1002/da.20730
17. Mpembi MN, Lukeba T, Mayemba D, Massamba VK, ma Nzuzi TM, Gokara S, et al. États de stress en consultation externe à l'hôpital général de Bangui dans un contexte de conflit armé: étude transversale descriptive. *Pan Afr Med J.* (2018) 29:1–7. doi: 10.11604/pamj.2018.29.26.7107

18. Klasen F, Oettingen G, Daniels J, Adam H. Multiple trauma and mental health in former Ugandan child soldiers. *J Trauma Stress.* (2010) 23:573–81. doi: 10.1002/jts.20557
19. Betancourt TS, Borisova I, Williams TP, Meyers-Ohki SE, Rubin-Smith JE, Annan J, et al. Research review: psychosocial adjustment and mental health in former child soldiers–a systematic review of the literature and recommendations for future research. *J Child Psychol Psychiatry.* (2013) 54:17–36. doi: 10.1111/j.1469-7610.2012.02620.x
20. Ba I, Bhopal RS. Physical, mental and social consequences in civilians who have experienced war-related sexual violence: a systematic review (1981–2014). *Public Health.* (2017) 142:121–35. doi: 10.1016/j.puhe.2016.07.019
21. Clark C, Ryan L, Kawachi I, Canner MJ, Berkman L, Wright RJ. Witnessing community violence in residential neighborhoods: a mental health hazard for urban women. *J Urban Health.* (2008) 85:22–38. doi: 10.1007/s11524-007-9229-8
22. Mandate and mission. *Geneva: International Committee of the Red Cross.* (2021). Available online at: https://www.icrc.org/en/mandate-and-mission (accessed May 5, 2021).
23. Andersen I, Poudyal B, Abeypala A, Uriarte C, Rossi R. Mental health and psychosocial support for families of missing persons in Sri Lanka: a retrospective cohort study. *Confl Health.* (2020) 14:120pe doi: 10.1186/s13031-020-00266-0
24. Verelst A, De Schryver M, De Haene L, Broekaert E, Derluyn I. The mediating role of stigmatization in the mental health of adolescent victims of sexual violence in Eastern Congo. *Child Abuse Negl.* (2014) 38:1139–46. doi: 10.1016/j.chiabu.2014.04.003

Author Disclaimer: The views expressed are those of the authors and do not necessarily represent the views, policies or decisions of their employers.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

frontiers | Frontiers in Public Health

ORIGINAL RESEARCH
published: 09 June 2022
doi: 10.3389/fpubh.2022.821881

Robbery Victimization in Early Adulthood, and Depression and Anxiety at Age 30 Years: Results From the 1982 Pelotas (Brazil) Birth Cohort Study

Jesem Douglas Yamall Orellana[1]*, *Joseph Murray*[2,3], *Natália Peixoto Lima*[2,4], *Ricardo Tavares Pinheiro*[4] and *Bernardo Lessa Horta*[2]

[1] Research Support Unit, Leônidas and Maria Deane Institut, Oswaldo Cruz Foundation, Manaus, Brazil, [2] Postgraduate Program in Epidemiology, Federal University of Pelotas, Pelotas, Brazil, [3] Human Development and Violence Research Centre, Federal University of Pelotas, Pelotas, Brazil, [4] Postgraduate Program in Health and Behavior, Catholic University of Pelotas, Pelotas, Brazil

OPEN ACCESS

Edited by:
Jutta Lindert,
University of Applied Sciences Emden Leer, Germany

Reviewed by:
Claudia De Souza Lopes,
Rio de Janeiro State University, Brazil
Moshe Z. Abramowitz,
Peres Academic Center, Israel
Ewa Domaradzka,
Institute of Psychology (PAN), Poland

***Correspondence:**
Jesem Douglas Yamall Orellana
jesem.orellana@fiocruz.br

Specialty section:
This article was submitted to Public Mental Health, a section of the journal Frontiers in Public Health

Received: 24 November 2021
Accepted: 17 May 2022
Published: 09 June 2022

Citation:
Orellana JDY, Murray J, Lima NP, Pinheiro RT and Horta BL (2022) Robbery Victimization in Early Adulthood, and Depression and Anxiety at Age 30 Years: Results From the 1982 Pelotas (Brazil) Birth Cohort Study. Front. Public Health 10:821881. doi: 10.3389/fpubh.2022.821881

Robbery is one of the most common urban crimes, but little is known about its relationship with mental disorders in young adults. This study aimed to assess the relationship between robbery victimization and Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD) and comorbidity between MDD and GAD at 30 years of age. A birth cohort study has followed all children born in the city of Pelotas, southern Brazil, since 1982. At ages 23 and 30 years, participants were interviewed and asked about lifetime and recent experiences of robbery. Covariates were measured in interviews between birth and age 30 years. MDD and GAD were measured using the MINI-International Neuropsychiatric Interview. Adjusted prevalence ratio (aPR) and corresponding 95% confidence interval (CI) for associations between robbery and mental disorders were calculated using Poisson regression with robust standard error. Of 3,701 cohort members interviewed at age 30 years, 42% reported robbery victimization during their lifetime. Victimization across three periods (lifetime, past 10 years, past 12 months) was associated with increased occurrence of MDD, GAD, as well as the MDD and GAD comorbidity. The strongest associations were found to robbery occurring in the previous 12 months with the MDD and GAD comorbidity, both for burglary at home (aPR 2.52; 95% CI 1.52–4.22) or community family victimization (aPR 2.10; 95% CI 1.34–3.27). These findings highlight the importance of community violence for mental health in young adulthood, and the need for public policies to prevent violence as well as support services for victims to mitigate its adverse health consequences.

Keywords: violence, middle-income country, mental disorders, crime victims, cohort studies, Brazil, urban populations

INTRODUCTION

Mental disorders, mainly anxiety and depression are an important global public health problem (1); 10.5% of the burden of disease in Latin America and Caribbean is due to mental and behavioral disorders (2). In three Brazilian birth cohorts (Ribeirão Preto, São Luís and Pelotas), the prevalence of depression was higher than 7% and generalized anxiety was over 9% among adults aged from 22 to 39 years (3).

Several studies have shown that mental disorders in adulthood have roots in exposure to stressful events in childhood or adolescence, such as child maltreatment, neglect, domestic violence, physical abuse, bullying, familial members death and contexts affected by war or armed conflict (4–9). In adults, post-traumatic stress disorder related to experiences of robbery has been reported among convenience store and bank employees (10–12). Moreover, depression, anxiety and social phobia have been found to correlate with community violence (9, 13). High rates of violence in Latin America may be an important cause of mental disorder in the region (14). For example, a survey of adults in Rio de Janeiro and São Paulo reported that about one in every ten subjects had experienced traumatic experiences, especially those involving interpersonal violence in the last 12 months, which was strongly related to several mental disorders (15).

Robbery is one of the most important forms of exposure to community violence (16–20), and a previous study carried out in Pelotas found that robbery victimization was associated with depression and anxiety among adolescents (19), in line with other studies performed in high-income countries, such as United States and England (21, 22). There is, hence, a substantial set of findings from studies highlighting that community violence, mainly robbery victimization, may be related to mental disorders at different stages in the lifecourse, since robbery victims often report not only feelings of fear and concerns immediately afterwards the victimization, but also apprehension with possible revictimization and mental disorders occurrence, such as major depression and generalized anxiety, even months or years later, for example (13, 23–25).

Although several studies has already been evaluated the association between stressful life events or interpersonal/community violence and mental disorders (7, 13, 15), there is no studies that has evaluated the robbery exposure at different times in the life course (lifetime, in the last 10 years, in the last 12 months) with specific mental disorders, such as major depression, generalized anxiety and the MDD and GAD comorbidity at age 30. In its most general form, our hypothesis is that the robbery victimization is associated with mental disorders at different stages in the life course. Therefore, this study was aimed at assessing the relationship between robbery victimization and mental disorders at 30 years in a Brazilian town with high rate of violence.

MATERIALS AND METHODS

Study Designs and Participants

In 1982, all maternity hospitals in Pelotas, a southern Brazilian city, were daily visited and births identified. Those livebirths whose families lived in the urban area of the city were examined (n = 5,914) and their mothers interviewed. These individuals have been prospectively followed at different ages. From June 2012 to February 2013, the cohort members were invited to attend the research clinic to be interviewed and examined (mean age: 30.2 years). Further details on the cohort methodology have been previously published (26, 27).

Victimization Due to Interpersonal Violence

Participants were asked about experiences of robbery ("assalto") any time in their lifetime, in the prior 10 years, and in the 12 months prior to interview at ages 23 and 30 years (**Table 1**). Four dichotomous variables were created about robbery up to age 30-years. Lifetime robbery up to age 30 years was coded positively if robbery was reported at either age 23 or 30. Robbery in the last 10 years up to age 30 was coded positively if that question was responded to positively at age 30, or if robbery in the previous 12 months was reported at age 23. Robbery in the last 12-months at age 30 years was less specific to the participant, and included two variables: first whether or not the participant or a family member had been "attacked or robbed" in the last 12 months (yes/no); second whether or not the household had been burgled in the past 12 months at age 30 years (yes/no).

Assessment of Mental Disorders

Major Depressive Disorder (MDD) and Generalized Anxiety Disorder (GAD) were assessed by trained psychologists (**Table 1**) using the Mini International Neuropsychiatric Interview (MINI), a short semi-structured diagnostic interview for the fourth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and the International Classification of Diseases, 10th revision (ICD-10). Both MDD and GAD symptoms were determined by preestablished algorithms in MINI (28). The occurrence of MDD and GAD comorbidity was also considered in the analyses.

Confounder Variables

The following variables were considered as possible confounders: sex (female; male); family income at birth (income tertiles); maternal age at birth (<20 years; 20–29 years; 30 years and over). Family income at birth, according to the minimum wage at the time, was originally collected in five categories in the perinatal study, and then transformed into a continuous

TABLE 1 | Description of the specific assessments covered by this study, according age, 1,982 Pelotas birth cohort, Brazil.

Exposure	Assessment age
Community familial victimization (over the last 12 months)	30 years
Burglary at home (over the last 12 months)	30 years
Robbery[a] (over the past 10 years)	23 and 30 years
Robbery[a] (lifetime)	23 and 30 years
Outcome	
Mental disorders	30 years

[a] *See more details on Methods Section.*

TABLE 2 | Sociodemographic, perinatal, lifestyle, robbery victimization and mental disorders characteristics, 1,982 Pelotas birth cohort, Brazil.

	n	%
Sociodemographic and perinatal characteristics		
Sex		
Female	1,886	51.7
Male	1,763	48.3
Familial income at birth (tertiles)		
Poorest	1,144	31.3
2nd	1,298	35.6
Wealthier	1,207	33.1
Maternal age at birth (years)		
<20	547	15.0
20–29	2,094	57.4
≥30	1,007	27.6
Race/skin color of the cohort member		
White	2,506	75.0
Black	534	16.0
Brown	187	5.6
Others	116	3.4
First time alcohol consumption at age 23 years (years)		
<13	921	28.0
13–22 or never	2,366	72.0
Years of schooling at age 23 years		
0–8	1,155	15.6
9–11	1,668	49.9
≥12	520	15.6
Familial income of minimum wage at age 30 years (tertiles)		
Poorest	1,157	33.2
2nd	1,149	33.0
Wealthier	1,175	33.8
Marital status at age 30 years		
Single	1,090	29.9
Married/common-law marriage	2,410	66.1
Separated/widowed	147	4.0
Household density at age 30 years (number of persons)		
One	270	7.7
Two	939	25.8
Three	1,174	32.2
Four	721	19.8
Five or more	540	14.8
Robbery victimization		
Robbery (lifetime)	1,528	41.9
Robbery (in the last 10 years)	1,017	27.9
Community familial victimization (in the last 12 months)	279	7.6
Burglary at home (in the last 12 months)	169	4.6
Mental disorders		
Major Depressive Disorder (MDD)	314	8.6
Generalized Anxiety Disorder (GAD)	362	9.9
MDD and GAD comorbidity	144	3.9

variable through principal component analysis (PCA) using four variables (affiliation to the public health care insurance system at birth, maternal schooling, height and skin color) and finally the same continuous variable was converted in income tertiles (29). At 23 years, age at first alcohol use (<13 years; 13–22 years or never), race/skin color (self-reported) using the official Brazilian classification of ethnicity, and complete years of schooling (0–8; 9–11; ≥12) were evaluated. At 30 years, household density (one; two; three; four; five and more people), familial income in tertiles (Poorest; 2nd; Wealthier), and marital status (single; married/common-law marriage; separated/widowed) were evaluated. The familial income in tertiles at 30 years was exclusively used as possible confounder for association between victimization in the 12 months prior to interview and mental disorders just because this covariate could be temporally associated with victimization exposure at 30 years and not in the prior 10 years or lifetime.

Statistical Analysis

Pearson's chi-square test was used to compare proportions. To estimate the prevalence ratio (PR) of mental disorders, Poisson regression, with a consistent covariance matrix estimator of the HC2 type was used (30). The final adjusted model considered as significant the association between exposure and outcome with significance set at 5%. Statistical analyses were performed in R program, version 3.3.2 (http://www.r-project.org).

RESULTS

In the 2012–13 visit, 3,701 individuals were interviewed at age 30 years. Considering also those who were identified as deceased, this represents a follow-up rate of 68.1%. Of those interviewed, 41.9% (1,528) reported at least one episode of robbery victimization in their lifetime, and 27.9% (1, 17) over the past 10 years. Regarding victimization in the last 12 months, 7.6% reported community victimization (of a family member) and 4.6% burglary at home. With regard to mental disorders at 30 years, 8.6% presented MDD, 9.9% GAD and 3.9% the MDD and GAD comorbidity (**Table 2**).

Table 3 shows the relationships of indicators of victimization with sociodemographic, perinatal, lifestyle and mental disorders variables. In the bivariate analysis, the prevalence of lifetime robbery was higher among females, those in the highest tertile of family income at birth, with maternal age at birth between 20 and 29 years, which have reported white skin color, first time alcohol consumption before 13 years and schooling >11 years at age 23 years, as well as among single individuals, and in the highest tertile of family income at age 30 years (p-value < 0.05). The prevalence of robbery over the last 10 years was higher among female, those in the highest tertile of family income at birth, with schooling >11 years at age 23 years, as well as among singles individuals and lower household density at age 30 years (p-value < 0.05). MDD, GAD and the MDD and GAD comorbidity were not associated with lifetime robbery or over the past 10 years. However, the prevalence of MDD was higher among those who reported community family victimization over the past 12 months (p-value < 0.05) and burglary at home in the same period (p-value < 0.05), both for GAD and for MDD and GAD comorbidity the pattern of association was similar (**Table 3**).

TABLE 3 | Frequency of robbery victimization, according to sociodemographic, perinatal, lifestyle and mental disorders at age 30 years, 1,982 Pelotas birth cohort, Brazil.

Variables	Robbery (lifetime)	Robbery (over the past 10 years)	Burglary at home (over the last 12 months)	Community familial victimization (over the last 12 months)
	n (%)	*n* (%)	*n* (%)	*n* (%)
Sex	$P = 0.001$	$P = 0.001$	$p = 0.074$	$p = 0.273$
Female	898 (50.9%)	544 (30.9%)	93 (5.3%)	126 (7.1%)
Male	630 (33.4%)	473 (25.1%)	76 (4.0%)	153 (8.1%)
Familial income at birth	$p = 0.001$	$p = 0.024$	$p = 0.592$	$p = 0.446$
Poorest	409 (35.8%)	299 (26.1%)	55 (4.8%)	96 (8.4%)
2nd	525 (40.4%)	347 (26.7%)	54 (4.2%)	91 (7.0%)
Wealthier	594 (49.2%)	371 (30.7%)	60 (5.0%)	92 (7.6%)
Maternal age at birth (years)	$p = 0.036$	$p = 0.857$	$p = 0.243$	$p = 0.089$
<20	217 (39.7%)	154 (28.2%)	32 (5.9%)	54 (9.9%)
20–29	915 (43.7%)	589 (28.1%)	97 (4.6%)	148 (7.1%)
≥30	396 (39.3%)	274 (27.2%)	40 (4.0%)	76 (7.5%)
Race/skin color of the cohort member	$p = 0.001$	$p = 0.134$	$p = 0.913$	$p = 0.944$
White	1,152 (46.0%)	724 (28.9%)	118 (4.7%)	190 (7.6%)
Black	190 (35.6%)	150 (28.1%)	25 (4.7%)	41 (7.7%)
Brown	61 (32.6%)	39 (20.9%)	8 (4.3%)	16 (8.6%)
Others	53 (45.7%)	32 (27.6%)	7 (6.0%)	10 (8.6%)
First time alcohol consumption at age 23 years (years)	$p = 0.001$	$p = 0.050$	$p = 0.053$	$p = 0.871$
<13	469 (50.9%)	285 (30.9%)	54 (5.9%)	72 (7.8%)
13–22 or never	973 (41.1%)	651 (27.5%)	101 (4.3%)	181 (7.7%)
Years of schooling at age 23 years	$p = 0.001$	$p = 0.047$	$p = 0.704$	$p = 0.377$
0–8	423 (36.6%)	296 (25.6%)	59 (5.1%)	96 (8.3%)
9–11	765 (45.9%)	497 (29.8%)	77 (4.6%)	128 (7.7%)
≥12	268 (51.5%)	152 (29.2%)	22 (4.2%)	33 (6.3%)
Familial income of minimum wage at age 30 years (tertiles)	$p = 0.001$	$p = 0.259$	$p = 0.469$	$p = 0.546$
Poorest	417 (36.0%)	304 (26.3%)	62 (5.4%)	88 (7.6%)
2nd	488 (42.5%)	325 (28.3%)	49 (4.3%)	96 (8.4%)
Wealthier	558 (47.5%)	344 (29.3%)	56 (4.8%)	84 (7.1%)
Marital status at age 30 years	$p = 0.001$	$p = 0.001$	$p = 0.966$	$p = 0.778$
Single	511 (46.9%)	378 (34.7%)	49 (4.5%)	79 (7.4%)
Married/common-law marriage	963 (40.0%)	605 (25.1%)	113 (4.7%)	189 (7.2%)
Separated/widowed	52 (35.4%)	33 (22.4%)	7 (4.8%)	10 (6.8%)
Household density at age 30 years (number of persons)	$p = 0.001$	$p = 0.001$	$p = 0.849$	$p = 0.447$
One	136 (50.4%)	100 (37.0%)	14 (5.2%)	18 (6.7%)
Two	441 (47.0%)	289 (30.8%)	42 (4.5%)	69 (7.3%)
Three	491 (41.8%)	330 (28.1%)	49 (4.2%)	81 (6.9%)
Four	269 (37.3%)	175 (24.3%)	37 (5.1%)	59 (8.2%)
Five or more	187 (12.3%)	121 (22.4%)	27 (5.0%)	50 (9.3%)
Major Depressive Disorder (MDD)	$p = 0.512$	$p = 0.556$	$p = 0.007$	$p = 0.008$
No	188 (8.9)	222 (8.4)	290 (8.3)	278 (8.2)
Yes	126 (8.2)	92 (9.3)	24 (14.2)	36 (12.9)
Generalized Anxiety Disorder (GAD)	$p = 0.859$	$p = 0.261$	$p = 0.057$	$p = 0.001$
No	212 (10.0)	252 (9.6)	338 (9.7)	319 (9.5)
Yes	150 (9.8)	110 (10.8)	24 (14.2)	43 (15.4)
MDD and GAD	$p = 0.972$	$p = 0.523$	$p = 0.006$	$p = 0.007$
No	83 (3.9)	100 (3.8)	130 (3.7)	124 (3.7)
Yes	61 (4.0)	44 (4.3)	14 (8.3)	20 (7.2)

p-value to the chi-squared test.

TABLE 4 | Relationship between robbery with Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD) and MDD and GAD comorbidity, 1,982 Pelotas birth cohort, Brazil.

Characteristics	MDD		GAD		MDD and GAD	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
	PR[a] (95% CI[b])	PR[a] (95% CI[b])	PR[a] (95% CI[b])	PR[a] (95% CI[b])	PR (95% CI[b])	PR[a] (95% CI[b])
Robbery (lifetime)						
No	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]
Yes	0.93 (0.75–1.15)	1.36 (1.08–1.70)[d]	0.98 (0.81–1.20)	1.36 (1.10–1.67)[d]	1.02 (0.74–1.41)	1.57 (1.11–2.22)[d]
Robbery (over the past 10 years)						
No	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]
Yes	1.07 (0.85–1.35)	1.32 (1.04–1.68)[d]	1.13 (0.91–1.40)	1.39 (1.11–1.73)[d]	1.14 (0.80–1.61)	1.45 (1.01–2.10)[d]
Burglary at home (over the last 12 months)						
No	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]
Yes	1.70 (1.16–2.51)	1.88 (1.29–2.73)[e]	1.46 (0.99–2.15)	1.47 (1.01–2.15)[e]	2.22 (1.30–3.77)	2.53 (1.52–4.22)[e]
Community familial victimization (over the last 12 months)						
No	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]	Ref[c]
Yes	1.56 (1.13–2.17)	1.60 (1.15–2.21)[e]	1.63 (1.21–2.19)	1.66 (1.24–2.21)[e]	1.95 (1.23–3.08)	2.10 (1.34–3.27)[e]

[a]Prevalence ratio; [b]Confidence interval; [c]Reference group; [d]Adjusted for sex, family income, Race/skin color of the cohort member, maternal age at birth, alcohol intake before 13 years old, years of schooling at age 23 years, marital status and household density at age 30 years; [e]Adjusted for sex, family income, Race/skin color of the cohort member, maternal age at birth, alcohol intake before 13 years old, years of schooling at age 23 years, marital status, family income in tertiles and household density at age 30 years.

After controlling for confounders, all types of victimization experiences (lifetime, past 10 years, past 12 months, in the community and at home) were associated with MDD, GAD and their comorbidity (**Table 4**). The occurrence of MDD was 36% [adjusted PR (aPR); 95% CI 1.08–1.70] and 32% (aPR; 95% CI 1.04–1.68) higher among those who were robbery victims, ever or in the last 10 years, respectively. For victimization over the past 12 months, both for burglary at home or community family victimization, the occurrence of MDD was 88% (aPR; 95% CI 1.29–2.73) and 60% (aPR; 95% CI 1.15–2.21) higher, respectively (**Table 4**). The occurrence of GAD was 36% (aPR; 95% CI 1.10–1.67) and 39% (aPR; 95% CI 1.11–1.73) higher among those who were victims of lifetime robbery and robbery in the past 10 years, respectively. With respect to victimization over the past 12 months, both for burglary at home or community family victimization, the occurrence of GAD was 47% (aPR; 95% CI 1.01–2.15) and 66% (aPR; 95% CI 1.24–2.21) higher, respectively (**Table 4**). Finally, the occurrence of comorbidity of MDD and GAD was 57% (aPR; 95% CI 1.11–2.22) and 45% (aPR; 95% CI 1.01–2.10) higher among those with lifetime and over the past 10 years robbery victimization, respectively. For victimization over the past 12 months, both for burglary at home or community family victimization, the occurrence of MDD and GAD was 2.53 (aPR; 95% CI 1.52–4.22) and 2.10 (aPR; 95% CI 1.34–3.27) higher, respectively (**Table 4**).

DISCUSSION

To our knowledge, this is one of the few population-based studies to evaluate the association of robbery victimization with depression, anxiety and their comorbidity. And, 42% of the study participants had experienced robbery by age 30 years, and about two thirds of these individuals reported that robbery victimization had occurred between 20 and 30 years. Lifetime robbery victimization and over past 10 years, as well as community family victimization and burglary at home over the past 12 months was associated with increased occurrence of Major Depressive Disorder, Generalized Anxiety Disorder and their comorbidity.

The high prevalence of robbery victimization between 20 and 30 years may be related to exposure in environments that are favorable to robbery in young adulthood, including commercial streets, public squares or collective transport (31), and the rise of urban violence in Pelotas in recent years. But many age groups are exposed to robbery in the city. In the Pelotas 1993 Birth Cohort Study, it was found that robbery was one of the most highly registered violent crimes up to age 18 years (20), based on official records. Robbery is also one of the three most common crimes that result in imprisonment in Rio Grande do Sul, the province to which Pelotas city belongs (32). The prevalence of community family victimization and burglary at home over the past 12 months were also high in the current study, a relatively common pattern in low and middle-income countries (33–37).

It is noteworthy, that in 2030 nearly 60% of the world's population will be living in urban areas, responsible for more than 75% of the world's Gross Domestic Product (38, 39). Therefore, beyond its psychosocial impacts and the reduction in life expectancy associated with violence (1, 40–42), it seems equally important to consider its economic burden (43), especially in low and middle-income countries, where rates of violence are so high.

Crude (unadjusted) analyses did not reveal associations between mental disorders and robbery occurring over the past 10 years. However, after adjusting for confounders, significant associations were observed, consistent with the results of Murray et al. for 18 years old (19). The association with robbery

victimization was higher for comorbidity of MDD and GAD, than that for MDD or GAD alone. For decades, research has identified the effects of violence in the home on mental disorders (13, 44), but less attention has been given to the specific effects of events such as robbery in the community (19). This is an important issue, especially in contexts where community violence is common.

The prevalence of MDD, GAD, as well as MDD and GAD comorbidity was higher among those who reported at least one episode of community family violence in the last 12 months, as well as among the victims of burglary at home. This is consistent with other Brazilian studies. A cohort study with workers from a Brazilian university showed a higher occurrence of common mental disorder among those who reported having been victims of robbery (aOR = 1.5; 95% CI 1.2–1.8) (45) and higher psychological stress for those who reported direct violence victimization in the last 12 months (aOR 1.6; 95% CI 1.0–2.4) (40). A study with individuals aged 15–24 years in São Paulo city observed an association of violent victimization in the last 12 months with anxiety symptoms (aOR 1.68; 95% CI 1.01–2.78) and MDD (aOR 2.27; 95% CI 1.09–4.74) (36). Similarly, a study carried out in 2007–2008 in Rio de Janeiro and São Paulo cities (15), observed an association of exposure to traumatic events over the past 12 months with MDD (aOR 1.20; 95% CI 1.15–1.24), GAD (aOR 1.19; 95% CI 1.12–1.26) and post-traumatic stress disorder (TSPT) (aOR 1.30; 95% CI 1.24–1.36).

Our results are also consistent with studies in other locations. A study carried out with adults in United States (21) reported an association of lifetime robbery with anxiety (aOR 1.38; 95% CI 1.04–1.76) and mood disorders (aOR 1.31; 95% CI 1.07–1.59). In addition, a study carried out in London (22) showed that adults exposed to lifetime violent victimization (attacks, burglary, robbery, physical aggression and sexual violence) had greater odds of common mental disorder (aOR 2.86; 95% CI 1.82–4.49) and post-traumatic stress disorder (aOR 13.38; 95% CI 5.13–34.90), reinforcing that community violence may be related to mental disorders.

Victims report that robbery is a very frightening experience, contributing to fear of future community violence (23), and robbery victimization is usually related to intensification of anguish feelings, worry and fear (23). Our results indicate that the magnitude of association with robbery was slightly greater for GAD, in comparison to MDD, regardless of the time period evaluated. As fear and excessive worry are symptoms frequently associated with anxiety (24), the stronger association observed for robbery and GAD could be partially explained by feelings of fear and related concerns of further robbery victimization (25).

Several mechanisms have been proposed to explain the relationship between community violence and mental disorders throughout the lifecourse (46, 47). The short and long-term effects of robbery on mental disorders have been mostly discussed based on different pathophysiological responses focused on trauma (19) or stressful events with the potential to modify the functioning of the sympathetic nervous system and the axis hypothalamic-pituitary-adrenal (HPA) (24, 48), inflammatory mechanisms in the brain and peripherally (49) or even with epigenetic mechanisms (50). Regarding depression and anxiety disorders, HPA axis hyperactivity has been the main pathophysiological mechanism associated with stressful events resulting from interpersonal violence, at different stages in the lifecourse (51–53). In addition, there are also the approach to psychological mechanisms, where its impairment functioning due to early trauma would leading to limited response capacity in the face up to stress experiences lifelong (7, 47, 54).

Lifetime robbery and over the past 10 years was more common among females, as well as in white, single individuals, living in households with lower household density and among individuals whose family income at birth was in the highest income tertile. These results are in line with other literature on non-lethal community violence victimization (19, 21, 55, 56). Unlike the characteristics associated with non-lethal community violence victimization, homicide is more frequent among poor males and those of black race/skin color (57–60). This opposite pattern observed for robbery victims is, in some sense, expected because is presumed that the offender overall seeks to select apparently richest people, either on his physical appearance, clothing items, type of goods or places frequented.

This study has some limitations, the term "assalto" is commonly used in Brazil and it can be translated as "robbery." But it does not necessarily correspond to an episode of robbery, as it is also associated with theft, a type of crime in which there is no threatening contact between the victim and the aggressor. Therefore, theft victimization might have underestimated the magnitude of the observed associations, its potential for psychological trauma is lower than robbery, because the victim is prone not only to threat or intimidation, but also to serious physical aggression, for example. Because we did not collect data on the use of weapon during the victimization, nor on the context or number of episodes of robbery victimization, we were not able to evaluate the impact of exposure severity. Therefore, even though we have evaluated the exposures at different times (lifetime, in the last 10 years, and the last 12 months) and its association with mental disorders at 30 years of age, probably softening the temporality problem, we have no way of knowing whether the investigated mental disorders outcomes were already present at the time of exposure. Finally, although we have handled data the Pelotas 1982 birth cohort study, our analysis was focused in data at birth, 23 and 30 years old, because on previous follow-up visits, such as those which have been performed between 6 and 19 years old, has not been possible gathering more detailed information about early life stress events (e.g., childhood and adolescence) to the whole sample in any of these follow-up visits. Therefore, it is possible that the lack of on the domestic environment during childhood and adolescence, especially child maltreatment, as sexual, physical or emotional abuse, or other types of early life stress events as death of a family member, which are potential confounders, may have overestimated the magnitude of the associations. Strengths of this study include the high follow-up rate at age 30 years (68.1%), the large sample size, the assessment of mental disorders using diagnostic instruments, reducing the likelihood of classification error.

The results of this study reinforce prior findings on the influence of recent episodes of community violence on

the occurrence of mental disorders, but also points to a possible influence of long-term effects on depression and anxiety in young adults. Given the importance of community violence for mental disorders in increasingly urbanized cities, it is desirable that stakeholders also increase its efforts to preventing, reducing or mitigating the consequences of exposure to community violence, offering support services for victims, mainly in low and middle-income countries where socioeconomic and access to health services determinants play an important role.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Research Ethics Committee of the School of Medicine, Federal University of Pelotas. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

JO, JM, and BH contributed to conceptualization, analysis, and organized the findings and subsequently put the information in a manuscript format. NL organized the database and was involved in the data analysis, figure tables, and the writing of the manuscript. RP contributed to organization, data analysis, and the writing of the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

The research project was partially financed by Wellcome, Award Number 086974/Z/08/Z and the Joe's current Wellcome Investigator Award Number is 210735/Z/18/Z. This research was funded in part, by the Graduate Studies Coordinating Board (Capes), funding code 001, and is currently financed by the Science of Technology Department, Brazilian Ministry of Health.

REFERENCES

1. Vos T, Lim SS, Abbafati C, Abbas KM, Abbasi M, Abbasifard M, et al. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the global burden of disease study 2019. *Lancet.* (2020) 396:1204–22. doi: 10.1016/S0140-6736(20)30925-9
2. Kohn R, Levav I, Almeida JMC de, Vicente B, Andrade L, Caraveo-Anduaga JJ, et al. Los trastornos mentales en América Latina y el Caribe: asunto prioritario para la salud pública. *Rev Panam Salud Pública.* (2005) 18:229–40. doi: 10.1590/S1020-49892005000900002
3. Orellana JDY, Ribeiro MRC, Barbieri MA, Saraiva M da C, Cardoso VC, Bettiol H, et al. Mental disorders in adolescents, youth, and adults in the RPS birth cohort Consortium (Ribeirão Preto, Pelotas and São Luís), Brazil. *Cadernos Saúde Pública.* (2020) 36:e00154319. doi: 10.1590/0102-311x00154319
4. Arseneault L. The long-term impact of bullying victimization on mental health. *World Psychiatry.* (2017) 16:27–28. doi: 10.1002/wps.20399
5. Lund C, Brooke-Sumner C, Baingana F, Baron EC, Breuer E, Chandra P, et al. Social determinants of mental disorders and the sustainable development goals: a systematic review of reviews. *Lancet Psychiatry.* (2018) 5:357–69. doi: 10.1016/S2215-0366(18)30060-9
6. Chandan JS, Thomas T, Gokhale KM, Bandyopadhyay S, Taylor J, Nirantharakumar K. The burden of mental ill health associated with childhood maltreatment in the UK, using the health improvement network database: a population-based retrospective cohort study. *Lancet Psychiatry.* (2019) 6:926–34. doi: 10.1016/S2215-0366(19)30369-4
7. LeMoult J, Humphreys KL, Tracy A, Hoffmeister JA, Ip E, Gotlib IH. Meta-analysis: exposure to early life stress and risk for depression in childhood and adolescence. *J Am Acad Child Adol Psychiatry.* (2020) 59:842–55. doi: 10.1016/j.jaac.2019.10.011
8. Cuartas J, Leventhal T. Exposure to community violence and children's mental health: a quasi-experimental examination. *Soc Sci Med.* (2020) 246:112740. doi: 10.1016/j.socscimed.2019.112740
9. Benjet C, Axinn WG, Hermosilla S, Schulz P, Cole F, Sampson L, et al. Exposure to armed conflict in childhood vs older ages and subsequent onset of major depressive disorder. *JAMA Network Open.* (2020) 3:e2019848. doi: 10.1001/jamanetworkopen.2020.19848
10. Belleville G, Marchand A, St-Hilaire MH, Martin M, Silva C. PTSD and depression following armed robbery: patterns of appearance and impact on absenteeism and use of health care services: PTSD and MDD after armed robbery. *J Traumatic Stress.* (2012) 25:465–8. doi: 10.1002/jts.21726
11. Fichera GP, Fattori A, Neri L, Musti M, Coggiola M, Costa G. Post-traumatic stress disorder among bank employee victims of robbery. *Occup Med.* (2015) 65:283–9. doi: 10.1093/occmed/kqu180
12. Setti I, van der Velden PG, Sommovigo V, Ferretti MS, Giorgi G, O'Shea D, et al. Well-being and functioning at work following thefts and robberies: a comparative study. *Front Psychol.* (2018) 9:168. doi: 10.3389/fpsyg.2018.00168
13. Cole AR, Jaccard J, Munson MR. Young adult trauma symptoms in the context of community violence exposure. *J Commun Psychol.* (2020) 48:2517–31. doi: 10.1002/jcop.22437
14. Ribeiro WS, Andreoli SB, Ferri CP, Prince M, Mari JJ. Exposure to violence and mental health problems in low and middle-income countries: a literature review. *Revista Brasileira de Psiquiatria.* (2009) 31(Suppl. 2):S49–57. doi: 10.1590/S1516-44462009000600003
15. Ribeiro WS, Mari J de J, Quintana MI, Dewey ME, Evans-Lacko S, Vilete LMP, et al. The impact of epidemic violence on the prevalence of psychiatric disorders in são paulo and rio de janeiro, Brazil. *PLoS ONE.* (2013) 8:e63545. doi: 10.1371/journal.pone.0063545
16. Peltzer K. Risk for traumatization among violent crime victims in an urban community sample in South Africa. *Curationis.* (2000) 23:22–27. doi: 10.4102/curationis.v23i4.734
17. Scarpa A. Community violence exposure in young adults. *Trauma Viol Abuse.* (2003) 4:210–27. doi: 10.1177/1524838003004003002
18. Shaw M, Van Dijk J, Rhomberg W. Determining trends in global crime and justice: An overview of results from the United Nations surveys of crime trends and operations of criminal justice systems. *Forum Crime Soc.* (2003) 3:35–63.
19. Murray J, Lima NP, Ruivo ACO, Ramírez Varela A, Bortolotto CC, Magalhães EI da S, et al. Lifelong robbery victimisation and mental disorders at age 18 years: Brazilian population-based study. *Soc Psychiatry Psychiatric Epidemiol.* (2018) 53:487–96. doi: 10.1007/s00127-018-1488-z
20. Gallo EAG, Menezes AMB, Murray J, Silva LAD da, Wehrmeister FC, Gonçalves H, et al. Criminal victimization in childhood and adolescence

according to official records: the Pelotas (Brazil) birth cohort study. *Cadernos Saúde Pública*. (2016) 32:1–13. doi: 10.1590/0102-311X00072915
21. Iverson KM, Dick A, McLaughlin KA, Smith BN, Bell ME, Gerber MR, et al. Exposure to interpersonal violence and its associations with psychiatric morbidity in a U.S. national sample: A gender comparison. *Psychol Viol.* (2013) 3:273–87. doi: 10.1037/a0030956
22. Kadra G, Dean K, Hotopf M, Hatch SL. Investigating exposure to violence and mental health in a diverse urban community sample: data from the south east London community health (SELCoH) survey. *PLoS ONE.* (2014) 9:e93660. doi: 10.1371/journal.pone.0093660
23. Gale JA, Coupe T. The behavioural, emotional and psychological effects of street robbery on victims. *Int Rev Victimol.* (2005) 12:1–22. doi: 10.1177/026975800501200101
24. Indovina I, Robbins TW, Núñez-Elizalde AO, Dunn BD, Bishop SJ. Fear-conditioning mechanisms associated with trait vulnerability to anxiety in humans. *Neuron.* (2011) 69:563–71. doi: 10.1016/j.neuron.2010.12.034
25. Alves CR da S, Paula PP de. Violence i1n the work: the possible relationships between assaults and PTSD in drivers and conductors from a public transport company. *Cadernos Psicol Soc Trabalho*. (2009) 12:35. doi: 10.11606/issn.1981-0490.v12i1p35-46
26. Barros FC, Victora CG, Horta BL, Gigante DP. Methodology of the pelotas birth cohort study from 1982 to 2004-5, Southern Brazil. *Rev Saude Publica.* (2008) 42:7–15. doi: 10.1590/S0034-89102008000900003
27. Horta BL, Gigante DP, Goncalves H, dos Santos Motta J, Loret de Mola C, Oliveira IO, et al. Cohort profile update: the 1982 pelotas (Brazil) birth cohort study. *Int J Epidemiol.* (2015) 44:441–441e. doi: 10.1093/ije/dyv017
28. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The mini-international neuropsychiatric interview (MINI): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry.* (1998) 59:22–33. doi: 10.1037/t18597-000
29. Barros A, Victora C, Horta B, Gonçalves H, Lima R, Lynch J. Effects of socioeconomic change from birth to early adulthood on height and overweight. *Int J Epidemiol.* (2006) 35:1233–8. doi: 10.1093/ije/dyl160
30. Cribari-Neto F. Improved heteroscedasticity-consistent covariance matrix estimators. *Biometrika.* (2000) 87:907–18. doi: 10.1093/biomet/87.4.907
31. Ministério da Justiça SN de SP. *Estudos Sobre Vitimização*. Brasília: Ministério da Justiça (2017).
32. Costa CR, Sassi RAM, Tímbola VDS, Lazzari TR, Reis AJ, Gonçalves CV. Prevalence and associated factors with depression and anxiety in prisoners in South of Brazil. *Arch Clin Psychiatry.* (2020) 47:89–94. doi: 10.1590/0101-60830000000239
33. Cruz SH da, Azevedo MR, Gonçalves H. Vitimização por violência urbana em uma cidade de médio porte do sul do Brasil. *Rev Brasil Epidemiol.* (2011) 14:15–26. doi: 10.1590/S1415-790X2011000100002
34. Duque LF, Montoya NE, Restrepo MV. Magnitud y distribución de diferentes formas de violencia en Medellín, 2003-2004. *Rev Facult Nac Salud Pública.* (2006) 24:61–72.
35. Pinto-Cortez C, Guerra Vio C, Barocas B, Pereda N. Victimization and poly-victimization in a national representative sample of children and youth: the case of chile. *J Aggress Maltreat Trauma.* (2020) 29:1–19. doi: 10.1080/10926771.2020.1796873
36. Jaen-Varas D, Mari J de J, Coutinho E da S, Andreoli SB, Quintana MI, de Mello MF, et al. A cross-sectional study to compare levels of psychiatric morbidity between young people and adults exposed to violence in a large urban center. *BMC Psychiatry.* (2016) 16:134. doi: 10.1186/s12888-016-0847-0
37. Weigend Vargas E, Villarreal González S. Firearms and injuries during home robberies in Mexico, 2010–2017. *Trends Organized Crime*. (2020) 25:84–107. doi: 10.1007/s12117-020-09383-x
38. United Nations D of E and SA Population Division. Revision of world urbanization prospects. *World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420)* (2019). Available online at: https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf (accessed May 23, 2022).
39. Acuto M, Parnell S, Seto KC. Building a global urban science. *Nat Sustainability*. (2018) 1:2–4. doi: 10.1038/s41893-017-0013-9
40. Murray J, Cerqueira DR de C, Kahn T. Crime and violence in Brazil: systematic review of time trends, prevalence rates and risk factors. *Aggress Viol Behav.* (2013) 18:471–83. doi: 10.1016/j.avb.2013.07.003
41. Canudas-Romo V, Aburto JM. Youth lost to homicides: disparities in survival in Latin America and the Caribbean. *BMJ Global Health.* (2019) 4:e001275. doi: 10.1136/bmjgh-2018-001275
42. Vilalta C. Violence in Latin America: an overview of research and issues. *Ann Rev Soc.* (2020) 46:693–706. doi: 10.1146/annurev-soc-073018-022657
43. Velásquez A. The economic burden of crime: evidence from Mexico. *Economist*. (2010) 55:1287–318. doi: 10.3368/jhr.55.4.0716-8072R2
44. Fowler PJ, Tompsett CJ, Braciszewski JM, Jacques-Tiura AJ, Baltes BB. Community violence: a meta-analysis on the effect of exposure and mental health outcomes of children and adolescents. *Dev Psychopathol.* (2009) 21:227–59. doi: 10.1017/S0954579409000145
45. Lopes CS, Faerstein E, Chor D. Eventos de vida produtores de estresse e transtornos mentais comuns: resultados do Estudo Pró-Saúde. *Cadernos Saúde Pública.* (2003) 19:1713–20. doi: 10.1590/S0102-311X2003000600015
46. Loeber R, Hay D. Key issues in the development of aggression and violence from childhood to early adulthood. *Ann Rev Psychol.* (1997) 48:371–410. doi: 10.1146/annurev.psych.48.1.371
47. Tolan PH. Community violence exposure and developmental psychopathology. In: Cicchetti D, editor. *Developmental Psychopathology*. Hoboken, NJ: John Wiley & Sons, Inc (2016) p1–43.
48. Lucassen PJ, Pruessner J, Sousa N, Almeida OFX, Van Dam AM, Rajkowska G, et al. Neuropathology of stress. *Acta Neuropathol.* (2014) 127:109–35. doi: 10.1007/s00401-013-1223-5
49. Liu YZ, Wang YX, Jiang CL. Inflammation: the common pathway of stress-related diseases. *Front Human Neurosci.* (2017) 11:316. doi: 10.3389/fnhum.2017.00316
50. Januar V, Saffery R, Ryan J. Epigenetics and depressive disorders: a review of current progress and future directions. *Int J Epidemiol.* (2015) 44:1364–87. doi: 10.1093/ije/dyu273
51. Heim C, Newport DJ, Mletzko T, Miller AH, Nemeroff CB. The link between childhood trauma and depression: insights from HPA axis studies in humans. *Psychoneuroendocrinology.* (2008) 33:693–710. doi: 10.1016/j.psyneuen.2008.03.008
52. Russell G, Lightman S. The human stress response. *Nat Rev Endocrinol.* (2019) 15:525–34. doi: 10.1038/s41574-019-0228-0
53. Alhalal E, Falatah R. Intimate partner violence and hair cortisol concentration: a biomarker for HPA axis function. *Psychoneuroendocrinology.* (2020) 122:104897. doi: 10.1016/j.psyneuen.2020.104897
54. Kuzminskaite E, Penninx BWJH, van Harmelen AL, Elzinga BM, Hovens JGFM, Vinkers CH. Childhood trauma in adult depressive and anxiety disorders: an integrated review on psychological and biological mechanisms in the NESDA cohort. *J Affect Disord.* (2021) 283:179–91. doi: 10.1016/j.jad.2021.01.054
55. Ávila ME, Martínez-Ferrer B, Vera A, Bahena A, Musitu G. Victimization, perception of insecurity, and changes in daily routines in Mexico. *Rev Saúde Pública.* (2016) 50:1–9. doi: 10.1590/S1518-8787.2016050006098
56. Gaviria A, Pagés C. Patterns of crime victimization in Latin American cities. *J Dev Eco.* (2002) 67:181–203. doi: 10.1016/S0304-3878(01)00183-3
57. Horta BL, Gigante DP, Candiota JS, Barros FC, Victora CG. Monitoring mortality in pelotas birth cohort from 1982 to 2006, Southern Brazil. *Rev Saúde Pública.* (2008) 42(Suppl. 2):108–14. doi: 10.1590/S0034-89102008000900015
58. García HI, Giraldo CA, López MV, Pastor M del P, Cardona M, Tapias CE, et al. Treinta años de homicidios en medellín, Colombia, 1979-2008. *Cadernos Saúde Pública.* (2012) 28:1699–712. doi: 10.1590/S0102-311X2012000900009
59. Orellana JDY, Cunha GM da, Brito BC de S, Horta BL, Orellana JDY, Cunha GM da, et al. Factors associated with homicide in manaus, Amazonas, Brazil, 2014. *Epidemiol Serv Saúde.* (2017) 26:735–46. doi: 10.5123/S1679-49742017000400006
60. Lemos YV, Wainstein AJA, Savoi LM, Drummond-Lage AP. Epidemiological and toxicological profile of homicide victims in a legal medicine unit

in Brazil. *J Forensic Legal Med.* (2019) 65:55–60. doi: 10.1016/j.jflm.2019.05.008

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Advantages of publishing in Frontiers

OPEN ACCESS
Articles are free to read for greatest visibility and readership

FAST PUBLICATION
Around 90 days from submission to decision

HIGH QUALITY PEER-REVIEW
Rigorous, collaborative, and constructive peer-review

TRANSPARENT PEER-REVIEW
Editors and reviewers acknowledged by name on published articles

Frontiers
Avenue du Tribunal-Fédéral 34
1005 Lausanne | Switzerland

Visit us: www.frontiersin.org
Contact us: frontiersin.org/about/contact

REPRODUCIBILITY OF RESEARCH
Support open data and methods to enhance research reproducibility

DIGITAL PUBLISHING
Articles designed for optimal readership across devices

FOLLOW US
@frontiersin

IMPACT METRICS
Advanced article metrics track visibility across digital media

EXTENSIVE PROMOTION
Marketing and promotion of impactful research

LOOP RESEARCH NETWORK
Our network increases your article's readership