POST-TRAUMATIC STRESS DISORDER AND COMPLEX TRAUMATIC STRESS DISORDER IN CHILDREN AND ADOLESCENTS

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POST-TRAUMATIC STRESS DISORDER AND COMPLEX TRAUMATIC STRESS DISORDER IN CHILDREN AND ADOLESCENTS

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EDITORIAL
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Editorial: Post-traumatic Stress Disorder and Complex Traumatic Stress Disorder in Children and Adolescents

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Keywords: cross cultural approach, PTSD, CPTSD, collective trauma, trauma transmission

Editorial on the Research Topic

Post-traumatic Stress Disorder and Complex Traumatic Stress Disorder in Children and Adolescents

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Psychological trauma constitutes a determinant experience of adversity in the emotional development of children and adolescents. Unidentified and untreated traumatic experiences, sometimes cumulative, can interfere with the child's development and impair his or her psychological and somatic functioning, leading in some cases to the development of post-traumatic stress disorder (PTSD) or complex post-traumatic stress disorder (CPTSD).

Post-Traumatic Stress Disorder and Complex Traumatic Stress Disorder in Children and Adolescents explores the many facets of traumatic experiences encountered in childhood and adolescence. Authors from several professional and cultural backgrounds present clinical and original research work in varied settings. They are especially mindful of the cross-fertilization of evidence-based and culture-relevant therapeutic techniques. In these studies, the patients come from all over the world, from Asia, Africa, the Middle East, the Americas, and Europe. Some of the studies also deal with specific migrant populations who are susceptible to PTSD and CPTSD. Particular attention is also paid to transcultural factors and their impact on symptoms and treatment.

The authors, clinical practitioners and researchers, opted for an open definition of traumatic disorders, broader than the strict psychiatric definition of PTSD. Their clinical practice shows a vast array of traumatic symptoms triggered by external distressing events. They also sheds light on traumatic symptoms induced by internal conflicts related to the important changes in the body during puberty and adolescence. During infancy, deficiencies in early interactions between babies and their caretakers can obstruct the emotional regulation process.

Trauma is a psychophysical experience, and traumatized patients suffer from diverse somatic symptoms (1, 2). However, little is known about the relation between sleep disorders, depression, and PTSD in refugee children. Park et al. show that depression may mediate the links between PTSD and insomnia. Tarazi-Sahab et al. discuss the potentially traumatogenic role puberty can play in adolescence. Verelst et al. consider an *a priori* pathological behavior—avoidant/disengagement coping—as a protective factor against post-traumatic stress and anxiety.

The environments of children and adolescents play an important role in the evolution of their direct or indirect exposure to a highly distressing event into a stress-related disorder. The family, social, and cultural environments can either acknowledge the experience and support these youth, or they can deny it and thus exacerbate the problems. El-Khodary et al. and Brown et al. study these complex interrelationships in two quite different contexts: the first among Palestinian children living in the Gaza Strip, essentially a war zone, and the second among students after an ecological disaster (a wildfire).

Two studies by Grenon et al. and Gindt et al. look at collective violence, presenting study protocols on recent terrorist attacks in Europe. There is a serious lack of data about the direct and long-term consequences of exposure to terrorist attacks and mass murders in childhood and adolescence. Both studies provide valuable contributions to our understanding of the impact of collective traumatic events intentionally inflicted by other humans.

Qualitative approaches, including narrative, are valuable in increasing our understanding of the relations between traumatic event, child-parent interaction, and post-traumatic symptoms. Radjack et al. developed a research-action program aiming to transmit cultural know-how to social workers who provide care for migrant youths traveling without their parents. Based on a transcultural approach, the program aims to assist these migrant youths in developing, through narrative, their bicultural adolescences. Klein et al. tackle the complex issue of how to deal with underage children, born or taken by their parents to jihadist group operation areas, when they return to France. In both articles, the authors resort to structuring narratives in their approaches. Finally, Roques et al. present a protocol where interviews and quantitative data will be collected from psychological tests to explore the complex links between bullying and PTSD in adolescence.

For children, trauma may also be experienced indirectly through transgenerational transmission of trauma from parents (or other primary caregivers) to children (3). The mechanisms behind this transmission of parental trauma in complex settings such as war or migration nonetheless remain unclear. The study by Dozio et al. on this topic shows how the mother, in narrating her trauma, can disconnect from or detune her interaction with her infant and what repercussions it can have on the infant's behavior and interaction.

In some cases, unidentified and cryptic traumatic experiences may manifest through symptoms and relational dysfunctions in situations where a part of the child's history is unknown. Mansouri et al. mixed sociological, psychological, and transcultural approaches to broaden their perspective on the French "riots" of 2005. Their model includes the traumatic impact of past violence in France's colonial history. The authors argue that the collective silencing of the colonial past, by preventing the necessary discussion/narration of past traumatic experiences, contributes to the acting out of violence that lacks other means of expression.

Less is known about ascendant transmission of trauma. When babies and children are exposed to traumatic experiences, what impact does this exposure to trauma have on caregivers' representations and care abilities? Skandrani et al. explored this issue in adoption contexts. They highlighted the need for a support program for parents in their adoption procedure, to enable better parental preparation to welcome a child and help the child alleviate the trauma's impact on his or her emotional development. Nascimento et al. studied the representations that social caregivers working in childcare shelters have of the babies' lives before institutionalization. The psychological impact of these representations is frequently underestimated, and building narratives where children overcome the marks and frustrations caused by abandonment in early childhood and living in an institution appears an effective and potentially important way of preventing emotional distress.

Narrative approaches are preferred by many authors for therapy for PTSD and CPTSD. Narrative Exposure Therapy is a well-known method developed for adult PTSD (4), but few studies have examined its use with children, and even fewer for childhood CPTSD. Fazel et al. describe its adaptation for children and adolescents in different contexts, with promising results. In a different type of narrative strategy, El-Khodary et al. present a complete school-based narrative intervention with students to prevent the emergence of PTSD symptoms after exposure to war related trauma.

The original research articles and clinical cases in *Post-Traumatic Stress Disorder and Complex Traumatic Stress Disorder in Children and Adolescents* address the multiple configurations of events leading to the development of traumatic symptoms or PTSD: collective and individual traumatic experiences, event-related and internal conflict-related traumatic constellations. A qualitative approach to PTSD and CPTSD in children and adolescents opens the way to an in-depth discussion about adjusting therapeutic strategies to the particular traumatic experience and the available resources.

AUTHOR CONTRIBUTIONS

JL, ME, CR, and MM wrote the manuscript and gave final approval. All authors contributed to the article and approved the submitted version.

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ORIGINAL RESEARCH
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The Contribution of Posttraumatic Stress Disorder and Depression to Insomnia in North Korean Refugee Youth

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Refugees are exposed to multiple traumatic and stressful events and thereby are at higher risk for developing a variety of psychological sequelae including posttraumatic stress disorder (PTSD). However, the relation of PTSD to other mental health conditions has not been fully revealed in refugee populations. The present study investigated relationships among trauma exposure, PTSD, depression, and insomnia in North Korean refugee youth. Seventy-four refugee youth were assessed for exposure to traumatic events, PTSD, depression, and insomnia symptoms. The results showed high rates of multiple trauma exposures among the refugee youth and high incidences of co-occurring symptoms of PTSD and insomnia in those who have multiple trauma. Furthermore, the overall symptoms and four cluster symptoms of PTSD were strongly correlated with insomnia in addition to depression. In the path model to predict insomnia, PTSD affected insomnia only through depression, indicating that the greater the levels of PTSD suffered, the greater the likelihood for developing sleep problems *via* depression. The present study indicates how sleep problems relate to trauma-related symptoms, i.e., PTSD and depression in refugee populations, and highlights the need for further investigation of the specific relation between sleep problems and trauma-related symptoms for effective evaluation and intervention.

Keywords: multiple trauma, posttraumatic stress disorder, insomnia, depression, North Korean refugee youth

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INTRODUCTION

Refugees are frequently exposed to traumatic and stressful events of different types ranging in numbers between 2 and 17 (1–5). The greater the number of traumatic events experienced, the greater the likelihood for developing a variety of psychological sequelae such as posttraumatic stress disorder (PTSD) and depression (5–7) and the smaller the likelihood for remission without treatment (8). A systematic review of the literature on psychiatric prevalence in refugees shows that the heterogeneity of the samples and findings was considerable (9). Importantly, there is no meaningful general, standard prevalence rate for refugees due to the heterogeneity of factors associated with mental health, such as characteristics of trauma unreported on or samples that are difficult to access (10).

Hyperarousal is a defining feature of PTSD and usually includes the inability to obtain a normal sleep. Nightmares contribute to the disturbed sleep patterns. Consequently, the prevalence of insomnia has been found to be elevated in survivors of traumatic stressors. For instance, in a representative population-based sample study, adolescents with a history of childhood adversity were more likely to have insomnia later in life than those who did not report exposure to adversity (11). In addition, experiencing more adversities increased the risk of insomnia, which indicates a dose–response relationship (11). On the other hand, clients with longer pretreatment total sleep time and pretreatment Rapid Eye Movement (REM) sleep duration showed a better treatment outcome (12), whereby Narrative Exposure Therapy (NET) resulted in an increased reduction in sleep latency and a reduction in arousals over time.

Only few studies have examined sleep in refugee children. Hjern et al. (13) found a close link between sleep disturbance and experiences of persecution among Chilean refugee children. Montgomery and Foldspang (14) suggested that the presence of sleep disturbance was predicted by violent exposures and stressful family situations in the refugee children from the Middle East. One study concerning insomnia among adult refugee populations showed high rates of insomnia in North Korean refugees (aged 38 ± 12 years) when compared to the general population (38% vs. 9%) (15). The authors also compared trauma exposure and mental health problems reported by North Korean refugees with insomnia to those reported by North Korean refugees without insomnia and found that North Korean refugees with insomnia reported having experienced a larger number of traumatic events and higher levels of PTSD and depression symptoms. Although these findings suggest that it may be fruitful to investigate insomnia in refugee populations, research on insomnia among these populations is scarce.

PTSD commonly occurs with other mental health outcomes in refugees (16–18). Studies of trauma-affected populations have found the mediation effect of PTSD on mental health outcomes such as depression, substance abuse, physical health, and personality disorder (3, 19, 20). Although research evidence suggests that PTSD may provide a link between trauma exposure and the presence of comorbid mental health symptoms (3, 19, 20), the relationship between PTSD and other mental health conditions has not been fully revealed in refugee populations.

In North Korean refugee adolescents and youth, studies have found high rates of trauma exposure and high levels of consequent psychopathology including PTSD and depression (3, 21, 22–26). North Korean children and adolescents are exposed to multiple traumatic experiences not only in North Korea but also during defection and stay in the third-world country (3, 27). The most commonly reported trauma includes witnessing execution or torture, witnessing traumatic incidents involving family members (death, arrest, etc), experiencing or witnessing violence, chronic malnutrition, hunger-related illnesses, witnessing death from starvation, and incarceration (3, 22, 27). In particular, North Korean female adolescents are likely to face forced marriage, sexual assault, or prostitution by Chinese human traffickers or brokers (27). The association between the level of trauma exposure and the severity of mental health outcomes including PTSD has been found to be robust (3, 22, 24). Kim (3) investigated interrelationships among trauma exposure, PTSD, and comorbid mental health problems in North Korean refugee youth and found that PTSD mediated the relationships between interpersonal trauma and comorbid mental health problems. However, there is a lack of research on insomnia and its relation to trauma exposure and PTSD among North Korean refugee youth.

The aim of the present study was to examine relationships among trauma exposure, PTSD, depression, and insomnia in a sample of North Korean refugee youth. Our first hypothesis was that higher rates of co-occurring symptoms of PTSD and insomnia would be found in those who have experienced a greater number of traumatic events. The second hypothesis was that PTSD would be associated with insomnia as well as depression. Finally, in order to predict insomnia in a single model, we used path analysis to evaluate the third hypothesis that trauma exposure would affect insomnia through PTSD and depression. We assumed that in this sample, depression symptom severity mainly would arise as a consequence of PTSD symptom severity. The paths in the model were predetermined by theoretical assumptions, previous empirical research, and temporal precedence.

MATERIALS AND METHODS

Sample

The sample consisted of 74 refugees (47 females and 27 males) with a mean age of 18.7 years (SD = 2.5; range, 15–29). Of the overall sample, 35 participants (47%) were born in North Korea and 39 participants (53%) were born in China. The youth who were born in China were the children who were born from forced marriages between North Korean women and Chinese men. As these marriages are illegal under Chinese law, the youth were not given citizenship and escaped to South Korea with their mother. Thus, we defined North Korean refugee youth as the youth who were born in North Korea or in China in the present study. The two groups differed with respect to age (t = 3.5, p = .001) and gender ratio (χ^2 = 10.7, df = 1, p = .002). There was no significant difference in the number of trauma types between groups (t = 1.4, p = .174). With regard to content of the trauma types, we found only one difference between groups. More than half of North Korean youth who were born in North Korea reported having an experience of seeing someone being beaten, shot at, or killed (68.2%), whereas 31.8% of North Korean youth who were born in China had experienced this type of trauma, χ^2 = 5.908, df = 1, p = .021.

Procedure

Participants were recruited from a specialized school for North Korean refugee youth, which offers middle and high school education in South Korea. Anyone who is a North Korean refugee youth can apply to this school and will be assigned to this school selectively according to the decision of the school board. All of the North Korean refugee students (N = *90*) were invited to participate in this study following the agreement and cooperation of the organization's leaders. Two researchers administered the questionnaires to participants in their classrooms. Prior to

administration, the researcher explained the aim and content of the study, procedure, risks and confidentiality. Participants who volunteered to take part in the study and signed an informed consent formwere then included in this study. For minors an informed consent form signed by their legal guardian was required as well. Participants were asked to complete questionnaires about traumatic experience, post-traumatic stress disorder, depression and insomnia symptoms which were written in Korean. If participants had questions about the questionnaire items, the researcher gave a detailed explanation and clarified the items. During the administration of the study participants were asked to sit away from each other to ensure privacy. Completing the questionnaires required about 40 minutes. The ethical review board of the University of Konstanz approved the present study.

Instruments

Trauma Exposure

The trauma event checklist of the University of California at Los Angeles PTSD Reaction Index for Children/Adolescents for the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (UCLA-PTSD-RI-V) (28) was used for the assessment of exposure to trauma. The checklist contains 14 items covering different traumatic event types. In the present study, the number of different types of traumatic events reported by the participant was defined as the level of exposure to trauma, because PTSD prevalence was most accurately predicted by the number of different traumatic event types experienced (7).

PTSD Symptoms

The symptom severity of PTSD was assessed with the UCLA PTSD Reaction Index for C/A DSM-5 (the revised version of the UCLA PTSD RI for DSM-4) (28). The new DSM-5 version consists of 27 items measuring PTSD symptoms corresponding to B, C, D, and E criteria and four additional items assessing dissociative subtype. Each item can be rated from 0 (none) to 4 (most of the time) based on the frequency of symptoms in the past month. In the current study, the severity of PTSD was calculated by summing up the scores of all items of PTSD symptoms (range, 0–80). According to the instructions, the cutoff score for considering PTSD is 38. For the current study, two independent Korean-speaking translators translated the UCLA PTSD Index for DSM-5 (UPID) into Korean, and then another translator, who is bilingual in Korean and English, translated it back into English. A Korean clinical psychologist corrected and confirmed discrepancies. Cronbach's α for the UCLA PTSD RI in the current sample was .95.

Depression Symptoms

The Patient Health Questionnaire-9 (PHQ-9) (29) is a nine-item self-report questionnaire assessing the severity of depression. Each item can be rated from 0 (not at all) to 3 (nearly every day) based on the frequency of symptoms over the last 2 weeks. The sum of all nine items was defined as the severity of depression symptoms (range, 0–27) in the present study. Following the instructions for the PHQ-9 (30, 31), a total score of ≥10 is regarded as indicative of severe depression and the cutoff score for considering treatment. The Korean version of the PHQ-9 has been shown to be an appropriate self-report diagnostic tool for assessing depression (32). Cronbach's α of the PHQ-9 sum score was .86 in the current sample.

Insomnia Symptoms

The Insomnia Severity Inventory (ISI) (33, 34) is a seven-item self-report questionnaire measuring sleep difficulties. Each item can be rated from 0 (no problem) to 4 (very severe problem) based on the nature, severity, and impact of sleep difficulties in the past months. The items assess severity of sleep onset, sleep maintenance, early morning awakening problems, sleep dissatisfaction, inference of sleep difficulties with daytime functioning, noticeability of sleep problems by others, and distress caused by the sleep difficulties. The total sum score is defined as the symptom severity of insomnia (range, 0–28) and interpreted as follows: absence of insomnia (0–7), subthreshold insomnia (8–14), moderate insomnia (15–21), and severe insomnia (22–28). The Korean version of the ISI has been shown to be a clinically useful instrument for assessing the severity of insomnia with good psychometric properties (35). Cronbach's α in the sample was .83.

Statistical Analysis

Data analyses were performed using IBM SPSS version 25.0 and AMOS version 24.0. Associations between variables and group differences with regard to sociodemographic variables were examined using either the chi-square test or *t* test. Pearson correlations were used to examine the relations between PTSD, depression, and insomnia symptoms. A path analysis was used to predict insomnia in a single model. Potential impact on results due to symptom overlap between PTSD and depression could be excluded in preliminary analyses. The following indices with recommending values assessed adequacy of model fit: chi-square; root mean square error of approximation (RMSEA), with values below .08 (36); standardized root mean square residual (SRMR), with values less than.05 (37); and goodness-of-fit statistic (GFI) and adjusted goodness-of-fit statistic (AGFI), with values close to .90 or higher. For GFI, a higher cutoff of .95 is recommended, when sample sizes are low (38).

RESULTS

High rates of multiple trauma exposures were found in our sample. The mean number of traumatic event types was 4.5 (SD = 2.4) with a maximum number of 10. Note that the actual occurrence of traumatic stressors can be much higher, as one type may have been experienced multiple times. The majority (91%) reported having experienced more than two traumatic events and about half (49%) reported having been exposed to more than five different types of traumatic stressors. The five most frequent types were having anyone close to me died (56.8%); seeing a family member being hit, punched, or kicked at home (48.6%); being hit, punched, or kicked at home (40.5%); seeing a dead body (36.5%); and being in an accident (35.1%). Additionally, 68.9% of the total sample reported having other traumatic experiences that are not described in the trauma list of the UPID.

The mean score was 28.43 (SD = 16.69) for PTSD symptoms and 9.81 (SD = 5.90) for depression symptoms. For insomnia symptoms, the mean score was 13.19 (SD = 5.58).

Thirty percent of the sample (n = 22) met the cutoff score for PTSD symptoms. Fourteen of them also presented with scores for depression and insomnia above the cutoff.

Figure 1 illustrates the high rates of co-occurring symptoms of PTSD and insomnia in those who have multiple trauma.

The correlations among the mental health outcome variables are presented in **Table 1**. The scores of the overall symptoms and the four diagnostic cluster symptoms of PTSD were positively correlated with the score of depression and insomnia symptoms ($p < .001$).

Results of path analysis indicated satisfactory fit to the proposed model, χ^2 (1, n = 74) = .13, p = .72; RMSEA = .00; SRMR = .01; GFI = 1.0; AGFI = .99. In the path model, PTSD and depression symptom severity fully mediated the relation between trauma exposure and insomnia symptoms (**Figure 2**). PTSD was significantly associated with depression symptom severity, but not insomnia symptom severity. Trauma exposure was related to PTSD, but not insomnia symptom severity.

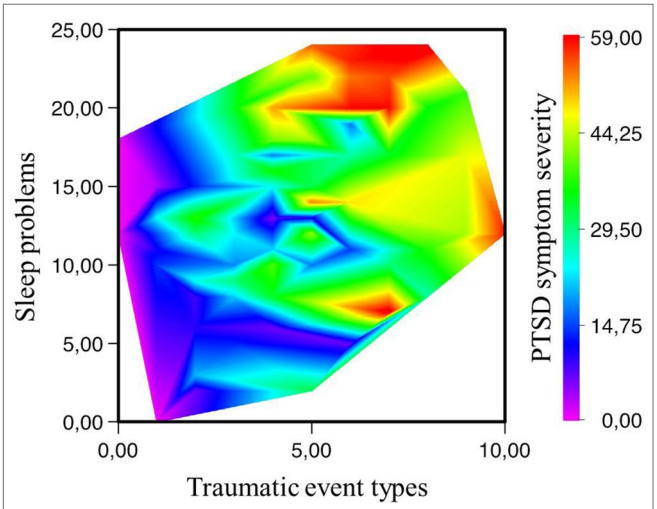

FIGURE 1 | The relationship between the number of traumatic event types and insomnia according to the posttraumatic stress disorder (PTSD) symptom severity. There are no data in the lower right corner (i.e., all respondents who report high numbers of traumatic events also present with sleep problems) and in the upper left corner (sleep problems do not reach extreme values in those with few traumata). *Note*: Sleep problems, the ISI sum score; PTSD symptom severity, the UPID sum score.

DISCUSSION

The aim of the present study was to examine the associations between trauma exposure, PTSD, depression, and insomnia in a sample of North Korean refugee youth. As expected, the present study revealed high rates of PTSD and currently co-occurring insomnia symptoms among the refugee youth who have experienced a greater number of traumatic events. This is in line with previous findings of high comorbidity rates of PTSD and other mental health symptoms in refugees and war-affected populations (16–17, 18, 39). This is also consistent with studies showing a close relationship between multiple traumatic events and enhanced likelihood of comorbid psychiatric symptoms (40, 41). Moreover, we found positive correlations between PTSD, depression, and insomnia. Specifically, insomnia was strongly related not only to hyperarousal but also to other symptom clusters of PTSD. Results of the path analysis supported the hypothesized associations among trauma exposure, PTSD, depression, and insomnia. The path model indicated that trauma exposure affected insomnia symptom severity through trauma-related symptoms, i.e., PTSD and depression. This confirms the previous finding of a dose–response relationship between exposure to multiple traumatic events and insomnia (11, 15). Our findings are also consistent with studies showing that PTSD provides a link between trauma exposure and depression (3, 16, 17, 20, 39). Furthermore, PTSD affected insomnia symptom severity only through depression in the path model. This suggests that elevated levels of sleep problems in refugee populations may be explained by trauma-related symptoms, especially depression. Therefore, we argue that the presence of depression associated with PTSD increases the risk for developing sleep problems in refugees. In other words, the greater the levels of PTSD suffered, the greater the likelihood for developing sleep problems *via* depression.

Our findings have important clinical implications. First, the present study indicates that the identification of depression associated with PTSD is needed to identify potential candidates that may develop sleep problems later on. In terms of early stage assessment, clinicians and professionals could pay attention to

TABLE 1 | Correlations between mental health outcomes.

	1	2	3	4	5	6	7
1. Overall PTSD symptoms	—						
2. PTSD intrusion	.88	—					
3. PTSD avoidance	.78	.70	—				
4. PTSD alterations in cognition/emotion	.92	.70	.65	—			
5. PTSD alterations in arousal and reactivity	.87	.68	.55	.72	—		
6. PTSD dissociation symptoms	.69	.62	.41	.70	.55	—	
7. Insomnia symptoms	.56	.42	.39	.53	.55	.43	—
8. Depression symptoms	.77	.62	.54	.78	.65	.59	.59

All correlations are significant at p < .001.
PTSD, posttraumatic stress disorder.

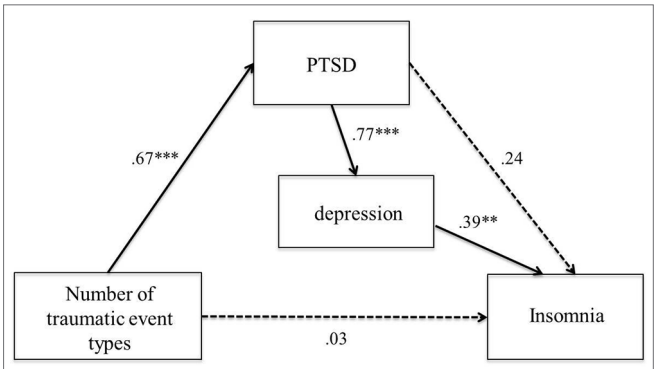

FIGURE 2 | Model representing the associations between trauma exposure, PTSD, depression, and insomnia (n = 74). *Note:* Standardized regression weights for all hypothesized paths are presented. Nonsignificant paths are indicated with dotted lines. Error variables are omitted for clarity. ** $p < .01$, *** $p < .001$.

assess depression associated with PTSD to screen individuals with higher risk of sleep problems. Second, in the context of intervention strategy, our findings may be useful to indicate which symptoms should be targeted first to reduce sleep problems of refugees. For example, if sleep problems are related to the presence of depression associated with PTSD, a failure to treat sleep problems may thus be due to persistence of PTSD symptoms. Finally, from the viewpoint of posttreatment evaluation, the improvement of sleep problems may be indicative of good treatment outcomes in the treatment of trauma-related psychological disorders. Weinhold et al. (12) argue that improvement in sleep quality can be considered as an important condition for treatment outcome regarding PTSD symptoms. Considering our finding of the relation between PTSD, depression, and insomnia, treating PTSD may result in improvement in depression symptoms, leading to improved sleep.

There are limitations to the present study. First, the limited sample size may have reduced the accuracy of the statistics. However, values for all indices in the path model represented good model fit with a higher cutoff that is recommended when sample size is small. In addition, our measure was based on retrospective self-report and self-reported symptoms that may include some reporting bias.

The present study extends the existing knowledge and study of sleep problems of refugees and indicates how sleep problems relate to trauma-related symptoms, i.e., PTSD and depression. Our findings call for further investigation of the specific relationship between sleep problems and trauma-related symptoms, leading to more effective evaluation and intervention for refugee populations.

ETHICS STATEMENT

All of the North Korean refugee students (N = 90) were invited to participate in this study following the agreement and cooperation of the organization's leaders. Two researchers administered the questionnaires to participants in their classrooms. Prior to administration, the researcher explained the aim and content of the study, procedure, risks, and confidentiality. Participants who volunteered to take part in the study and signed an informed consent form were then included in this study. For minors, an informed consent form signed by their legal guardian was required as well. The ethical review board of the University of Konstanz approved the present study.

AUTHOR CONTRIBUTIONS

All authors developed the study concept and design. JP (1st author) and JP (4th author) conducted data collection under the supervision of SK. JP (1st author) performed the statistical analyses and drafted the paper. TE supervised the data analyses and interpretation of findings. All authors approved the final version of the manuscript.

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CORRECTION
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Corrigendum: The Contribution of Posttraumatic Stress Disorder and Depression to Insomnia in North Korean Refugee Youth

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Keywords: multiple trauma, posttraumatic stress disorder, insomnia, depression, North Korean refugee youth

A Corrigendum on

The Contribution of Posttraumatic Stress Disorder and Depression to Insomnia in North Korean Refugee Youth

by Park J, Elbert T, Kim SJ and Park J (2019). Front. Psychiatry 10:211. doi: 10.3389/fpsyt.2019.00211

In the original article, there was an error. The name of the Ethical Review Committee was not included in the procedure section. Instead of "(edited out for blind review)", it should be "University of Konstanz".

A correction has been made to the **Materials and Methods,** subsection **Procedure**:

> "Participants were recruited from a specialized school for North Korean refugee youth, which offers middle and high school education in South Korea. Anyone who is a North Korean refugee youth can apply to this school and will be assigned to this school selectively according to the decision of the school board. All of the North Korean refugee students (N = 90) were invited to participate in this study following the agreement and cooperation of the organization's leaders. Two researchers administered the questionnaires to participants in their classrooms. Prior to administration, the researcher explained the aim and content of the study, procedure, risks and confidentiality. Participants who volunteered to take part in the study and signed an informed consent form were then included in this study. For minors an informed consent form signed by their legal guardian was required as well. Participants were asked to complete questionnaires about traumatic experience, post-traumatic stress disorder, depression and insomnia symptoms which were written in Korean. If participants had questions about the questionnaire items, the researcher gave a detailed explanation and clarified the items. During the administration of the study participants were asked to sit away from each other to ensure privacy. Completing the questionnaires required about 40

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minutes. The ethical review board of the University of Konstanz approved the present study."

The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

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ORIGINAL RESEARCH
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Significant PTSD and Other Mental Health Effects Present 18 Months After the Fort Mcmurray Wildfire: Findings From 3,070 Grades 7–12 Students

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Background: The May 2016 wildfire in Fort McMurray, Alberta, Canada forced evacuation of the population of 88,000 individuals and destroyed 10% of the homes. Youth are particularly impacted by disaster.

Methods: Eighteen months after the wildfire, Fort McMurray Public and Catholic Schools surveyed 3,252 of the 4,407 students in Grades 7–12 to determine possible long-term psychological impacts. The survey included validated measurement scales for post-traumatic stress disorder (PTSD), depression, anxiety, use of drugs, alcohol, and tobacco, quality of life, self-esteem, and resilience. Data analysis was possible for only 3,070 students, i.e., 70% of the total student population. Anonymized data were analyzed to compare students who directly experienced lesser or greater impact from the wildfire, with greater impact defined as personally seeing the fire or having one's home destroyed. Also, students with greater or lesser scores on the Child and Youth Resilience Measure (CYRM-12) were compared.

Results: Of the 3,070 students, 37% met criteria for probable PTSD; 31% met criteria for probable depression, and 17% for probable depression of at least moderate severity; 27% of students met criteria for probable anxiety, and 15% for probable alcohol or substance use disorder; 46% of all students met criteria for one or more probable diagnosis of PTSD, depression, anxiety, or alcohol/substance abuse, and this included students who were both present and not present in Fort McMurray at the time of the wildfire. Students with greater impact from the wildfire exhibited significantly higher scores on measures of PTSD, depression, anxiety, and alcohol/substance use. They also had lower self-esteem and quality of life scores. Students with lower resilience scores exhibited a similar pattern.

Conclusions: These findings highlight first the negative impact of disasters on youth mental health, particularly for those who directly experience wildfire, and second the role of resilience on youth mental health, with lower resilience associated with substantially lower mental health outcomes. These results emphasize the need for long-term mental

health supports for youth post-disaster, with specific focus on increasing youth resilience, which may serve as a protective factor against effects of disaster on mental health.

Keywords: youth, mental health, wildfire, disaster, post-traumatic stress disorder, depression, anxiety, substance use and misuse

INTRODUCTION

On May 3, 2016, a large wildfire, called "The Beast" in the popular media (1), forced the population of 88,000 living in Fort McMurray, Alberta, Canada to evacuate. The fire destroyed 10% of the homes in Fort McMurray and burned 590,000 hectares of land before being contained. The Insurance Bureau of Canada indicated that the cost of the Fort McMurray wildfire was estimated at $3.6 billion, making this the most expensive insured catastrophe in Canadian history (2). After evacuation, many individuals were displaced because their homes were damaged or made otherwise unfit for habitation by the fire. Many individuals also faced job loss and unemployment due to the damage and closure of local businesses. In addition to physical damage to local infrastructure, the community was affected by social, emotional, and psychological difficulties that are often present after a disaster (3). Youth in particular are affected by disasters given their dependence on adults, structural vulnerabilities, as well as physical, psychological, and social factors related to the youth developmental stage. However, little research has examined the impact of disasters on the mental health and well-being of youth.

Wildfires have a negative impact on the mental health of local residents in the affected areas, as indicated by previous studies and lived experience. Studies looking at both adults and children have reported that both groups exhibit an increased incidence of post-traumatic stress disorder (PTSD) (4) and increased symptoms of depression and stress (5). Studies focusing specifically on adults indicate that adults exhibit increased incidence of PTSD (6, 7), increased symptoms of depression and anxiety (7, 8), increased levels of psychological distress (9), and increased consumption of anxiolytics hypnotics (10). Studies of children and youth show that these groups exhibit increased incidence of PTSD and depression (11, 12).

In a broader context, non-wildfire disasters, including floods, earthquakes, and tsunamis, also have an adverse effect on mental health [see review in Goldmann and Galea (13) and Kar (14)]. Disasters are thought to cause increased incidence of PTSD, major depressive disorder, generalized anxiety disorder, and substance use disorder in children and adults. Tang et al. (15) also suggest an association between disasters and increased depression. Earthquakes have also been linked with increased incidence of PTSD (16). Some studies report an increase in suicide months or years after natural disasters [reviewed in Ref. (17)]. These patterns are particularly concerning because an individual's ability or lack of ability to cope with adversity during and after a disaster plays an important role in determining long-term mental health outcomes.

Despite mental health and well-being challenges resulting from disasters, resilience plays an important role in the lives of children and youth by serving as a protective factor that mitigates the effects of disaster on mental health. Resilience refers to an individual's capacity to handle adverse life experiences based on their mindset, resourcefulness, and support from family, friends, and community (18, 19). Higher resilience, in the form of reliance on family and friends, has been associated with buffering of the negative effects of wildfire (9, 20). Characteristics associated with non-resilience, including low socio-economic status, low social support, and poor relationships, have been linked with greater risk of psychopathology post-disaster (13, 21). Conversely, pro-resilience characteristics such as self-efficacy, optimism, hardiness, higher perceived ability to cope, and flexible adaptive responses are associated with reduced psychological symptoms after disasters (13). This is particularly important given that children and youth have been identified as being more vulnerable to psychopathology after disasters (13).

To our knowledge, only one previous study prior to 2019 examined the impact of wildfires on youth mental health at a population level, focusing on PTSD and depression (12). Our goal is to address the need to build more empirically informed evidence at the population level about the specific ways that youth's mental health is impacted by disasters. We provide further insight into the mental health effects of wildfires on youth by focusing on PTSD, depression, anxiety, alcohol/substance use, and resilience.

By analyzing school mental health survey data collected by Fort McMurray Public and Catholic School boards in November 2017 (18 months after the 2016 wildfire), we were able to help determine the overall population mental health effects in youth. This analysis allowed specific insights into measures of symptoms indicative of PTSD, depression, anxiety, alcohol and substance misuse, tobacco use, levels of self-esteem, quality of life, and resilience. In addition to capturing information on the mental health effects using standardized scales, the Fort McMurray schools were interested in understanding how other factors may influence these measurements. Therefore, in the survey, youth were also asked specific questions about their personal exposure to the wildfire and about the direct impact the wildfire had on their lives, including if they were present and witnessed the wildfire when it occurred, as well as if their own home was destroyed by the wildfire.

We published an initial analysis (22) of the November 2017 Fort McMurray mental health survey dataset, investigating

Abbreviations: CPSS, Child PTSD Symptom Scale; CRAFFT, CRAFFT Questionnaire (proper name of the questionnaire is CRAFFT); CYRM-12, Child and Youth Resilience Measure; EMPATHY, Empowering a Multimodal Pathway Towards Healthy Youth project; FDR, false discovery rate; HADS, Hospital Anxiety and Depression Scale; Kidscreen-10, Kidscreen Questionnaire; PHQ-A, The Patient Health Questionnaire, Adolescent version; PTSD, post-traumatic stress disorder; Rosenberg, Rosenberg Self-Esteem Scale.

depression, anxiety, alcohol/substance misuse, self-esteem, and quality of life and comparing the Fort McMurray data to a control (non-disaster) dataset collected from Red Deer, Alberta. This initial study found that symptoms of depression and anxiety were higher in the Fort McMurray sample than in the Red Deer sample [see Figure 2 in Ref. (22)]. Rates of probable depression were higher in Fort McMurray, though rates of probable anxiety and probable alcohol/substance use disorder were not significantly different. Self-esteem and quality of life scores were lower in the Fort McMurray group. The initial study (22) did not compare PTSD symptoms between Fort McMurray and Red Deer, as the Red Deer mental health survey did not include a PTSD measure.

The current study presents an extended analysis of the Fort McMurray dataset, including an investigation of PTSD as well as examining the effects of severity of impacts from the 2016 wildfire experienced by different individuals on PTSD, depression, anxiety, alcohol/substance misuse, self-esteem, quality of life, and resilience.

Based on previous research, our hypotheses were that more serious exposure to the wildfire and more direct impacts from the wildfire would have greater negative effects on youth's mental health. More specifically, we hypothesized that these youth would have higher risk of having clinically significant scores on measures of PTSD, depression, anxiety, and alcohol/substance misuse, while having lower scores on measures of self-esteem, quality of life, and resilience.

MATERIALS AND METHODS

Overview and Ethical Considerations

The two school boards in Fort McMurray—Fort McMurray Public Schools and Fort McMurray Catholic Schools—asked all students in Grade 7–Grade 12 to complete a comprehensive survey of their mental health, in November 2017, 18 months after the 2016 wildfire. The survey was conducted to enable the school boards to evaluate the effectiveness of the programs that they put in place immediately following the wildfire (for details, see Appendix—Mental Health Support Programs in the **Supplementary Materials**). The November 2017 survey time was determined by the schools based on logistical and staff capacity considerations. All aspects of survey data collection, including participant consent, were administered by Fort McMurray Public Schools and Fort McMurray Catholic Schools, in accordance with their standard procedures and policies. Researchers from the University of Alberta were asked to assist in designing the survey and analyzing the survey data. After the survey data were collected by the schools, researchers from the University of Alberta analyzed an anonymized version of the data. Survey data analysis was approved by the University of Alberta's Health Research Ethics Board on June 26th, 2017 (ethics protocol number Pro00072669).

The survey included questions to determine demographics, mental health, resilience, and personal exposure to and direct impacts of the wildfire. All survey data were collected by the two Fort McMurray school systems, under their ethical guidelines and supervision. The survey was administered as part of the schools' standard curriculum to assess the educational and support programs they established after the wildfire. The selection of measurement instruments was made by the school systems, informed by the existing literature in this context as well as expert advice from the University of Alberta research team. Parents and guardians were made aware of the survey by written letter 2 weeks prior to survey administration in the schools. Parents/guardians had the option to opt their child(ren) out of the survey if they desired. Students, themselves, had the option to participate or not in the survey, which was explained at the start of each survey data collection session (see details below as well as the survey description script in the **Supplementary Material**). Survey participation was anonymous, and participants were not asked for their names. This paper presents an analysis of the survey data collected from both school boards.

Survey Questionnaires

The survey included the following 10 questionnaires (**Table 1**):

1. Demographics Questionnaire (Demographics, 7 questions) was a custom questionnaire assessing age, gender, the student's grade, and school.
2. The Impact of Fire Questionnaire (IOF, 6 questions) was a custom questionnaire assessing the impact of the 2016 wildfire on the student, including whether they were present in Fort McMurray during the fire, whether they were evacuated, whether they personally saw the fire, and whether their home was destroyed.
3. Child PTSD Symptom Scale (CPSS, 19 questions) assesses symptoms of PTSD (23) and generates a score of PTSD symptom severity from 0 to 51.
4. The Patient Health Questionnaire, Adolescent version (PHQ-A, 11 questions) assesses symptoms of depression and suicidality (24, 25) and generates a score for depression symptom severity from 0 to 27.
5. The Hospital Anxiety and Depression Scale (HADS, 7 questions, anxiety-related questions only) assesses symptoms of anxiety (26) and generates a score for anxiety symptom severity from 0 to 21.
6. The CRAFFT Questionnaire (CRAFFT, 9 questions) assesses symptoms of alcohol and substance misuse (27, 28) and generates a score of alcohol/substance misuse severity from 0 to 6.
7. Tobacco Use Questionnaire (2 questions) includes two questions on tobacco use: "Over the past month: Do you smoke tobacco products? Do you use smokeless tobacco products?"
8. The Rosenberg Self-Esteem Scale (Rosenberg, 10 questions) assesses self-esteem (29) and generates a self-esteem score from 0 to 30.
9. The Kidscreen Questionnaire (Kidscreen-10, 11 questions) assesses quality of life (30) and generates a quality of life score from 0 to 44.
10. The Child and Youth Resilience Measure (CYRM-12, 12 questions) assesses resilience to adverse experience or trauma (31) and generates a resilience score from 12 to 60.

TABLE 1 | Questionnaire details.

Demographics Questionnaire		
	Questions	Answer choices
1	Are you at school right now, while you are taking the survey?	Yes, no
2	Are you a student?	Yes, no
3	What gender do you identify with?	Female, male, other, prefer not to say
4	What is your age in years?	10 years or less, 11 years, 12 years, 13 years, 14 years, 15 years, 16 years, 17 years, 18 years, 19 years, 20 years or more
5	What is your school?	7, 8, 9, 10, 11, 12, other
6	What grade are you in?	Select from a list of all Ft McMurray schools with any classes in grades 7-12
7	What school were you in for grade 6?	Select from a list of all Ft McMurray schools with grade 6
Impact of Fire Questionnaire		
	Questions	Answer choices
1	Were in you or near Fort McMurray during any part of the 2016 wildfire?	Yes, no
2	Did you evacuate because of the fire?	Yes, no
3	Was your home destroyed by the fire?	Yes, no
4	Did you see the fire in person?	Yes, no
5	What school are you in?	Select from a list of all Ft McMurray schools with any classes in grades 7-12
6	What grade are you in?	7, 8, 9, 10, 11, 12, other
Patient Health Questionnaire (PHQ-A, Depression Symptoms)		
	Questions	Answer choices
	Over the past 2 weeks, how often have you been bothered by any of the following problems?	
1	Feeling down, depressed, irritable or hopeless	Not at all, Several days, More than half the days, Nearly every day
2	Little interest or pleasure in doing things?	Not at all, Several days, More than half the days, Nearly every day
3	Trouble falling or staying asleep, or sleeping too much	Not at all, Several days, More than half the days, Nearly every day
4	Poor appetite, weight loss, or overeating?	Not at all, Several days, More than half the days, Nearly every day
5	Feeling tired, or having little energy?	Not at all, Several days, More than half the days, Nearly every day
6	Feeling bad about yourself-or that you are a failure or that you have let yourself or your family down	Not at all, Several days, More than half the days, Nearly every day
7	Trouble concentrating on things, such as school work, reading or watching television	Not at all, Several days, More than half the days, Nearly every day
8	Moving or speaking so slowly that other people could have noticed. Or the opposite-being so figety or restless that you have been moving around a lot more than usual	Not at all, Several days, More than half the days, Nearly every day
9	Thoughts that you would be better off dead, or of hurting yourself in some way	Not at all, Several days, More than half the days, Nearly every day
	Questions 10 and 11 asked only if answer to question 9 was "Several days", "More than half the days", or "Nearly everday"	
10	Has there been a time in the past month when you have had serious thoughts about ending your life?	Yes, no
11	Have you ever, in your WHOLE LIFE, tried to kill yourself or made a suicide attempt?	Yes, no
Hospital Anxiety and Depression Scale (HADS, Anxiety Symptoms)		
	Questions	Answer choices
	Tick the box beside the reply that is closest to how you have been feeling in the past week. Don't take too long over you replies: your immediate is best.	
1	I feel tense or wound up:	Most of the time; A lot of the time; From time to time, occasionally; Not at all
2	I get a sort of frightened feeling as if something bad is about to happen:	Very definitely and quite badly; Yes, but not too badly; A little, but it doesn't worry me; Not at all
3	Worrying thoughts go through my mind:	A great deal of the time; A lot of the time; From time to time, but not too often; Only occasionally
4	I can sit at ease and feel relaxed:	Definitely; Usually; Not often; Not at all
5	I get a sort of frightened feeling like 'butterflies' in the stomach:	Not at all; Occasionally; Quite often; Very often
6	I feel restless and have to be on the move:	Very much indeed; Quite a lot; Not very much; Not at all
7	I get sudden feelings of panic:	Very often indeed; Quite often; Not very often; Not at all

(Continued)

TABLE 1 | Continued

Child PTSD Symptom Scale (CPSS)		
	Questions	Answer choices
	Instructions to participant: Below is a list of problems that kids sometimes have after experiencing an upsetting event. Read each one carefully and circle the number (0–3) that best describes how often that problem has bothered you IN THE LAST 2 WEEKS.	
1	Please select your most distressing event:	2016 Fort McMurray wildfire; Death of someone close to you; Injury that you suffered; Physical assault against you; Sexual assualt; Other
2	How long as it been since the event (in years)?	less than 1 month; 2-5 months; 6-11 months; 1 year; 2 years; 3-5 years; 6-10 years; 11 or more years
	Below is a list of problems that kids sometimes have after experiencing an upsetting event. Read each one carefully and circle the number (0–3) that best describes how often that problem has bothered you IN THE LAST 2 WEEKS.	
3	Having upsetting thoughts or images about the event that came into your head when you didn't want them to	Not at all or only at one time; Once a week or less/ once in a while; 2 to 4 times a week/ half the time; 5 or more times a week/almost always
4	Having bad dreams or nightmares	Same as above
5	Acting or feeling as if the event was happening again (hearing something or seeing a picture about it and feeling as if I am there again)	Same as above
6	Feeling upset when you think about it or hear about the event (for example, feeling scared, angry, sad, guilty, etc)	Same as above
7	Having feelings in your body when you think about or hear about the event (for example, breaking out into a sweat, heart beating fast)	Same as above
8	Trying not to think about, talk about, or have feelings about the event	Same as above
9	Trying to avoid activities, people, or places that remind you of the traumatic event	Same as above
10	Not being able to remember an important part of the upsetting event	Same as above
11	Having much less interest or doing things you used to do	Same as above
12	Not feeling close to people around you	Same as above
13	Not being able to have strong feelings (for example, being unable to cry or unable to feel happy)	Same as above
14	Feeling as if your future plans or hopes will not come true (for example, you will not have a job or getting married or having kids)	Same as above
15	Having trouble falling or staying asleep	Same as above
16	Feeling irritable or having fits of anger	Same as above
17	Having trouble concentrating (for example, losing track of a story on the television, forgetting what you read, not paying attention in class)	Same as above
18	Being overly careful (for example, checking to see who is around you and what is around you)	Same as above
19	Being jumpy or easily startled (for example, when someone walks up behind you)	Same as above
CRAFFT Questionnaire (Drugs/Alcohol/Tabacco)		
	Questions	Answer choices
	During the past 12 months, did you:	
1	Drink any alcohol (more than a few sips)?	Yes, no
2	Smoke any marijuana or hashish?	Yes, no
3	Use anything else to get high?	Yes, no
4	Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs?	Yes, no
	Questions 5-9 asked only if "yes" to one or more of questions 1-3.	
5	Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?	Yes, no
6	Do you ever use alcohol or drugs while you are by yourself, or ALONE?	Yes, no
7	Do you every FORGET things you did while using alcohol or drugs?	Yes, no
8	Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?	Yes, no
9	Have you ever gotten into TROUBLE while you were using alcohol or drugs?	Yes, no
Tobacco Use Questionnaire		
	Questions	Answer choices
	During the past month:	
1	Do you smoke tobacco products?	Yes, no
2	Do you use smokeless tobacco products?	Yes, no
Rosenberg Self-Esteem Scale		
	Questions	Answer choices
1	On the whole, I am satisfied with myself.	Strongly agree, Agree, Disagree, Strongly disagree
2	At times, I think I am no good at all.	Strongly agree, Agree, Disagree, Strongly disagree

(Continued)

TABLE 1 | Continued

3	I feel that I have a number of good qualities.	Strongly agree, Agree, Disagree, Strongly disagree
4	I am able to do things as well as most other people.	Strongly agree, Agree, Disagree, Strongly disagree
5	I feel I do not have much to be proud of.	Strongly agree, Agree, Disagree, Strongly disagree
6	I certainly feel useless at times.	Strongly agree, Agree, Disagree, Strongly disagree
7	I feel that I'm a person of worth, at least on an equal plane with others.	Strongly agree, Agree, Disagree, Strongly disagree
8	I wish I could have more respect for myself.	Strongly agree, Agree, Disagree, Strongly disagree
9	All in all, I am inclined to feel that I am a failure.	Strongly agree, Agree, Disagree, Strongly disagree
10	I take a positive attitude toward myself.	Strongly agree, Agree, Disagree, Strongly disagree
Kidscreen Questionnaire (Quality of Life)		
	Questions	Answer choices
	Thinking about the last week:	
1	Have you physically felt fit and well?	Not at all, slightly, moderately, very, extremely
2	Have you felt full of energy?	Never, seldom, quite often, very often, always
3	Have you felt sad?	Never, seldom, quite often, very often, always
4	Have you felt lonely?	Never, seldom, quite often, very often, always
5	Have you had enough time for yourself?	Never, seldom, quite often, very often, always
6	Have you been able to do the things that you want to do in your free time?	Never, seldom, quite often, very often, always
7	Have your parent(s) treated you fairly?	Never, seldom, quite often, very often, always
8	Have you had fun with your friends?	Never, seldom, quite often, very often, always
9	Have you got on well at school?	Not at all, slightly, moderately, very, extremely
10	Have you been able to pay attention?	Never, seldom, quite often, very often, always
11	In general, how would you say your health is?	Excellent, very good, good, fair, poor
Child and Youth Resilience Measure (CYRM-12)		
	Questions	Answer choices
	To what extent do the sentences below describe you? Select an answer for each statement.	
1	I am able to solve my problems without harming myself or others	Not at all; A little; Some-what; Quite a bit; A lot
2	I know where to go in the community to get help	Not at all; A little; Some-what; Quite a bit; A lot
3	Getting an education is important to me	Not at all; A little; Some-what; Quite a bit; A lot
4	I try to finish what I start	Not at all; A little; Some-what; Quite a bit; A lot
5	I have people I look up to	Not at all; A little; Some-what; Quite a bit; A lot
6	My parents/caregivers know a lot about me	Not at all; A little; Some-what; Quite a bit; A lot
7	My family stands by me during difficult times	Not at all; A little; Some-what; Quite a bit; A lot
8	My friends stand by me during difficult times	Not at all; A little; Some-what; Quite a bit; A lot
9	I have opportunities to develop skills that will be useful later in life	Not at all; A little; Some-what; Quite a bit; A lot
10	I am treated fairly in my community	Not at all; A little; Some-what; Quite a bit; A lot
11	I feel I belong at school	Not at all; A little; Some-what; Quite a bit; A lot
12	I enjoy my cultural and family traditions	Not at all; A little; Some-what; Quite a bit; A lot

Survey Administration Procedure

Students participated in the survey during regular school hours in the vast majority of cases. (A few students with special circumstances participated from home, using their own computers.) Each participant used a laptop or desktop computer to fill in the survey. The survey website used an HTML/CSS front-end and a back-end server written in the Clojure programming language (http://clojure.org). (Clojure was chosen as the server language for its high productivity with small development teams and strong track record in web applications.) Students either came to a computer laboratory or used laptops brought to their classroom, depending on their school. A survey description script was read to each class at the beginning of each survey session (reproduced in the **Supplementary Material**). The script explained the purpose of the survey, how to complete the survey, participant confidentiality, anonymity, and voluntary participation. Students' confidential, anonymous, and voluntary participation in the survey was emphasized. Before participating, students were also given the opportunity to ask questions. Survey participation was anonymous, and the survey did not ask participants for their names. The survey battery included a total of 96 questions. Participation required less than 20 min for most students, though a small number of students took up to 50 min. Participants were able to skip questions, although the survey description script encouraged them to answer all questions.

Cutoff Scores and Probable Diagnoses

For each participant, we derived probable diagnoses of four different psychiatric conditions from the participant's questionnaire answers on specific scales, combined with previously established cutoff points for probable diagnoses appropriate to each scale. Specifically, we considered PTSD (from the CPSS scale), depression (from PHQ-A), anxiety (from HADS), and alcohol/substance use disorder (from CRAFFT). We use the term "probable diagnosis" because scores were based on self-report scales, not psychiatric clinical interviews, and scores on a specific scale are not clinically diagnostic. Nonetheless, existing literature reports good correspondence between psychiatric clinical diagnoses of PTSD, depression, anxiety, and alcohol/substance use disorder with probable diagnoses based on

widely published cutoff scores for the above four scales (27, 28, 32–35). Each of the four probable diagnoses was defined based on a threshold value for the appropriate scale. Thus, probable PTSD was defined as having a CPSS score of 15 or more (35, 36). Probable depression was defined as having a PHQ-A score of 11 or more (33). Probable moderately severe depression was defined as having a PHQ-A score of 15 or more (32). Suicidal thinking was assessed from responses to questions 9 and 10 from the PHQ-A: question 9 "Over the past 2 weeks, how often have you been bothered by any of the following problems: Thoughts that you would be better off dead, or of hurting yourself in some way?" and question 10 "Has there been a time in the past month when you have had serious thoughts about ending your life?" Participants were defined as positive for suicidal thinking if they answered "Several days," "More than half the days," or "Nearly every day" to PHQ-A question 9 and "Yes" to question 10. Participants who answered "Not at all" to question 9 were not given question 10 and were defined as negative for suicidal thinking. Participants who answered "Several days," "More than half the days," or "Nearly every day" to PHQ-A question 9 and "No" to question 10 were defined as negative for suicidal thinking (as distinct from thinking about self-harm). (PHQ-A question 11 was not considered in the definition of suicidal thinking.) Probable anxiety was defined as having a HADS score of 11 or more (34). Probable alcohol/substance use disorder was defined as having a CRAFFT score of 2 or more (27, 28). Tobacco use was defined as answering "yes" to either of the two questions on the Tobacco Use Questionnaire. We also defined an "Any of 4 probable diagnoses" criterion as being positive for one or more of the four probable diagnoses: PTSD, depression, anxiety, or alcohol/substance use disorder.

Statistical Analysis

We defined five pairs of subgroups from participants, namely: 1) no impact of fire vs. any impact of fire; 2) present during the fire vs. not present; 3) saw the fire in person vs. did not see it; 4) home destroyed by the fire vs. home not destroyed; and 5) high resilience vs. low resilience.

1) No impact of fire vs. any impact of fire: The no impact of fire group was defined as those participants answering "no" to the following four questions: "Were you in or near Fort McMurray during any part of the 2016 wildfire?," "Did you evacuate because of the fire?," "Did you see the fire in person?," "Was your home destroyed by the fire?" The any impact of fire group was defined as those participants who answered "yes" to any one or more of those four questions. Participants who did not provide an answer to all four questions were excluded from both the no impact of fire group and the any impact of fire group.
2) Present during the fire vs. not present: The present and not present during the fire groups were defined as participants answering "yes" and "no," respectively, to the question "Were you in or near Fort McMurray during any part of the 2016 wildfire?" Participants who did not answer that question were excluded from both groups.
3) Personally witnessed the fire vs. did not see it: The personally witnessed the fire vs. did not personally witness the fire were defined as participants answering "yes" and "no," respectively, to the question "Did you see the fire in person?" Participants who did not answer that question were excluded from both groups.
4) Home destroyed by the fire vs. home not destroyed: The home destroyed vs. not destroyed by the fire groups were defined as participants answering "yes" and "no," respectively, to the question "Was your home destroyed by the fire?" Participants who did not answer that question were excluded from both groups.
5) High resilience vs. low resilience: Resilience was measured with the CYRM-12 questionnaire. High and low resilience groups were defined as participants whose CYRM-12 scores were, respectively, equal/above the median or below the median CYRM-12 score.

For each of these five pairs of groups, we compared the following 15 measures: 1) mean CPSS score, 2) mean PHQ-A score, 3) mean HADS score, 4) mean CRAFFT score, 5) mean Rosenberg score, 6) mean Kidscreen score, 7) mean CYRM-12 score, 8) percent probable PTSD, 9) percent probable depression, 10) percent probable moderately severe depression, 11) percent suicidal thinking, 12) percent probable anxiety, 13) percent probable alcohol/substance use disorder, 14) percent tobacco use, and 15) percent any of four probable diagnoses. Details of groups are given above. Details of questionnaire scores and probable diagnoses are given above. (Note that we did not compare mean CYRM-12 resilience scores for high vs. low resilience participants, as this would have been tautological.) In analyzing data for a given measure (e.g., mean CPSS), we included only those participants who provided answers for all questions in the relevant questionnaire or scale.

Permutation testing was used for all statistical comparisons (#iterations = 10^5). Permutation testing is a nonparametric method, chosen for its robustness against non-normality. All tests were two-sided, two-sample tests, with a null hypothesis of no difference between the means of the two groups for the given comparison. In total, our analysis included 74 individual statistical tests. We addressed multiple comparisons using the Benjamini–Hochberg method for false discovery rate (FDR) correction. This method computed a threshold of $p = 0.027$ for FDR correction. Effect sizes reported in tables are Cohen's d (mean difference divided by pooled standard deviation). We performed all analyses using in-house computer code in the Clojure programming language (http://clojure.org). The server for the questionnaire website was written in Clojure, and the server saved participants' (anonymous, encrypted) questionnaire answers in Clojure data structures. It was therefore simplest to analyze the data in Clojure as well. In-house analysis code included data collating, sorting, filtering, and questionnaire scoring functions as well as the permutation testing and Benjamini–Hochberg FDR algorithms, which are straightforward to implement. The code for statistical testing and FDR correction is available at http://github.com/mbrown/mrgbstats.

There were small, not statistically significant differences in the distributions of gender identification in the pairs of groups (see **Supplementary Table 1** in the **Supplementary Material**). To test whether the differences in gender identification, though not significant, may have influenced the statistical comparisons of interest, we re-ran all of the comparisons on subsets of the data that were subsampled so as to make the distributions of

gender identification as similar as possible between the groups. The gender-based subsampling did not qualitatively change the significant results; statistical comparisons that were significant in the original dataset were also significant in the subsampled dataset. In addition, there were small but, in some cases, statistically significant differences in mean age in the pairs of groups (see **Supplementary Table 1** in the **Supplementary Material** for full details). To test for confounding effects of age, we re-ran all of the statistical comparisons on subsets of the data that were subsampled to make the distributions of ages as similar as possible between the groups (including no significant difference in mean age). The age-based subsampling did not qualitatively alter the significant results.

RESULTS

The survey was administered to the entire available population of Grades 7–12 students in Fort McMurray, Alberta, Canada who were attending either the public schools (48% of students) or Catholic schools (52% of students) and who were attending their schools on the day the survey was conducted. Five public schools and two Catholics schools took part in the survey. In total, 3,252 students participated out of 4,407 students enrolled in both the public and Catholic systems in Grades 7–12. That is, a total of 72% of enrolled students participated in the survey. The results presented below are organized by comparison groups. For convenience, **Supplementary Table 2** shows the results organized by mental health condition.

Data Exclusion

Of the 3,252 students who participated in the survey, data from 182 students were excluded due to one or more of the following exclusion criteria:

1. Age less than or equal to 10 years.
2. Age greater than or equal to 20 years.
3. Inconsistent answers among the positive and negative questions from the Rosenberg questionnaire (see details in **Supplementary Material**).
4. Inconsistent answers among the positive questions from the Rosenberg questionnaire and the positive questions from the Kidscreen questionnaire (see details in **Supplementary Material**).
5. Inconsistent answers among the nonreversed and reversed questions from the HADS questionnaire. (Answer order for two of the HADS questions is reversed to test for consistency; see details in **Supplementary Material**.)

Criteria 3 to 5 above excluded participants who gave inconsistent answers, possibly because they were not paying attention to the survey or did not understand the questions. After exclusions, the dataset included 3,070 participants, and statistical analysis was done on this set of participant data.

Demographics

Demographics for the 3,070 participants were as follows. Gender identification was 48% female, 48% male, 2% other, and 2% preferred not to say. Age ranged from 11 to 19; mean age was 14.32 with standard deviation 1.82.

Overall Scores and Rates of Probable Diagnoses

Table 2 shows mean questionnaire scores as well as rates for each probable diagnosis category across the entire set of 3,070 participants. For each questionnaire or probable diagnosis, only those participants who filled in every question of the relevant questionnaire were included (see N column in **Table 2**).

Overall, the survey findings reveal the following: PTSD scores were available from 2,877 students, and 37% met criteria for probable PTSD (CPSS score ≥ 15). There were 2,970 students for whom depression scores were available, and of these, 31% met criteria for probable depression (PHQ-A score ≥ 11), and 17% met criteria for probable depression of at least moderate severity (PHQ-A score ≥ 15). Of these 2,970 students, 16% exhibited suicidal thinking. Anxiety scores were available for 2,990 students, of whom 27% met criteria for probable anxiety (HADS score ≥ 11). Alcohol/substance use scores were available from 3,001 students, of whom 15% met criteria for probable alcohol/substance use (CRAFFT score ≥ 2). Tobacco use data were available from 3,011 students, and 13% exhibited tobacco use. Of the 3,070 students, 46% satisfied the "any of 4 probable diagnoses" criterion. (That is, all 3,070 students filled out at least one of the diagnostic questionnaires, and 46% met criteria for one or more probable diagnosis of PTSD, depression, anxiety, or alcohol/substance use).

No Impact of Fire Vs. Any Impact of Fire

There were no statistically significant differences between the "no impact of fire" group and the "any impact of fire" group in 14 of the 15 measures compared (**Table 3**). CYRM-12 resilience scores were slightly higher for the "any impact of fire" group ($p = 0.0041$, see **Table 3**). Suicidal thinking was higher for the "any impact of fire" group ($p = 0.036$), but this result did not survive FDR correction for multiple comparisons. Each comparison used only those students who filled out all questions in the relevant questionnaire. Numbers of students ranged from 258 to 275 for the "no impact of fire" category and 2,610 to 2,705 for the "any impact of fire" category.

TABLE 2 | Overall Questionnaire Scores and Rates of Probable Diagnoses.

Measure	N	Score
CPSS score (PTSD)	2877	12.8 +/- 11.5
PHQ-A score (depression)	2970	8.0 +/- 6.5
HADS score (anxiety)	2990	7.7 +/- 4.7
CRAFFT score (alcohol/drugs)	3001	0.55 +/- 1.25
Rosenberg score (self-esteem)	2974	18.2 +/- 6.6
Kidscreen score (quality of life)	2984	27.0 +/- 8.2
CYRM-12 score (resilience)	2937	46.5 +/- 9.2
Measure	**N**	**Rate**
Probable PTSD	2877	37%
Probable depression	2970	31%
Probable moderately severe depression	2970	17%
Suicidal thinking	2998	16%
Probable anxiety	2990	27%
Probable alcohol/substance use disorder	3001	15%
Tobacco use	3011	13%
Any of 4 probable diagnoses	3070	46%

N = number subjects who filled in all questions in relevant questionnaire.
Scores are means +/- standard deviation (not standard error).

TABLE 3 | No impact of fire vs. any impact.

Measure	No impact of fire	Any impact of fire		
	Score	Score	P-value	Effect size
CPSS score (PTSD)	13.4 +/- 11.6	12.8 +/- 11.5	0.39	0.06
PHQ-A score (depression)	8.0 +/- 6.1	8.0 +/- 6.5	0.89	-0.01
HADS score (anxiety)	7.7 +/- 4.7	7.7 +/- 4.7	0.95	0.00
CRAFFT score (alcohol/drugs)	0.56 +/- 1.32	0.55 +/- 1.24	0.92	0.01
Rosenberg score (self-esteem)	17.8 +/- 6.0	18.3 +/- 6.6	0.31	-0.06
Kidscreen score (quality of life)	26.4 +/- 7.6	27.0 +/- 8.3	0.23	-0.08
CYRM-12 score (resilience)	44.9 +/- 9.7	46.6 +/- 9.1	0.0042*	-0.19
Measure	**Rate**	**Rate**	**P-value**	
Probable PTSD	39%	37%	0.50	
Probable depression	32%	31%	0.58	
Probable moderately severe depression	15%	17%	0.35	
Suicidal thinking	11%	16%	0.036	
Probable anxiety	26%	27%	0.72	
Probable alcohol/substance use disorder	14%	15%	0.79	
Tobacco use	13%	12%	0.77	
Any of 4 probable diagnoses	49%	47%	0.44	

**p-value survives FDR multiple comparison correction (threshold 0.027).*
Scores are means +/- standard deviation (not standard error).

Present During the Fire Vs. Not Present

There were no statistically significant differences between the "present in Fort McMurray during the fire" group vs. the "not present" group in 13 of the 15 measures compared (**Table 4**). CYRM-12 resilience scores were slightly higher for the "present during the fire" group (p = 0.0025, see **Table 4**). Rates of suicidal thinking were higher for the "present during the fire" group (p = 0.026). Each comparison used only those students who filled out all questions in the relevant questionnaire. Numbers of students ranged from 2,570 to 2,663 for the "present in Fort McMurray during the fire" category and 305 to 334 for the "any impact of fire" category.

Personally Witnessed the Fire vs. Did Not See It

Comparison of participants who personally witnessed the fire vs. those who did not see the fire revealed significant differences in 13 of the 15 measures tested (see **Table 5**). Participants who personally saw the fire exhibited higher mean scores for all mental health conditions tested, higher rates for all probable diagnoses tested,

TABLE 4 | Present vs. not present in Fort McMurray during fire.

Measure	Present during fire	Not present		
	Score	Score	P-value	Effect size
CPSS score (PTSD)	12.8 +/- 11.5	13.0 +/- 11.4	0.79	-0.02
PHQ-A score (depression)	8.1 +/- 6.5	7.8 +/- 6.1	0.51	0.04
HADS score (anxiety)	7.7 +/- 4.7	7.7 +/- 4.6	0.93	0.01
CRAFFT score (alcohol/drugs)	0.55 +/- 1.24	0.52 +/- 1.29	0.62	0.03
Rosenberg score (self-esteem)	18.2 +/- 6.6	18.1 +/- 5.9	0.74	0.02
Kidscreen score (quality of life)	27.0 +/- 8.3	26.5 +/- 7.7	0.27	0.06
CYRM-12 score (resilience)	46.7 +/- 9.1	45.0 +/- 9.7	0.0025*	0.18
Measure	**Rate**	**Rate**	**P-value**	
Probable PTSD	37%	37%	0.95	
Probable depression	31%	30%	0.90	
Probable moderately severe depression	17%	14%	0.21	
Suicidal thinking	16%	11%	0.026*	
Probable anxiety	27%	25%	0.47	
Probable alcohol/substance use disorder	15%	13%	0.32	
Tobacco use	13%	12%	0.79	
Any of 4 probable diagnoses	47%	47%	0.91	

**p-value survives FDR multiple comparison correction (threshold 0.027).*
Scores are means +/- standard deviation (not standard error).

TABLE 5 | Personally witnessed fire vs. did not see fire.

Measure	Witnessed fire	Did not see fire		
	Score	Score	P-value	Effect size
CPSS Score (PTSD)	13.2 +/- 11.6	11.6 +/- 11.0	0.0021*	0.14
PHQ-A Score (depression)	8.2 +/- 6.6	7.2 +/- 6.0	0.00046*	0.16
HADS Score (anxiety)	7.9 +/- 4.8	7.2 +/- 4.5	0.0023*	0.14
CRAFFT Score (alcohol/drugs)	0.60 +/- 1.29	0.35 +/- 1.06	0.00001*	0.20
Rosenberg Score (self-esteem)	18.1 +/- 6.7	18.6 +/- 6.1	0.076	-0.08
Kidscreen Score (quality of life)	26.8 +/- 8.3	27.7 +/- 7.8	0.019*	-0.11
CYRM-12 Score (resilience)	46.6 +/- 9.1	46.0 +/- 9.5	0.19	0.06
Measure	**Rate**	**Rate**	**P-value**	
Probable PTSD	38%	32%	0.0042*	
Probable depression	32%	26%	0.0075*	
Probable moderately severe depression	18%	13%	0.0032*	
Suicidal thinking	17%	12%	0.0011*	
Probable anxiety	28%	22%	0.0018*	
Probable alcohol/substance use disorder	16%	9%	0.00001*	
Tobacco use	14%	7%	0.00001*	
Any of 4 probable diagnoses	49%	41%	0.00022*	

**p-value survives FDR multiple comparison correction (threshold 0.027).*
Scores are means +/- standard deviation (not standard error).

and lower means scores for quality of life. Rosenberg self-esteem and CYRM-12 resilience scores were not significantly different between these two groups. Each comparison used only those students who filled out all questions in the relevant questionnaire. Numbers of students ranged from 2,270 to 2,350 for the "personally witnessed fire" category and 604 to 641 for the "did not see the fire" category.

Home Destroyed by the Fire Vs. Home Not Destroyed

Participants whose homes were destroyed vs. not destroyed by the fire exhibited significant differences in 12 of the 15 measures tested (see **Table 6**). Those whose home was destroyed had higher mean scores for all mental health conditions tested, higher rates for all probable diagnoses tested (except suicidal thinking), and lower means scores for self-esteem, quality of life, and resilience. Rates of probable depression and tobacco use were higher for the home destroyed group ($p = 0.039$ and $p = 0.033$, respectively), but these results did not survive FDR correction for multiple comparisons. Each comparison used only those students who filled out all questions in the relevant questionnaire. Numbers of students ranged from 284 to 299 for the "home destroyed" category and 2,590 to 2,691 for the "home not destroyed" category.

TABLE 6 | Home destroyed vs. not destroyed by fire.

Measure	Home destroyed	Home not destroyed		
	Score	Score	P-value	Effect size
CPSS Score (PTSD)	15.9 +/- 12.5	12.5 +/- 11.3	0.00001*	0.30
PHQ-A Score (depression)	9.1 +/- 6.8	7.9 +/- 6.4	0.0018*	0.19
HADS Score (anxiety)	8.6 +/- 5.1	7.7 +/- 4.7	0.00083*	0.20
CRAFFT Score (alcohol/drugs)	0.78 +/- 1.44	0.52 +/- 1.22	0.0011*	0.20
Rosenberg Score (self-esteem)	17.2 +/- 6.8	18.3 +/- 6.5	0.0049*	-0.17
Kidscreen Score (quality of life)	25.4 +/- 8.7	27.2 +/- 8.1	0.00058*	-0.21
CYRM-12 Score (resilience)	44.8 +/- 10.0	46.7 +/- 9.1	0.0013*	-0.20
Measure	**Rate**	**Rate**	**P-value**	
Probable PTSD	46%	36%	0.00033*	
Probable depression	36%	30%	0.039	
Probable moderately severe depression	22%	16%	0.027*	
Suicidal thinking	19%	15%	0.11	
Probable anxiety	35%	26%	0.0023*	
Probable alcohol/substance use disorder	22%	14%	0.00019*	
Tobacco use	16%	12%	0.033	
Any of 4 probable diagnoses	58%	46%	0.00008*	

**p-value survives FDR multiple comparison correction (threshold 0.027).*
Scores are means +/- standard deviation (not standard error).

High Resilience Vs. Low Resilience

The median resilience score (CYRM-12 score) across the 3,070 participants included in the statistical analysis was 48. High resilience was defined as having a CYRM-12 score of 48 or more, while low resilience was defined as having a CYRM-12 score of less than 48. There were significant differences between participants with high vs. low resilience scores on all 15 measures tested (see **Table 7**). Participants with high resilience showed lower scores on all mental health conditions, lower rates for all probable diagnoses, and higher self-esteem and quality of life scores. Each comparison used only those students who filled out all questions in the relevant questionnaire. Numbers of students ranged from 1,480 to 1,513 for the high resilience category and 1,376 to 1,424 for the low resilience category.

DISCUSSION

Mental Health

This study examined the impact of the wildfire on the mental health of youth in Fort McMurray, Alberta. The findings indicate rates of probable PTSD (37%), probable depression (31%), probable anxiety (27%), and probable alcohol/substance use disorder (15%) in the population of Grades 7–12 students in Fort McMurray, Alberta 18 months after the 2016 wildfire. By way of comparison with previous Canadian studies, the prevalence of probable diagnosis of PTSD in children has been reported as 15.5% (35); prevalence of major depression in adolescents has been reported as 4–8% (37); incidence of probable anxiety in children and adolescents has been reported as 10–13% (38); and 17% of adolescents have reported binge drinking in the past month (39). In addition, comparison of the Fort McMurray survey data with control (nondisaster) data from Red Deer, Alberta (22) found that symptoms of depression and anxiety were higher in the Fort McMurray data as were rates of probable depression [see Figure 2 in Ref. (22)]. Rates of probable anxiety and probable alcohol/substance use disorder were not significantly different (22). Self-esteem and quality of life scores were lower in Fort McMurray (22). [The earlier study (22) did not compare PTSD symptoms between Fort McMurray and Red Deer, as the Red Deer mental health survey did not include a PTSD measure.] These findings therefore suggest significant elevated rates of PTSD, probable depression, and anxiety in Fort McMurray students following the wildfire. Overall, the results presented in the current study are consistent with previous studies showing increased mental health symptoms subsequent to wildfires (4–8, 11, 13, 40). These results highlight the need for mental health programs and supports for youth following disaster. (Consistent with this, Fort McMurray Public and Catholic Schools have put significant and ongoing work into establishing and maintaining mental health support programs for their students in the period following the wildfire. For details, see Appendix—Mental Health Support Programs in the **Supplementary Materials**).

Specific Impacts of the Wildfire

It was anticipated that those students who had the greatest level of impact from the 2016 wildfire, in the form of personally seeing the fire (vs. not seeing it) or having their homes destroyed (vs. not destroyed), would have more frequent mental health symptomatology. The findings indicate that students directly impacted by the fire had significantly higher scores on scales measuring symptoms related to PTSD, depression, anxiety, and substance misuse. These students also had significantly lower scores for self-esteem, quality of life, and resilience. The findings indicate that students directly impacted by the fire had higher rates of probable PTSD, depression, anxiety, and substance use disorder and higher rates of suicidal thinking and tobacco use. These results suggest that mental health impacts are more severe with increased

TABLE 7 | High vs. low resilience.

Measure	High resilience	Low resilience		
	Score	Score	P-value	Effect size
CPSS Score (PTSD)	7.9 +/- 8.1	18.1 +/- 12.2	0.00001*	-0.99
PHQ-A Score (depression)	5.2 +/- 4.6	11.0 +/- 6.8	0.00001*	-1.00
HADS Score (anxiety)	6.1 +/- 4.0	9.5 +/- 4.8	0.00001*	-0.79
CRAFFT Score (alcohol/drugs)	0.30 +/- 0.89	0.81 +/- 1.50	0.00001*	-0.42
Rosenberg Score (self-esteem)	21.6 +/- 5.2	14.6 +/- 6.0	0.00001*	1.24
Kidscreen Score (quality of life)	31.3 +/- 6.5	22.4 +/- 7.3	0.00001*	1.30
Measure	**Rate**	**Rate**	**P-value**	
Probable PTSD	18%	56%	0.00001*	
Probable depression	14%	49%	0.00001*	
Probable moderately severe depression	5%	30%	0.00001*	
Suicidal thinking	5%	27%	0.00001*	
Probable anxiety	14%	41%	0.00001*	
Probable alcohol/substance use disorder	8%	22%	0.00001*	
Tobacco use	8%	17%	0.00001*	
Any of 4 probable diagnoses	29%	67%	0.00001*	

**p-value survives FDR multiple comparison correction (threshold 0.027).*
Scores are means +/- standard deviation (not standard error).

severity of impact from wildfire on the individual, in the form of personally seeing the fire or having one's home destroyed.

Importantly, the findings also revealed an unexpected pattern in students who had no direct impact from the fire; that is, they were out of town during the fire for a variety of reasons or were not living in Fort McMurray during the fire. The scores on almost all scales and questionnaires for these students were very similar to those who had direct experience with any impact of the fire (present during the fire, saw the fire, and/or home destroyed) in terms of mental health symptom scores, self-esteem, quality of life scores, and rates of probable diagnoses. These findings suggest that youth not directly impacted by the fire nonetheless experienced vicarious trauma as a result of the fire's large impact on the community, similar to secondary trauma experienced by first responders and researchers in post-disaster situations (41, 42). These results are consistent with the literature, which indicates a substantial deleterious impact of wildfire disasters on population mental health (4–6, 8–11, 40). These results emphasize the need for policies and programs to support mental health in youth who are directly or indirectly impacted by disaster, as well as the need for a community-wide approach.

Resilience

Finally, resilience also played an important role in the mental health of youth. Low resilience was linked with substantially more severe mental health impacts from the wildfire. Though we do not have survey data from Fort McMurray prior to the 2016 wildfire, we believe that having a higher baseline level of individual resilience prior to a disaster would have beneficial effects on youth's mental health. This is supported by previous research showing that higher resilience is associated with better mental health outcomes following disaster (9, 13, 20, 21). These results emphasize the need for long-term mental health supports for youth post-disaster, with specific efforts focusing on increasing youth's resilience, which may serve as a protective factor that mitigates the effects of disaster on mental health.

Implications

In terms of interventions, there is often active discussion about whether to intervene in complete populations (so-called Universal interventions), even when only a subset of the population has issues, or whether is it better to be more focused (so-called Targeted or Selective interventions) for those with the greatest need. The issue with the latter approach, however, is that it misses large numbers of individuals who have only mild or moderate symptoms. The approach we have previously advocated is a combined approach, and we have shown this to be successful (43, 44). Nonetheless, we are not aware that this comprehensive approach has been examined after a wildfire or other major event, so its efficacy in this situation remains uncertain.

Limitations

The results presented here are based on a large sample of 3,070 participants. One limitation of the study is that clinical measures were based on self-report questionnaires as opposed to clinical interviews. Conducting a full clinical interview with each participant would not have been feasible given the large sample size. It would have been useful to have data using the same questionnaire battery from the Fort McMurray student population from before the 2016 Wildfire. This would have allowed a before and after wildfire comparison with identical instruments. Instead, we have previously presented a comparison of the Fort McMurray mental health data with control data previously collected using a very similar battery in Red Deer, Alberta (22).

CONCLUSION

In conclusion, the present results support existing findings that both youth and communities impacted by a wildfire, or similar major disaster, experience long-term mental health impacts. The present data extend this by examining all youth in grades 7–12 attending schools in Fort McMurray following the 2016 wildfire and identifying those groups who are most vulnerable and have the greatest risk. It is likely that providing additional assistance for all individuals to increase resilience, and also focusing on those with particularly severe wildfire impact, would be useful in terms of improving population mental health after a wildfire and other major disasters. Fort McMurray Public and Catholic Schools have put significant and ongoing work into establishing and maintaining mental health support programs for students in the aftermath of the 2016 wildfire. The findings presented here are consistent with the need for long-term mental health supports in disaster-affected communities such as Fort McMurray.

DATA AVAILABILITY

The dataset analyzed in this study is available from the corresponding author on reasonable request.

ETHICS STATEMENT

In November 2017, 18 months after the 2016 wildfire, the two school boards in Fort McMurray—Fort McMurray Public Schools and Fort McMurray Catholic Schools—asked all students in Grade 7–Grade 12 to complete a comprehensive survey of their mental health. The survey was conducted to enable the school boards to evaluate the effectiveness of the programs they had put in place immediately following the wildfire. Researchers from the University of Alberta were asked to collaborate and provide assistance in designing the survey and analyzing the survey data. After the data were collected, the anonymized data were made available for analysis by the researchers from the University of Alberta. The analysis of the survey data was approved by the University of Alberta's Health Research Ethics Board on June 26th, 2017 (ethics protocol number Pro00072669).

The survey included questions to determine demographics, mental health, resilience, personal exposure to, and direct impacts of the wildfire. All survey data were collected under the auspices and ethical guidelines of the two Fort McMurray school systems and were administered as part of their standard curriculum and as an ongoing assessment of the educational and support programs they had put in place after the wildfire.

The selection of measurement instruments was determined by the school systems and was informed by the existing scholarly literature and findings. Parents and guardians were notified of the process by written letter 2 weeks prior to the administration of the survey in the schools, and they had the option to opt their child(ren) out of the survey. Students had the option to participate or not in the survey, and this was explained at the start of each survey data collection session. Survey participation was anonymous; participants were not asked for their names. This paper provides an analysis of the survey data that were collected from both school boards.

AUTHOR'S NOTE

Some portions of the manuscript, mostly in the Materials and Methods section, are shared with a separate manuscript by the authors (22) presenting a distinct set of findings based on a separate analysis comparing the data from Fort McMurray to a similar survey dataset collected previously in Red Deer, Alberta.

AUTHOR CONTRIBUTIONS

MB, VA, AG, PB-M, JD, CM-H, JO, MM, SN, DK, and PS were in charge of study design. MM, SN, and DK were in charge of data collection. Analysis was done by MB, IC, and PS. Manuscript preparation was done by MB, IC, PB-M, JD, CM-H, and PS.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2019.00623/full#supplementary-material

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Methodology of "14–7" Program: A Longitudinal Follow-Up Study of the Pediatric Population and Their Families Exposed to the Terrorist Attack of Nice on July 14th, 2016

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Introduction: After a traumatic event, children and adolescents may present several clinical consequences, the most common being Post-Traumatic Stress Disorder (PTSD). Most children and adolescents with PTSD have comorbid disorders, such Attention Deficit Hyperactivity Disorder, depression, attachment and anxiety disorders, sleep disturbances and behavior problems. However, epidemiological studies on the development of PTSD and other psychiatric disorders in children and adolescents as a consequence of a terrorist attack and mass murder are lacking. Long-term follow-up of exposed children and adolescents will help identify risk and protective factors of developing psychiatric and psychological conditions after exposure to traumatic events or situations. The main objective of this article is to present the methodology of "14–7" program. The aim of "14–7" program is to characterize the risk and protective psychosocial factors affecting the clinical evolution of a pediatric population sample, exposed to the terrorist attack of July 14th, 2016 in Nice.

Method and Analysis: "14–7" program is a multicentre longitudinal cohort study. Major inclusion criteria are children and adolescents exposed to the terrorist attack and aged under 18 years on July 14th, 2016. These children and adolescents will be compared to a non-exposed to the "14–7" terrorist attack group, matched on age and gender. Participants will be assessed at baseline (T1), 2 years (T2) and 5 years (T3) after the initial assessment (T1), and every 5 years until they are 25 years old. Multiple domains are assessed: 1) mental health disorders, 2) intensity of PTSD symptoms, 3) intensity of comorbid symptoms, 4) quality of the parent–child relationship, 5) intelligence quotient, 6) parental symptoms. We will also establish a biological collection of saliva samples, magnetic resonance imaging (MRI) and actigraphy data collection. Main analyses comprise analyses of variance and regression analyses of predictors of clinical evolution over time.

Ethics and Dissemination: The National Ethics Committee "NORD OUEST III" approved the "14–7" Program protocol (number 2017-A02212-51). All patients and their caregivers signed informed consent on enrolment in the "14–7" Program. Inclusions started on November 21st, 2017. Three hundred thirty-five individuals have been included (191 children and adolescents, 144 parents).

Clinical Trial Registration: www.ClinicalTrials.gov, identifier NCT03356028

Keywords: post-traumatic stress disorder, children, longitudinal studies, cohort, psychiatry

BACKGROUND

On 14 July 2016 in Nice, celebration day in France, a terrorist attack happened. Many children and their families were impacted physically and psychologically. At least 30,000 people were present on the Promenade des Anglais (the attack site). This is the most important terrorist attack against families and children in France.

Eighty-six people died in the attack, including 10 children, the youngest being 4 years old. At least 55 children and adolescents were bereaved because of this crime. From 14th 2016 to the beginning of the "14–7" Program (November 21st, 2017), 827 outpatients children, aged less than 18 years old, have consulted the child and adolescent psychiatry service as results of clinical consequences of this attack (1).

After being exposed to a traumatic event, children and adolescents may suffer from several clinical conditions (2). Among them, the most common is post-traumatic stress disorder (PTSD) (2). PTSD includes four main clinical symptoms: flashbacks of the event, avoidance behaviors, alteration of cognition and mood, and neurovegetative overactivation (3). Moreover, children and adolescents have specific clinical symptoms, such as general fears, developmental regression or traumatic re-enactment through play (4).

PTSD contributes to the development of many other mental disorders (5, 6). Around 75% of children and adolescents with PTSD have comorbid disorders. The main comorbidities identified in the pediatric populations are anxiety disorders, attention-deficit-hyperactivity disorder and depression (7, 8, 9). In addition, children and adolescents might present reactive attachment disorder, sleep disturbances and behavior problems (such as oppositional defiant disorder) (8).

Rates of PTSD in children and adolescents exposed to a potentially traumatic event have been shown to vary between 6% and 20% depending on several factors (10). That is, trauma history and exposure, sociodemographic, psychiatric, psychologic, environmental, and biological factors may modulate the development of PTSD.

Concerning trauma history and exposition, it has been reported that individuals who experience multiple trauma are at higher risk of developing chronic PTSD (11). In addition, the degree of violence, the individual experiences during the exposition, is known to influence the development of PTSD (12). However, whether the exposure is direct or indirect does not seem to have an impact on PTSD development, but it may have an effect on its chronicity (13). Repeated trauma cause more PTSD in children and adolescents than single events [35% (14) vs. 18% (15)]. The prevalence of PTSD after a human attack (more than 50% (16, 17) might be much higher than after other traumas [23% to 30%, after a natural disaster (18, 19), 17% after road accidents (15, 20)]. A higher prevalence of PTSD after a mass attack compared to other types of trauma is also described in adults [39% vs 10% (21, 22)].

Among sociodemographic factors, age, sex, socio-economic status (15) and psychosocial resources (23) have been associated with different varying risks of PTSD. Some studies assumed that being a woman or a girl has been found associated with higher risk of PTSD development after a traumatic event (24). Younger children might have a higher prevalence of PTSD compared to older ones [39% for under 6 years versus 33% for 6–11 or 27% 12 years and older (9)]. People with lower socioeconomic status (15) and with depleted psychosocial resources (23) seem at greater risk of PTSD development. Consistent effects were found for these variables in PTSD severity (9.2% more) and PTSD onset (8.75% more), while the results are less obvious concerning racial/ethnic differences in PTSD persistence (5.40% more).

Among psychiatric factors, having anterior mental disorders, and in particular depression, anxious disorders, or PTSD (25) is associated with higher intensity of acute stress reaction and higher risk of peri-traumatic dissociation (26). Moreover, the risk of PTSD chronicization is increased when the child develops PTSD comorbidities (27).

Concerning psychological factors that have been found related to PTSD, the feeling of fear, during trauma and in the first month after the exposition to the traumatic event, is a risk factor implicated in the PTSD development (28). In a similar way, guilt and shame after the event predict the development of this disorder (29). Finally, cognitive alterations, that is, alterations of working memory and executive functioning and attentional biases are correlated with the occurrence and the risk of transition to PTSD chronic state symptoms (30).

Among environmental factors, family reactions during and after the trauma modulate the risk of PTSD development (31). Parental distress as well as parental PTSD and other parental mental disorders conduct to a higher risk of PTSD in children and adolescents (32, 33). On the contrary, quality of familial and social support, available psychological health care, recognition of traumatic impact by the society (31) have been identified as protective factors of PTSD development.

Finally, researches on adults have shown three biological markers of PTSD development: low cortisol 24 h after trauma (34), reduction of the volume of the hippocampus (35) and prefrontal dysfunction (36). Studies underlined that individuals with decreased hippocampus volume and prefrontal dysfunction following exposure displayed more PTSD-related symptoms 1 month after. In contrast, initial smaller hippocampus volume pre-exposure did not have an effect on PTSD-related symptoms (35).

Although several risk factors of PTSD in both children and adults have been documented, most research on risk factors of PTSD development in children and adolescents has focused on a small number of factors. Therefore, there is to date no integrative model of the PTSD development, and of risk of chronicity or relapse. Research on adult PTSD attempts to demonstrate the existence of different PTSD patterns consistent with symptoms, trauma and comorbidity (37) and to understand the temporal courses of PTSD (38). These results have not yet been replicated in children and adolescents.

Because both children and parents were exposed to the event and because of the nature of traumatic event, the prevalence of PTSD in the pediatric population implicated in the Nice attack may be very important.

The primary objective of the "14–7" Program is to characterize the risk and/or protective psychosocial factors affecting the clinical evolution of a pediatric population sample exposed to the terrorist attack of July 14th, 2016 in Nice.

Secondary objectives of the "14–7" Program are to examine efficacy of clinical treatments as a function of the developmental age of the child, and to develop recommendations for treatments and therapies.

METHODS/DESIGN

Ethical Consideration, Funding, and Registration

The "14–7" Program protocol was approved by the National Ethics Committee "NORD OUEST III" (number 2017-A02212-51).

All patients and their legal caregivers signed informed written consent upon enrolment in the study. The "14–7" Program has also been registered with ClinicalTrials.gov (number NCT03356028). Inclusions started on November 21st, 2017.

Objectives

The main objective of "14–7" Program is to characterize the risk and/or protective psychosocial factors affecting the clinical evolution of a pediatric population sample, after the "14–7" terrorist attack.

Secondary objectives are: 1) assessment of the prevalence and incidence of mental health disorders, 2) assessment of the intensity of PTSD symptoms, 3) assessment of the intensity of comorbid symptoms, 4) assessment of the quality of the parent–child relationship, 5) assessment of the intelligence quotient, 6) assessment of parental symptoms 7) establishment of a biological collection of saliva samples, and 8) establishment of a magnetic resonance imaging (MRI) and actigraphy data collection.

Study Design

"14–7" is a longitudinal research involving human beings (i.e., French Law: category 2), with minimal risk and constraints, not involving health products. This search is a longitudinal follow-up study until participants reach the age of 25 years old. Participants will be assessed at baseline (T1), 2 years (T2), and 5 years (T3) after the initial assessment (T1), and every 5 years until they are 25 years old (**Figure 1**). During T1, T2, and T3 salivary samples will be taken from the included children and their parents, for all participants. At T1 and T2, actigraphy and MRI will be proposed for all participants.

Each measurement occasion includes four visits. Measures administered at visits 1, 2, 3, and 4 are summarized in **Table 1**. Assessment will be performed by investigators [child and adolescent psychiatrists, (neuro)psychologists] specifically trained in psychotrauma and child psychiatry.

PARTICIPANTS

Two groups were defined:

- Group 1: children exposed to the "14–7" terrorist attack;
- Group 2: children non-exposed to the "14–7" terrorist attack.

Patient selection and recruitment:

Exposed children are recruited by consultation registry of the Nice CHU Lenval, ORSAN database (a national list of victims from terrorist attack). Controls will be matched

TABLE 1 | "14-7" Program procedure and evaluation criteria for the first study times.

		Selection	V1*	V2*	V3*
Inclusion criteria		X			
Informed consent		X			
Psychosocial risks			X		
CGI/ CGA (39, 4)			X		
Salivary specimen			X		
DIPA (40)	**Psychiatric**		X		
MiniKid (41)	**evaluation**				
K-SADS-PL (42)					
YCPC (43)				X	
CPC (44)	**PTSD scale**				
PCL (45)					
CDRS (46)	**Depression**			X	
HDRS (47)	**scale**				
PAS (48)				X	
STAIC (49)	**Anxiety scale**				
STAI (49)					
BITSEA (50)				X	
PDEQ (51)				X	
Conners (52)				X	
IPPA (53)				X	
Kidscreen (54)				X	
PSI-SF (55)				X	
PIPS (56)				X	
BECS (57)	**Cognitive and**				X
WPPSI (58)	**emotional**				
WISC (59)	**evaluation**				
WAIS (60)					

V1, Visit 1; V2, Visit 2 and V3, Visit 3.

on age and sex. Moreover, participants will be recruited *via* press advertisements and National Education. For the control group, categorical screening criteria were used to estimate the number of subjects necessary to reach a statistical power of 80% with a risk of type-I error (α) of 5% for the main outcome variable. Assuming a frequency of development of PTSD of 20% in the general population, to demonstrate a 40% increase in incidence (incidence rate found during violent and intentional traumatic events), it is necessary to include 1,122 participants; that is, 561 child controls. We will then include 600 children (150 per centre) matched on age and sex to the group of exposed children.

Inclusion Criteria

Exposed group:

- Children, adolescents, and young adults of the Nice region exposed by the terrorist attack and aged under 18 years on July 14th, 2016, according to DSM 5.
- Children of pregnant women at the time of the Nice attack.
- Affiliated to a social security scheme;
- Fluent in French;
- Informed written consent of legal guardians and child/adolescent.

Non-exposed group:

- Children, adolescents and young adults, matched in age and gender to exposed group;
- Non-exposed to the "14–7" terrorist attack;
- Affiliated to a social security scheme
- Fluent in French;
- Informed written consent of legal guardians and child/adolescent.

Non-Inclusion and Exclusion Criteria

Non-inclusion criteria for the Nice cohort and control group were children, adolescents and/or young adults with average intellectual disability (IQ below 50), persons deprived of freedom after judicial or administrative decision, and persons subject to an exclusion period due to participation in other research.

Concerning the exclusion criteria, a request made by the child/adolescent/young adult or his/her parent for no longer participating to the "14–7" Program.

Measures

Quantitative and qualitative measures are administered to the participants (summarized in **Table 1**):

- Questionnaires regarding psychosocial risks (socio-demographic information; exposure to the traumatic event; care immediately after exposure; current care; social support, media exposure; legal procedure and assistance),
- Semi-structured interviews to assess the main diagnosis in children: MiniKid, Diagnostic Infant and Preschool Assessment (DIPA) or Kiddie—Schedule for Affective Disorders and Schizophrenia (K SADS),
- Salivary specimens for the construction of a biological DNA and RNA database,
- Clinical scales to assess PTSD: Young Child PTSD Checklist (YCPC), Child PTSD Checklist (CPC), or PTSD checklist (PCL),
- Clinical scales to assess anxiety: Preschool Anxiety Scale (PAS), Situational-Trait Anxiety Inventory for children (STAIC), or Situational-Trait Anxiety Inventory (STAI),
- Clinical scales to assess depression: Children's Depression Rating Scale (CDRS) or Hamilton Depression Rating Scale (HDRS),
- Clinical scales to assess ADH/D (Conners),
- Clinical scales to assess dissociative experiences: Peri-traumatic Dissociation Experiences Questionnaire (PDEQ),
- Evaluation of social aspects: Brief Infant-Toddler Social and Emotional Assessment (BITSEA), Inventory of Parenting and Peer Attachment (IPPA), Kidscreen, parental stress index—short form (PSI-SF), or Post-Trauma Inventory of Parental Style (PIPS),
- Cognitive and socio-affective development for the youngest patients (Cognitive and Socio-Emotional Evaluation Battery: BECS) and intelligence quotient: Wechsler Preschool and Primary Scale of Intelligence (WPPSI), Wechsler Intelligence Scale for Children (WISC), or Wechsler Adult Intelligence Scale (WAIS).

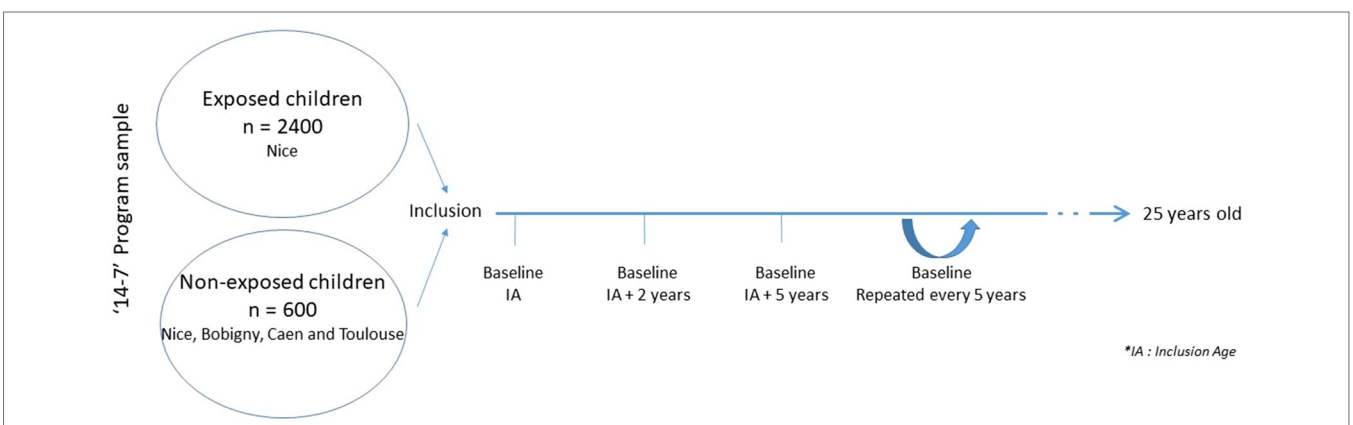

FIGURE 1 | Study design and participants of "14–7" Program.

- Parents' clinical symptoms are also evaluated with the Clinical Global Impression (CGI), Clinical Global Assessment Scale (CGA), PCL, HDRS, STAI, PDEQ, PSI-SF and PIPS.

Clinical scales are all based on DSM-5 classification. They are scientifically validated assessment tools and are often used in clinical settings.

Data Collection Process

Each investigator at the different study centers is responsible for collecting and entering data on the electronic CRF (Case Report Form) at the time of the visit. The Child and Adolescent Psychiatry University Unit (SUPEA) and the Research Center (Epidemiology and Population Health (INSERM U1018)) will perform data analysis of the database.

Statistical Analysis

Statistical analyses will be run with R, SPSS, and AMOS softwares.

Descriptive analyses of all the parameters collected at baseline and during follow-up will be conducted.

Correlations will be carried out to examine associations between trauma history and exposition, sociodemographic, psychiatric, environmental, psychological and biological data.

Analyses of variance will be conducted to test the differences between the exposed group and the control group on trauma history and exposition, sociodemographic, psychiatric, environmental, psychological and biological data.

Multivariate models (linear and non-linear regression models, mediation and moderated mediation models) will be carried out to:

(1) examine associations between clinical conditions (trauma history and exposition, sociodemographic, psychiatric, environmental, psychological, and biological data), at baseline in children and parents,
(2) predict clinical evolution over time with trauma history and exposition, sociodemographic, psychiatric, environmental, psychological and biological variables. Significant predictors from bivariate analysis (at $p < 0.05$) will then be included in a multivariate regression model. Owing to overlap of assessments, multicollinearity of predictors will be tested and addressed in multivariable models.

Each individual hypothesis will be tested at a significance level of 0.05. However, in order to compensate for the likelihood of incorrectly rejecting a null hypothesis when testing multiple hypotheses (i.e., making a Type I error), methods such as the Bonferroni correction will be used to reduce the likelihood of Type I error when testing multiple comparisons.

These statistics will be conducted on data from the whole cohort and from single groups (i.e., group of exposed children and non-exposed group) and on data from all collection waves.

Outcomes

The main objective of "14–7" Program is to characterize the risk and/or protective psychosocial factors affecting the clinical evolution to the age of 25 years old of a pediatric population sample exposed to the mass trauma of 14 July 2016 in Nice.

Knowledge concerning risk and/or protective factors will help practitioners to detect children and adolescents at high risk of mental disorders in order to provide efficient follow-up and therapy.

Secondary objectives of the "14–7" Program are to examine efficacy of clinical treatments as a function of the developmental age of the child, and to develop recommendations for treatments and therapies. Results will therefore help future clinicians make evidence-based decisions on which treatment to use, depending on the developmental age of the child, and then help reduce the costs of trauma consequences.

Finally, in France, "14–7" Program should rapidly provide clinicians with adapted and standardized assessment tools validated in the pediatric population of all ages in the French language (e.g., DIPA, YCPC, CPC).

DISCUSSION

It has been reported that psychiatric disorders such as PTSD have a high prevalence in war-exposed children (61), and more generally in intentional trauma (62). However, research on psychotrauma in terrorism context on pediatric population is rare and/or very fragmented, and there are few reliable data in children and adolescents exposed to traumatic events (63).

Most epidemiological studies have involved either small samples of number of participants or very heterogeneous samples. For example, in some studies, participants have experienced different types of trauma and in other studies, a very small number of factors related to PTSD have been investigated [for a meta-analysis, see Ref. (31)]. In others, very few factors related to PTSD have been investigated such as quality of life [Ref. (31); see also Ref. (18)]. Then, one of the main advantages of the "14–7" Program is that it includes multiple assessments (psychiatric, psychological, psychosocial, biological, and cognitive), on a population of children having experienced the same traumatogenic event. The interest of "14–7" Program is to understand better clinical and cognitive specificities of trauma in pediatric population. Moreover, "14–7" Program integrates a developmental and biological approach.

Children and adolescents are also vulnerable for conduct, attention, and others psychiatric disorders after a PTSD development (8). An acute understanding of the clinical, cognitive, social, and biological consequences of trauma are necessary to orient specific follow up and treatments of the impacted pediatric population.

The main strength of the "14–7" Program is the standardized evaluation and follow-up of a large number of children and adolescents impacted by a terrorist attack in a country in peace, with assessments until the young adult age (25 years).

The American Academy of Child and Adolescent Psychiatry (AACAP) recommends early interventions for children and adolescents to reduce clinical manifestations of trauma (64). AACAP also suggests that relying on the support of the young patient's family, school, and friends is important, and that psychotherapies should allow the child to talk about the traumatic event in a safe space by speaking, drawing,

playing, or writing. Unfortunately, no recommendation on the types of therapies to use and on their duration has been provided so far (64).

Limitations of the Study

The main limitation of the "14–7" program might be the risk of non-representability of the entire pediatric population impacted by the terrorist attack.

First, individuals exposed to this attack and leaving outside the Nice region will be very difficult to be included. Second, children' and/or parents' avoidance behaviour might limit participation to the study. Third, the time lapse between the attack and the start of "14–7" Program does not permit to prospectively analyze clinical manifestations and PTSD during the first year. Nevertheless, questionnaires and diagnostic assessments include retrospective and lifetime evaluations. Finally, participant drop-out occurs in all prospective and longitudinal studies. Attrition not only causes loss of power because of diminishing numbers of participants, but if systematic, this may lead to selection biases and erroneous conclusions being drawn from a study. To prevent attrition, call phoning and newsletters are regularly realized for all participants.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by National Ethics Committee "NORD OUEST III." Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

MG wrote the manuscript. ST, AS, FG, and MB are the proofreaders. FA is the writer and the coordinator.

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Impact of a Terrorist Attack on the Mental Health of Directly Exposed French Adolescents: Study Protocol for the First Step of the AVAL Cohort Study

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Background: Several terrorist attacks have recently taken place in France and Europe. Various studies have shown a high prevalence of Post-Traumatic Stress Disorder (PTSD) and other psychiatric disorders among the victims of these attacks. Nevertheless, research in this field is scarce and no cohort study has been conducted yet to evaluate the impact of a terrorist attack on teenagers directly exposed to this type of events. Therefore, we decided to work on the AVAL (*Adolescents Victimes de l'Attentat de Londres*) cohort study in order to measure the psycho-traumatic impact of this attack and to describe these adolescents' health care pathways.

Material and method: The 53 students of a French high school who were directly exposed (criterion A1 of PTSD in DSM-5) to the terrorist attack perpetrated in London on March 22, 2017 constitute the target population of this monocentric cross-sectional observational study. We decided not to include the three students who were physically wounded and, therefore, didn't have the same sensorial exposition. The primary endpoint will be the prevalence of PTSD 12 to 15 months after the attack, measured by the PCL-5 (Post-traumatic stress disorder Check-List for DSM-5) global severity score: the diagnosis of PTSD will be retained when the score is > 32. We will also use an extensive battery of clinical tests to assess the prevalence of anxiety disorders, mood disorders, sleep disorders, addictions, suicide risk, and alterations in social, family, and school functioning 12 to 15 months after the attack. We will also describe these adolescents' health care pathways since the attack and collect data from the clinical evaluation performed during the initial intervention of the medico-psychological emergency cell within 10 days after the attack.

Discussion: The findings of this study are intended to provide epidemiological data about the psycho-traumatic impact of a terrorist attack on the mental health of directly exposed adolescents and to describe these adolescents' health care pathways, thus contributing to improve the immediate, post-immediate, and delayed response strategies after a major

psycho-traumatic event involving adolescents (and in particular after terrorist attacks), as well as the identification and psychiatric care of the young survivors requiring specialized care.

Clinical Trial Registration: www.ClinicalTrials.gov, identifier NCT03493243.

Ethics and Dissemination: The regional ethics committee (Comité de Protection des Personnes Ouest IV—Nantes) approved the study protocol (Reference 10/18_3). All participants (and their legal guardians, for minors) must sign the informed consent to participate. The protocol was presented at the French congress of psychiatry in Nantes (France) in November 2018. After study completion, the results will be published and detailed in Marion Grenon's MD thesis in psychiatry.

Keywords: PTSD, terrorism, teenagers, post-traumatic stress disorders, adolescent psychiatry, crisis intervention

INTRODUCTION

Since 2012, several terrorist attacks have taken place in France and Europe. On March 22, 2017, one of these attacks, which occurred in one of the most popular tourist areas of London, stroke French high school students among other people. Around 14:40 that day, a car turned into Westminster Bridge in London. The vehicle drove on the sidewalk, running down twenty pedestrians in its path. The assailant ended his run just after Big Ben, crashing his car in the North gate of Westminster Palace, seat of the British Parliament. Armed with a knife, the driver left his vehicle and ran to the main entrance of the Parliament, then stabbed a guard and entered the courtyard of the Palace before being shot by two officers. Six people died in this attack, including the perpetrator. Fifty people were injured, including three French high school students who were on a school trip.

Apart from the three physically injured teenagers, all the students were repatriated to France the day after the attack, after being heard by the British police. Upon arrival, the medico-psychological emergency cell was deployed to allow them, their families, and anyone who felt the need to do so to meet a mental health professional (nurse, psychologist, or psychiatrist). This post-immediate evaluation involved almost all the high school students who constitute our target population and allowed us, as we will explain later, to retrospectively get a basis for our research work through their medical files.

Based on this post-immediate evaluation, the adolescents who needed it were referred to specialized care, mainly to the nearest outpatient consultation center (*Centre Médico-Psychologique*). However, it seems important to note that during the year following the attack, no specific follow-up measures were taken for these young people. The participants did not benefit from any systematic individual follow-up or group therapy, and the decision to seek or not to seek mental health care was left to each of them and their families. In addition, no commemoration was organized within or outside the school on the first anniversary of the traumatic event.

Prevalence of Post-Traumatic Stress Disorder

For most children and adolescents, the psychological stress that occurs after a traumatic event is usually of short duration. However, for some young people, symptoms do not improve spontaneously and become clinically significant, persistent, and disabling (1).

The prevalence of post-traumatic stress disorder (PTSD) among children and adolescents who have survived disasters varies greatly from 1% to 60%, depending on the target population and the measures used to establish the diagnosis (2). One of the elements which could explain a particularly important prevalence of PTSD in this young population is the fact that acts of terrorism, unlike other types of disasters, combine a human origin, an intentional aspect, a low predictability, and a short duration (3). Indeed, unlike natural disasters, terrorist attacks are man-made disasters which carry a deliberate intention to harm and destroy (4).

Among young people exposed to terrorist attacks, previous research found increased rates of mental disorders for isolated attacks occurring in countries that were not at war (e.g., Oklahoma City bombing, September 11th 2001) as well as attacks occurring in areas of continued political conflict (e.g., Guatemala, Northern Ireland, Israel) (3). In addition, according to a meta-analysis of all longitudinal studies conducted on populations directly exposed to traumatic events between 1998 and 2010, the prevalence of PTSD would increase over time after "intentional" traumatic events (attacks, war) whereas it would tend to decrease in the long term after "unintentional" traumatic events (5).

In Europe, a recent study about the post-traumatic responses to the July 22, 2011 Oslo terror among Norwegian high school students analyzed PTSD symptoms and showed that 0.8% of respondents reported substantial distress on the reexperiencing item, 4.9% on the avoidance item, and 1.1% on the hyperarousal item. Moreover, 4.9% reported substantial distress in one PTSD symptom area at least, whereas 0.4% reported substantial distress in all three areas (6). The results also revealed a gradual relationship between proximity to terrorist attacks and distress related to PTSD symptoms: the greater the personal proximity to the scene of attacks, the higher the level of distress.

Psychiatric Disorders Following Traumatic Exposure

On the other hand, although PTSD appears to be the most commonly studied reaction, other psychological disorders can also occur following a traumatic event:

- Depressive disorders (3, 7–10);
- Emotional numbness, which would be more suggestive of a depressive response (11);
- Suicidal ideation (12);
- Anxiety disorders (7, 10);
- Behavioral disorders (7), with potential academic and non-academic consequences (13, 14);
- Sleep disorders (12).

The prevalence of anxiety disorders (e.g., social anxiety, agoraphobia) might even be higher than the one of PTSD among youth proximally exposed to terrorist attacks (15). Adolescents are also more likely to manage their symptoms by using substance abuse. Indeed, studies made after terrorist attacks in Israel and after September 11th, 2001 documented an increased use of alcohol, illicit substances, and nicotine among adolescents (13, 14, 16).

Risk Factors of Post-Traumatic Stress Disorder

Several risk (and protective) factors of post-traumatic stress disorder have been identified. They can be classified in three categories according to their temporality:

- **Pre-traumatic factors**: personal or family history of mental disorders, low level of intelligence, low socio-economic level, genetic factors, gender (females), history of abuse or trauma, low pre-existing self-esteem (7, 17–23);
- **Peri-traumatic factors**: which are related to the traumatic exposure: gravity and proximity to the event, duration of exposure, but also factors related to the subjective experience of the event such as peri-traumatic dissociation and distress or the perceived threat of death (7, 17, 24–26);
- **Post-traumatic factors**: related to the subject himself (psychiatric comorbidities, ineffective coping strategies, acute stress disorder) and his environment (low social level, social isolation, poor family functioning…) (7, 24).

For children and adolescents, post-traumatic factors have been identified as being more strongly correlated with the risk of PTSD than pre-traumatic factors (7). Nevertheless, the most important predictors of PTSD seem to be peri-traumatic factors such as peri-traumatic dissociation and the perceived death threat (17). On the other hand, social support appears to be one of the most important protective factors (17, 24, 27– 29).

The Need for Further Research

Victims of a terrorist attack, as well as those who witness or hear about these attacks, are likely to experiment long-term negative effects (30). In order to limit the devastating impact of these events, which are by definition unpredictable and can be highly traumatic, it seems essential to react as quickly and as effectively as possible. The psychological and psychiatric care of the victims of terrorist attacks therefore constitutes a major public health issue.

In addition to the potential somatic and social consequences of such events, many studies documented the impact of terrorist attacks on children's and adolescents' mental health and revealed a significant prevalence of PTSD, but also other psychiatric symptoms (such as anxiety and depression) among these populations (3). However, there is growing evidence of a wide range in prognosis, in terms of mental health, after an exposition to a terrorist attack: most youth seem to recover without any psychological treatment, while others experience persistent PTSD or delayed stress response (31).

Young survivors of terrorist attacks are particularly vulnerable. Indeed, post-traumatic stress is likely to compromise their psycho-social development and academic success with potential long-term effects (32). Therefore, they may need long-term health monitoring in terms of primary and secondary care (33). Nevertheless, several studies showed that in the field of mental health, many needs are not being met in the aftermath of terrorist attacks (34, 35). In addition, existing research in this area is scarce and essentially includes cross-sectional studies (36, 37).

To our knowledge, only one cohort study has been conducted in Europe to assess the impact of a terrorist attack on the mental health of directly exposed adolescents (10). As these attacks frequently involve children and adolescents (37–39), further research is needed to evaluate the use of the different types of existing care structures for young survivors as well as their long-term needs. Therefore, we decided to set up this cross-sectional observational study which is the first step in the constitution of the AVAL cohort study, a cohort of French high school students who were directly exposed to the terrorist attack that took place on Westminster Bridge (London, England) on March 22, 2017.

AIMS

The primary aim of this study is to evaluate the psycho-traumatic impact of a terrorist attack on the mental health of directly exposed adolescents 12 to 15 months after the attack, measuring the prevalence of post-traumatic stress disorder, anxiety disorders, mood disorders, sleep disorders, addictions, and suicide risk in the target population.

Our secondary aims are clinical, epidemiological, preventive, and therapeutic. We will indeed search for alterations in social, family, and school functioning (clinical aim), but also tend to identify which factors are associated with the risk of developing PTSD, anxiety disorders, or depressive disorders 12 to 15 months after the attack (epidemiological aims). We also aim to provide a standardized psychiatric evaluation of the young survivors who constitute the target population, in order to identify and refer to specialists the ones who require psychiatric and/or psychological care (therapeutic aims). Finally, we aim to identify which factors are associated with the fact of seeking medical or psychological advice during the year after the attack, which will help us to assess the needs of directly exposed adolescents in terms of medical and psychological care after a terrorist attack (preventive aim).

METHODS AND ANALYSIS

Design

This study, which will be the first step of the AVAL cohort study, will be a monocentric cross-sectional observational study. It will be performed in a single center, 12 to 15 months after the terrorist attack to which the target population was exposed.

The evaluation will consist of both self-assessment questionnaires and clinician-administered questionnaires. Both these evaluations will last around 1 h and will be performed on distinct days. The hetero-evaluation will be conducted by the same investigator for all participants. Nevertheless, in order to provide a safe space for all students and their families, and prevent any emotional difficulty, volunteers from the medico-psychological emergency cell (*CUMP-29 renforcée*) will be seconded to assist the investigator during all data collection.

Pre-existing personal and family psychiatric condition, family composition, psycho-traumatic history, stressful life events, characteristics of traumatic exposure, early evolution of disorders, and health care pathway since the attack will be explored retrospectively upon the participant's statement. Psychological symptoms and psychiatric disorders will be assessed based on the current health status of participants at the time of evaluation.

Patients' Recruitment

Inclusion Criteria

The 53 students of a French high school who were directly exposed (criterion A1 of PTSD in DSM-5) to the terrorist attack perpetrated on Westminster Bridge in London on March 22, 2017 are the target population of this study.

Exclusion Criteria

We will exclude from this study the three students who were physically wounded during the attack and, therefore, didn't have the same sensorial exposition. However, if they want to, these three teenagers will be offered the same standardized assessment as all participants, so that we can fulfill our aim of clinical screening and refer them to specialized care if necessary.

Measures

Outcomes and Instruments

Supplementary Figure 1 summarizes the variables that will be assessed in this study.

Post-Immediate Evaluation

We will use retrospective data from the clinical evaluation performed during the initial intervention of the medico-psychological emergency cell within 10 days after the attack. Indeed, for most of the 53 adolescents who meet the inclusion criteria, a standardized face-to-face evaluation was conducted. The psychiatric nurse, psychologist, or psychiatrist in charge of this assessment had to record the immediate and post-immediate symptoms of the patient, notify whether the adolescent had missed school or taken any medication since the attack, empirically quantify the psychological impact of the event (mild/moderate/severe), and notify whether a medical certificate had been established or not.

The immediate symptoms sought were anxiety, fear, sadness, psychic sideration, stupor, agitation, panic, confusion, derealization, dissociation, and automatic activity. The post-immediate symptoms sought were sleep disorders, difficulty concentrating, phobias, avoidance, hypervigilance, intrusion symptoms, and feeling of guilt.

Finally, for some of the 53 adolescents (depending on the mental health professional who led the evaluation), peritraumatic dissociation had been assessed using the Peritraumatic Dissociative Experience Questionnaire (PDEQ) (40). This self-assessed questionnaire consists of 10 items describing dissociative experiences which can occur during a traumatic event. Each item is measured using a 5-point Likert scale reflecting the degree to which the patient experienced the symptom that is described, from 1 (not at all true) to 5 (extremely true). The total score is the sum of all items. A score ≥ 15 indicates a significant dissociation. People with intense peri-traumatic dissociation are more likely to develop PTSD (7, 17, 24). This questionnaire has been validated for French-speaking individuals (41) and school-aged victims (42).

Clinical Assessment 1 Year After the Attack: Self-Assessment Questionnaires

Socio-Demographic Data

Age, sex, grade (for those in school), socio-economic level of parents or legal guardians, ethnic origin/country of origin, and family composition will be collected from each participant.

Life Event Checklist for DSM-5

The Life Event Checklist for DSM-5 (LEC-5) (43), which consists of a list of difficult life events, will allow us to look for a possible exposure to a traumatic event prior to the attack of March 22, 2017. This questionnaire explores 17 items. The first 16 correspond to events that could cause a PTSD or psychic distress, while the latter allows to evaluate any other extremely stressful event that would not have been explored by the first 16 items. This checklist will help us to gather information about former traumatic experiences of each participant. There is no formal rating protocol, but the patient may indicate several exposure levels for the same event (happened to me, witnessed it, learned about it, part of my job, not sure, doesn't apply). People who experienced previous traumatic events are more likely to develop PTSD (18, 22, 23) when exposed to a new one.

Adolescents Life-Change Events Scale

The Adolescents Life-Change Events Scale (ALCES) (44) consists of 31 items and explores stressful life events in five domains (family, school, social life, emotional life, and health). We will use this questionnaire to explore stressful life events that may have caused a significant change in the participant's daily life during the year before the attack (first part) and since the attack (second part).

Sheehan Disability Scale

Sheehan Disability Scale (45) is commonly used to measure the impact of psychiatric conditions on daily life. It explores the subject's experience and his perception of the intensity with which events have affected three common areas of his life: studies/work, social life, and family life (46). Each of these three domains is evaluated by the patient on a scale of 0 to 10. The total score ranges from 0 (unimpaired) to 30 (highly impaired), but each of the three subscales can also be scored independently (any score ≥ reveals a significant impairment).

Echelle De Provisions Sociales Abrégée

The Echelle de Provisions Sociales Abrégée (EPS-10) (47) assesses the declared and perceived quality of social support received by the subject. It consists of 10 items, with 2 items for each of the 5 dimensions explored: emotional support, social integration, tangible and material help, guidance, and reassurance of worth. Each item is measured using a 4-point Likert scale reflecting the degree to which the patient agrees or disagrees with the statement from 1 (strongly disagree) to 4 (strongly agree). This questionnaire will allow us to continue to explore the participants' vulnerability to stress by assessing how much social support they feel they get. Indeed, social support appears to be one of the main factors associated with the evolution of PTSD (17, 24, 27, 28).

Family and School Resources

In order to identify social resources, we added eight close-ended questions (answer = yes or no) to complement EPS-10. These questions will help us to assess the perceived role, for participants, of their parents, family, and school social environment (professors, nurse, guidance counselor, etc.). These answers will be confronted with the data collected during the medical interview (see below).

School Performances

To complement the Sheehan Disability Scale, we added three close-ended questions (answer = yes or no) which explore alterations of school performances that may have occurred since the attack (difficulty concentrating, better or worse grades, school absenteeism, repetition, changing fields). These answers will also be confronted with the data collected during the medical interview (see below).

Post-Traumatic Stress Disorder Check-List for DSM-5

The Post-traumatic stress disorder Check-List for DSM-5 (48) consists of 20 items which explore the 20 symptoms of PTSD described in the DSM-5 (49). For each symptom, the patient evaluates the intensity of the symptom during the previous month on a 5-point Likert scale from 0 (not at all) to 5 (extremely). The 20 items can be grouped into four subscales corresponding to the four sub-syndromes of PTSD: intrusion symptoms (items 1 to 5, corresponding to criterion B), avoidance symptoms (items 6 and 7, corresponding to criterion C), negative of cognition and mood (items 8 to 14, corresponding to criterion D), and hyperarousal (items 15 to 20, corresponding to criterion E).

This self-questionnaire allows to obtain a total score of severity (by adding the score obtained for each of the 20 items) or an independent severity score for each criterion from B to E. It can also be used as a diagnostic scale, which is how we will use it: the diagnosis of PTSD will be retained when the global severity score > 32 (48). The prevalence of PTSD 12 to 15 months after the attack, assessed using PCL-5, will be the primary endpoint of this study.

Peritraumatic Distress Inventory

The Peritraumatic Distress Inventory (PDI)(42,50) consists of 13 items and assesses the emotional distress reactions experienced during or immediately after exposure to a traumatic event. Each item is measured using a 5-point Likert scale reflecting the degree to which the patient experienced the symptom that is described, from 0 (not at all true) to 4 (extremely true). The total score is the sum of all items. A score ≥ 15 indicates significant distress. People with severe peri-traumatic distress are at higher risk of developing PTSD (50).

Clinical Assessment 1 Year After the Attack: Medical Interview and Clinician-Administered Questionnaires

All the questionnaires will be administered by the same clinician who is a psychiatry resident (8th year of medical school) supervised by a child and adolescent psychiatrist, and a military psychiatrist who are both trained in psycho-traumatology and have professional experience in this field.

Exceptionally, volunteers from the medico-psychological emergency cell will be seconded to assist the investigator during data collection. Two volunteers will be present each day. One of them will be present during the medical interviews in order to be able to offer the participant a space for dialogue at the end of the interview if necessary, while the second one will be on standby in the high school and welcome any person (student, family, teachers, etc.) who would feel the need to come and talk about the attack.

Genogram

At the beginning of the medical interview, over 15 min, the clinician will produce a genogram, which aims to represent the participant's family on three generations and to highlight the relationships between the adolescent and each member of these three generations. During this interview, the clinician will also search for a pre-existing personal and family psychiatric condition, and ask the patient about his or her hobbies, professional project, and romantic relationships. This introductory time also aims to allow the participant to feel safe and confident in this unknown context of clinical evaluation.

MINI International Neuropsychiatric Interview for Children and Adolescent (M.I.N.I. Kid 7.0.2)

The MINI International Neuropsychiatric Interview (51) is a brief structured diagnostic interview developed by American and European psychiatrists and clinicians. Although it can also be used as a self-assessment questionnaire, it lowers its psychometric performances, which is why we chose to use it as a clinician-administered questionnaire.

The MINI Kid, which is dedicated to children and adolescents, explores the most frequent and most relevant disorders in child psychiatry: mood disorders, suicidality, anxiety disorders and PTSD, addictions, motor disorders, hyperactivity, behavioral disorders, eating disorders, and psychotic disorders.

David V. Sheehan, as "copyright holder" of the all versions of "MINI International Neuropsychiatric Interview for Children and Adolescents - M.I.N.I. Kid 7.0.2 (8/8/16 version)," granted permission to Nathalie Coulon, MD-PhD in CHU Brest (France), as healthcare providers, to use this interview under terms and conditions which we respected.

Psychoactive Substances Use

To complement the MINI Kid, we will use eight close-ended questions to explore whether the psychoactive substances use

has changed or not since the attack. We will focus in particular on alcohol, tobacco, and cannabis, which are the most frequently used substances in the age group of the target population.

World Health Organization Disability Assessment Schedule 2.0
In order to explore any functional impairment, the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0), which was developed in connection with DSM-5 (49), will be used to measure health and disability through six areas of daily life: cognition, mobility, self-care, getting along/interacting with other people, life activities, and participation (joining in community activities). As a generic instrument, WHODAS 2.0 can be used to measure the functional impact of any pathology. The full version consists of 36 questions, but we chose to use the short version administered by an investigator, which brings together 12 items. These 12 questions explore the operational difficulties experienced over the last 30 days in the six areas detailed above. The 12-item short version explains 81% of the variance of the long version.

Psychological and Medical Care
To conclude the medical interview, the clinician will explore the psychological and medical care that the participant may have sought and/or received since the attack. Using nine questions (eight close-ended and one semi-open), we will explore the health care pathway followed by the participant since the attack, providing information about the types of medical and/or psychological care the patient received (medical/psychiatric/psychological care, psychotherapy/medication), when (during the first week following the attack or not) and where (type of healthcare structure).

If the participant did not seek any psychological or medical care, the clinician will notify why (the participant didn't want to, the participant's parent or legal guardians didn't want him/her to, the participant didn't feel like he or she needed help, the participant or his/her legal guardians didn't know where to go to get help, the participant or his/her legal guardians thought it was too soon to get help, other reason).

Finally, to limit the clinical bias in our evaluations, we will notify any current medication.

Statistical Analysis

Descriptive statistics of the population will include the number of missing data, the mean, the standard deviation, the median, the minimum, and the maximum for continuous variables, as well as frequency and percentage for qualitative variables.

The baseline characteristics of the sample will be compared between adolescents who did or did not develop PTSD using comparison of means (Student test or Wilcoxon test) or of frequencies (Chi-square test or Fisher's exact test).

Analysis of correlation will also be performed in order to investigate whether some of the factors we evaluate might play a role in the development of PTSD.

DISCUSSION

To our knowledge, only one cohort study has been conducted in Europe to assess the impact of a terrorist attack on the mental health of directly exposed adolescents (10). However, in that study, most interviews were conducted 5 to 6 months after the attack, therefore providing a very different timeframe. In addition, according to its authors, that study lacked "*measures of pre-trauma health conditions, demographic information and psychosocial interventions post-trauma*," which may have influenced the outcome of the study (10). In our study, we will try to address these limitations by collecting data about exposition to previous traumatic events, family composition and relationships, pre-existing personal, and family psychiatric condition as well as the psychological and medical care that the participant may have sought and/or received since the attack.

In addition, as all the members of our target population were going to the same high school, we will be able to identify all the survivors who meet our inclusion criteria, therefore allowing us to hope for an exhaustive recruitment of the target population.

The early intervention of the medico-psychological emergency cell, who operated within 10 days after the attack, will also allow us to collect precious retrospective clinical data such as the immediate and post-immediate symptoms of the participant, early school absenteeism, and quantified post-immediate psychological impact of the event (mild/moderate/severe).

Finally, the fact that the hetero-evaluation will be conducted by the same investigator for all participants reinforces the power of our study. However, we made sure that this investigator would be accompanied, throughout the collection of data, by mental health volunteers who have been trained to take care of people facing a traumatic event, which will allow us to provide a safe space for all participants and their families.

Despite these strengths, our study is subject to several limitations. First, due to the cross-sectional design of the study, we will not be able to establish causal relationships. Second, with a target population of only 53 individuals, the number of patients will necessarily be limited. Third, the data collected through the post-immediate evaluation was gathered outside of any protocol at that time, which makes it barely scientifically exploitable. This initial data is thus very different from the one we will collect 12 to 15 months after the attack, which will not allow us to compare them.

Fourth, although the home and school environment seem to play a key role in modulating children's and adolescents' reaction to terrorism (7, 29, 52–54), our evaluation of this environment will be superficial. It would be interesting to conduct a real systemic assessment among these adolescents including interviews with their teachers and families, but unfortunately this cannot be done as part of this study.

Finally, it seemed to us that collecting data for this study 1 year after the terrorist attack would increase our chances of including most of the target population while minimizing the risks of disruption for the students and their families, since they would probably already be thinking about the event. However, the choice of this date could be a source of bias. Indeed, it is possible that the symptoms of post-traumatic stress, depression, and anxiety are more important around the first anniversary of the traumatic event.

Another potential source of bias could come from the fact that the teenagers who constitute our target population were particularly preserved from the mediatic exposition in the aftermath of the attack. Media participation can be perceived as distressing by terrorist attack survivors and be associated with more post-traumatic stress reactions (55). As explained by Aakvaag et al., "*Survivors may also experience that the portrayal of them as a group in media or other contexts is overly heroic or positive, which may not correspond with their private experience of trauma*" (56). However, on the other hand, the massive public attention of mass trauma such as terrorist attacks can result in surrounding populations expressing their support for and sympathy with victims (57). Therefore, it is also possible that the low coverage of this attack by French media deprived the participants of a social support that could have reduced their risk of developing post-traumatic stress reactions. Indeed, as explained earlier, social support appears to be one of the main factors associated with the evolution of PTSD (17, 24, 27, 28).

Finally, group effects could also be a source of bias in this study. Indeed, all the participants went to the same school at the time of the attack and most of them stayed in the same high school afterwards, which implies that just as it was the case with the victims of the Beslan terrorist attack, the participants had to face other victims of the traumatic event on a daily basis. On the one hand, it might have been helpful for them to get mutual support from people who share similar experiences. However, on the other one, daily confrontation with other victims of the same attack seems likely to act as a constant reminder of the traumatic event and therefore to increase the risk of developing post-traumatic stress reactions.

This study has a major preventive aspect for the target population. Indeed, all directly exposed adolescents will be offered the same standardized assessment and receive a message of prevention with contact details of caregivers, whether they want to be included in the study or not, so that we can fulfill our aim of clinical screening and refer them to specialized care if necessary.

This study is also intended to provide epidemiological data about the psycho-traumatic impact of a terrorist attack on the mental health of directly exposed adolescents and to describe these adolescents' health care pathways. These clinical and epidemiological information could help healthcare professionals and public authorities to better adapt their immediate, post-immediate and delayed response strategies after a major psycho-traumatic event involving adolescents, and in particular after terrorist attacks. Finally, assessing healthcare pathways followed by participants since the attack will help us to evaluate the needs of directly exposed adolescents in terms of medical and psychological care after a terrorist attack and, if necessary, to alert public authorities to needs which are not being met.

ETHICS STATEMENT

As it involves human participants, the protocol of this study was approved by Comité de Protection des Personnes Ouest IV—Nantes. Written informed consent to participate in this study was provided by the participants' or their legal guardian for minors.

AUTHOR CONTRIBUTIONS

J-PS was one of the psychiatrists from the initial intervention and had the idea to develop a study. MG designed the protocol with the methodological and scientific support of NC. The protocol was revised by NC and J-PS. MG drafted the manuscript, apart from the Statistical Analysis part, which was drafted by MC. J-PS, NC, and CL revised critically the article for important intellectual content. All authors approved the final version of the article.

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Silence, Rebellion, and Acting-Out of a Silenced Past: Understanding the French Riots From a Postcolonial and Transcultural Perspective

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Context and Objectives: According to a sociological study, the adolescents involved in the "suburban riots" of November 2005 were French nationals with a foreign background, including 55% of North African descent. Numerous attempts to interpret the "riots" have been made, but none of them has discussed the impact of the "silenced" colonial history on their filiation. For this reason, the present research set out to overcome this shortfall.

Methods: Using a complementarist, transcultural, qualitative research methodology, 15 interviews with French adolescents of Algerian descent were analysed.

Results, Analysis and Discussion: The analysis of these interviews highlighted the impact of the past violence in France's colonial history on family dynamics and intergenerational relationships, which seemed to play a crucial role in the unconscious component of transmission within these families. This discovery led us to a new understanding of the 2005 revolt, envisaging it as a symptom of a disorder situated on several levels: on the level of subjectivity, of trans-generational relationships, and also on the level of social cohesion within French society. The interviews showed how the young interviewees related their current anger to French colonial and post-colonial history.

Conclusions: These observations led to a new understanding of the "riots" as a form of acting-out of anger linked to contemporary and past experiences of domination and exclusion.

Keywords: riots, urban poverty, colonialism, traumatism, adolescence, transgenerational

CONTEXT

The November 2005 "suburban riots" in France led to a feeling of astonishment and bewilderment in French society. During a period of three weeks, these riots gave the police forces no rest. There were no official leaders and no particular demands, yet the riots spread across the whole French territory. They were sparked off by the death of Zyed Benna (17 years old) and Bouna Traoré (15

years old), two youngsters who died from electrocution while trying to escape from the police (1). What happened exactly? On October 27th, a group of about a dozen teenagers had been playing soccer. After play, they set off home for dinner (it all happened during the daytime hours of the Moslem Ramadan fast). As is often the case, the police were carrying out identity checks, focusing particularly on young people in the suburbs where there is a large proportion of families with a migrant background. What often happens when teenagers see police officers checking people's IDs is that they run away. Zyed Benna, Bouna Traoré and one of their friends ran away from police officers who chased after them, even when they saw that the boys had gone into an electrical substation, trying to hide. All three of them sustained a powerful electric shock, which caused the deaths of Zyed Benna and Bouna Traoré. That same evening, violence broke out in their very poor eastern suburb in Paris. Initially confined to the Paris area, the unrest subsequently spread to other cities in France.

OBJECTIVES

According to a sociological study (2, 3), the adolescents involved in these "suburban riots" were French nationals with a foreign background, including 55% of North African descent. The peculiarity of these rioters appears as their links with the history of France and its former ancient colonies. In a way, these young people may be considered as inheritors of the historical relationship between France and its former colonies. Although there have been many attempts to explain the "riots", the impact of a "silenced" colonial history on these young people (including the impact on trans-generational relationships) has never been explored. For this reason, the present research set out to bridge this gap. We tried to understand whether or not the traumatic colonial past had an impact on their feelings, and consequently on the events, and how this came about. We also sought to understand what motivates French teenagers' contemporary affiliations, and how they perceive their contemporary world.

METHODS

The study involved encounters with 15 young people of Algerian descent (proportionally the largest population of French nationals originating from former colonies) for individual research interviews, to understand the reasons for their anger. The 15 young people interviewed were young men aged 18 to 25 years (**Table 1**). The mean age was 20. Contacting these young people required anthropological work to be carried out in a context of cultural proximity, a sort of domestic anthropology in suburban Paris (4, 5). More precisely, it consisted in the researcher setting up residence in these districts for several weeks to facilitate encounters. Six interviews were conducted at the heart of the Seine-Saint-Denis urban estates with young people who were experiencing difficulties or who had dropped out of school. These interviews concerned Jawad, Aziz, Bilal, Farid, Amir and Mounir. One main issue was to find out whether this expression of anger could also be found among young people who were doing well at school. A recruitment of subjects from a university was thus decided, and over a two-year period, six further interviews were carried out. They involved Nadir, Younes, Karim, Habib, Adam, and Mourad. In addition, because these riots had spread across France, three young people were met outside the capital, through acquaintances: Tariq, Kamel and Salim. The interviews took place in a normal life setting between 2010 and 2011, in the aftermath of the "riots", following a period of psychological elaboration during which memories were given form. They lasted between 30 and 90 min. The mean duration was 1 h. The subjects in this study were therefore teenagers at the time of the 2005 riots. The semi-directive interviews were focused on four lines of approach: the family's migratory trajectory, to obtain a historical perspective; the perceptions of contemporary social reality; the perceptions of rebellion or rioting; and the representations linked to Franco-Algerian colonial history. The interviews were recorded and the verbatim was transcribed. All the participants gave their written informed consent. The young men could refuse to continue the interview at any time. For ethical reasons, the data shown here has been made anonymous.

TABLE 1 | Socio-demographic data for the research population.

Name	Age	Studies/professional activity	Nationality	Parents' origin
Jawad	20 years old	Dropped out of school at 16 Unemployed	French	Algerian
Aziz	22 years old	Cookery training course Works in a restaurant	French	Algerian
Bilal	20 years old	National Higher secondary Diploma	French	Algerian
Farid	19 years old	Dropped out of school at 16 Unemployed	French	Algerian
Amir	18 years old	Dropped out of school at 16 Is looking to further his education	French	Algerian
Mounir	25 years old	2 years post BAC in Law studies Community life officer	French	Algerian
Tarik	23 years old	3rd year psychology student at university	French	Algerian
Kamel	25 years old	Technical diploma in mechanics Mechanic	French	Algerian
Salim	23 years old	BAC Unemployed	French	Algerian
Nadir	21 years old	1st year at University for a two-year training qualification	French	Algerian
Younes	21 years old	1st year at University for a two-year course	French	Algerian
Karim	18 years old	1st year at University for a two-year course	French	Algerian
Habib	20 years old	1st year at University for a two-year course	French	Algerian
Adam	20 years old	1st year at University for a two-year course	French	Algerian
Mourad	18 years old	1st year at University for a two-year training qualification	French	Algerian

The methodological approach applied to this transcultural research is based on Georges Devereux's notion that human phenomena require the discourse from both psychology and sociology, but not simultaneously; indeed, a "raw fact" does not altogether belong to a specific domain. It is only through explanation within the field of either science that raw facts are converted into psychological or sociological data (6). This complementarist approach therefore requires the different theoretical fields of the social sciences to liaise, so as to facilitate the study of complex objects (7–9). If we consider that there are collective and historical components to humans' subconscious singularity, our research contributes to a dialogue between history, psychoanalysis and post-colonial studies.

A longitudinal analysis was carried out, taking the form of individual portraits, followed by a cross-sectional analysis. This second step helped to evidence recurrent themes *via* the use of Grounded theory (10). This is an inductive research method aiming to build a theory based on the collection of empirical data. Unlike hypothetical and deductive approaches, the aim here is not to validate or invalidate an initial hypothesis. It is the data itself that shows the way. From this exploration, the material was interpreted, looking for links between what was said and what was not said, between discourse on past history and discourse on everyday life in the community. In a proximity with clinical practice, with all the complexity arising from the research perspective, we paid considerable attention to the unsaid, the allusions, the omissions, and what cannot be told and hence is not immediately obvious in the discourse of the different individuals. This data analysis method enabled the meaning of events to be highlighted, by linking a variety of elements within the same situation, whilst remaining centred on latent aspects of what the subjects expressed, particular attention being given to subjectivity and the search for explanations.

RESULTS AND ANALYSIS

Institutional Relationships That Return to Patterns of Colonial History

The adolescents stated that the police did not treat them fairly, systematically suspecting any "Black" or "Arab" young person. According to Bilal, there is no need to have committed a criminal offence to be considered a suspect, merely walking in the street is enough to become one. According to Amir, policemen take all kinds of liberties towards them because "they know that even if we lodge a complaint against them, they will be the ones who win and not us, because we are from the suburban estates." For them, encounters with the police during identity checks are the brutal expression of arbitrary force, and many of the youngsters linked this experience to the arbitrary segregation during the colonial period. The identity checks are experienced as an expression of inequality within French society. They nevertheless felt unable to contest this inequality, and many of them considered running away to be the only option they had when encountering police officers, even if they had not transgressed any law. Being confronted with the police is considered to be dangerous, even fatal, as in the case of the two youngsters who died in 2005. Some of the interviewees used the same terms to describe their encounters with the police as they used when talking about encounters their parents and grand-parents had had with colonial officials. They said: "the police harasses us every day" and "they oppress us." And they used exactly the same words when they tried to explain how their parents lived during the colonial period. They said: "they harassed our parents" and "they oppressed them".

School appears as a space where the desire to "get on" in the world is hampered by problems of segregation; it is a reminder of colonial times, when "indigenous" people were not expected to get far in their schooling (secondary school being generally the highest education reached). Tarik, who was in 3rd year psychology at University, described suburban secondary schools as machines designed to "mis-(dis-)orient" "Black" or "Arab" young people by pushing them almost systematically towards short vocational training courses. That was what had happened to him. His teachers wanted him to enrol on a shorter training program. But Tarik's elder brother, who had gone through the same process, opposed this decision. Some of the youngsters in this research said how bitter they felt about the fact that their parents had not been allowed to attend school or pursue an education in colonial and postcolonial times. Kamel asked: "My grandfather lived in poverty, my parents lived in poverty … Why was the opportunity to go to school not given to my mother?" Most of the youngsters described how they felt betrayed in their love for school when reaching the end of secondary school. With emotion, Younes remembered: "frankly, It was just like that when the time came to decide what course to choose, I used to cry a lot in the schoolyard…" Further on, he added: "we are not encouraged by teachers … We are discouraged to continue our schooling because they are convinced that "Black' or "Arab' learners cannot be successful beyond a certain level." These young people felt a real sense of abandonment by the teachers.

Having inherited France's colonial past, these youngsters experience the violence of a past racist phenomenon that seems to endure in today's reality with its collective indifference. The absence of support in the youngsters' failing environment is experienced as a structural disenchantment towards them. In this situation of deprivation (Hilflosigkeit), which has now been going on for several generations, they express overwhelming feelings of distress, hopelessness, worthlessness and helplessness.

Identity

Most of the adolescents described the suburbs as a rough place where they are constantly confronted with exclusion and tempted to engage in delinquency. This was described as a real risk for the more vulnerable. A lot of them were jobless and felt left behind "because of what we are" and "what we are supposed to be," as a result of their physical appearance. When talking about the suburbs, Karim said that "Black" or "Arab" families had been "parked" "on the fringes of the Republic" and that young people were born and grew up on these fringes. The birth

of a child necessarily occurs within a specific lineage, with a place in the genealogy, history and geography. Each child has paternal and maternal affiliations, which later provide a sense of belonging to a community. If for most adolescents, puberty is experienced without particular difficulties, but for others, this period can be more difficult, and even stressful. From a dynamic perspective, puberty is characterized by a libidinal eruption. This energy leads adolescents to seek to discharge non-elaborated tension. With the reactivation of the Oedipus conflict, personal and sexual identities attempt to construct the Subject, while more archaic psychic conflicts weaken the Self, in its pare-excitation role. Furthermore, during adolescence, questions of filiation and affiliation take on specific meanings (5). Ontological, identity-related questions arise: Whom do I look like? To whom do I belong? And who do I want to be? (11). The psychological processes of adolescence run alongside changes in the body linked to puberty. It is a violent experience for adolescent subjects, a form of trauma that overwhelms them. This violence highlights the traumatic effect of puberty, "the occurrence of a psychological conflict and a traumatic development in pubescent adolescents" (12, p. 41). This violence is necessary for subjects who have lost their childhood status with its imaginary world and points of reference, only to be confronted with an extremely frightening newness. It is nevertheless necessary, since it allows new perspectives to be opened up towards individuation and subjectification. However, adolescents can also be tempted to rid themselves of this internal violence, which they express as a trauma when they are overwhelmed and not able to contain and transform this energy of violence (13). They therefore have no choice but to turn this violence against themselves or project it onto the outside world. This violence could be defined as a mode of defence against a real or imaginary attack, a weakness in their identities that makes them feel threatened. It is a psychological process of transformation that is consubstantial with becoming an adolescent. But the teenage years are harder for some than for others, because becoming a healthy functioning adult also depends on the social context. These young people experience their suburb as a space that is at once part of the French republic and not part of it. They described the strange experience of being, at the same time, inside and outside French territory. The experience is linked to shame, anger and disgust: one of the youngest interviewees, Habib, talked about the suburb being a "mirror" the young people were living with, a mirror to France's colonial past, reflecting "a piece of shit that they have to eat every day." When talking about the way they are perceived by others, many of them talked about images they had to deal with, and they described them as images that were constantly reproduced within French society. They are French, but at the same time they are treated as if they were not really part of French society. This recalls the second-grade status colonial subjects had in the past: the "indigènes" or "natives." The Franco-Algerian philosopher Sidi Mohammed Barkat (14) described this "legal limbo" as neither real inclusion, nor full-blown exclusion, but the indefinite hanging on for some future inclusion. He argued that this legal limbo enabled the French to treat the colonized as a less-than-human *mass*, but still subjected to a humanizing mission; they were only able to become fully human once they had cast off all the features that the French used to define them as part of the "indigenous" mass. In a way, the teenagers saw themselves as being part of an image constructed by others: part of a de-individualized mass, being a "suburban youth," a "delinquent," or eternally a "child of immigration descent." They considered that these labels identified them as undesired by society, in need of reform and discipline as though they were delinquents, thus misrepresenting their distress (15). Behind the rage they feel, these youngsters were ashamed of being seen as dangerous foreigners, or terrorists. Here, shame takes root in the feelings of being unworthy, being or having something that is not "normal" with regard to the social context.

Fight for Life

There are many reasons for the anger that emerged in this revolt, but one thing that seemed important to us was that it was triggered by the *death* of the two adolescents. The young interviewees talked about them as victims of a "racist crime" reminding them of the day-to-day experiences of racism in their encounters with the police. A lot of them said "it could have been me or my little brother." On a more intimate level, the death of these youngsters appears to mirror another deeper personal experience: the "death" experience of their subjectivity, the impossibility of being seen, or voicing their experiences. There are strong links between this experience and that described in relationship with the colonial past. We wonder whether these young people were not trying to force the dominant society to look at the silenced and "forgotten" components of the discriminatory past in French history and its impact on current French society—an intimate and collective rebellion that shows the will to exist, to struggle against depression and despair, and to fight the risk of implosion by externalising and exploding (16). In this adolescent revolt, the effects of collective denial alongside the parental traumas of the past, meet the potentially traumatic effects of "pubescent adolescents" (13). It is the articulation of all this violence that explains their violent acts, acts committed to remain visible. By rebelling against the established order that they consider unjust, these teenagers break its rules. Their violent acts could be understood as the only solution to the collective obstinacy, the violence, the deafness and the blindness, in a contemporary and historical context of abandonment. What the interviews showed were surprising parallels between the current experience of exclusion and the colonial past, even though these parallels were not elaborated. The anger, and sometimes the rage of these young people is linked to their everyday life experience of exclusion, but it also seems to mirror France's colonial history. This is why the anger felt today is also linked to the non-elaborated cryptic transmission of a colonial past.

DISCUSSION

The adolescent interviewees described a collective amnesia concerning the colonial past, a subject that is never brought up

or discussed in public spaces. This silencing prevents any understanding of the impact that this past has on the present situation or of the way these adolescents experience life in today's world. The absence of elaboration of the colonial past in school, and the denial of the physical and symbolic violence of the colonial past, reinforces the family dynamics whereby traumatic experiences become unspoken "cryptic" elements thus triggering an acting-out of the violence that cannot otherwise be elaborated. As pointed out by Abraham and Torok, two psychoanalysts working on the transgenerational transmission of trauma, "cryptic phantoms" can persist and haunt generations, passing from parents to children. The phantoms seek resurrection, resuscitation, and this will occur even if children must silently incorporate them within their psyche. What Torok means by "phantom" is a formation in the dynamic unconscious that is found there not because of repression by the subject, but on account of a direct empathy with the unconscious or rejected psychic matter of a parental object (17). The violence of the past has given their parents a life of non-existence, which the children inherit in silence and experience for themselves. There are three fundamental aspects in filiation. The first one concerns the transmission of the family name, as the social norm defines it. It is linked to rules, laws, and institutions. The second one corresponds to the relationship between the mother and her child. The last one is related to narcissistic filiation, which concerns the affiliation process in its fantasised and imaginary dimensions (18). But for these adolescents, trauma has usually destroyed the first and the second aspects of the filiation link. We therefore consider these adolescents as having a traumatic filiation and affiliation. This effect adds complexity to their psychic construction: how is it possible for them to answer questions about their belonging? How is it possible to answer questions related to their identity? In the same way as their colonized parents, they seem to have only two possible choices, brought to light by Frantz Fanon (16): explosion, to protect themselves from implosion, or violence to protect themselves from petrifaction. In the "country of human rights" where we brag about the French model of integration, the young generation of North-African or other colonial descent is still feeling left behind by their own country, unfairly subjected to police checks, segregated in the low-class suburbs that are becoming ghettos, left to fail in school, jobless, etc. They are hopeless and think that the situation cannot change because they are not wanted by their country: France. Colonization is part of French history and if we want to avoid the acting-out of the unsaid, we should accept and discuss this past. France has to face its colonial past with its inheritance. The fourth generation of the so-called "children of migrants" is already here. They are also "our children of tomorrow" (5), that is why we need a "decolonization of the French imagination" (19). Then this French youth could finally constitute itself as a subject of memory and history, with the possibility of symbolizing, and remembering. This may be a way out of the "cul-de-sac" which appears as a central point in our research: a conflict-ridden hybridization. To restore the social link, we need to make sure that there is transmission and critical discussion of the past. The elaboration of history should be actively undertaken in social and political life, but it also should have its place in psychotherapy, especially in the context of trauma. As xxxx has said, we can see how the cultural, political and social parameters, in other words the collective parameters, complicate individual analyses, and how the way we look at these young people shapes them and sometimes imprisons them (5). We should think about our psychological conceptions of these teenagers' problems and consider the impact of history on their experience.

Evidence for a close link with colonial history has been upheld in a book entitled *The French Intifada: the long war between France and its Arabs* (20) by Andrew Hussey, a British historian and a specialist in French culture. This "long war" can be seen in the unfolding of many contemporary violent debates on Islam and the wearing of the veil in France. The bodies of women have become a central issue in a fierce debate as a result of an unresolved colonial conflict. In this explosive context, citizens are starting to gather against the spread of islamophobia. It can also be added that Amnesty International, in a report on discrimination towards Moslems in Europe, published on April 24th 2019, denounces French islamophobia.

CONCLUSION

In a similar way to that described by Schneider (21) in the United States, in France minorities derived from the former colonies start riots because they are reduced to a sense of powerlessness, with no alternative, and because they have to face discriminatory police violence that is sometimes fatal and remains unpunished. This was also the case in the United Kingdom, particularly with the death of a young black man called Mark Duggan who was killed by the police in August 2011 in Tottenham. The judges concluded that the police were within their rights (22). In his book entitled "Why I am no longer talking to white people about race" (2017), Eddo-Lodge documented racial riots and confrontations involving fatalities in the United Kingdom from the 1960s up to the present. The fear, injustice and powerlessness felt by minorities faced with the risk of dying at the hands of the police is a theme common to all these riots. But our research brings to light an understanding of these phenomena that cannot be reached without exploring a past haunted by a historical disaster. It would be interesting to confront our research findings with other experiences, such as the riots in London and its suburbs. It would help to find other dimensions of the processes of silencing the past. We know that the rioters in London were essentially young blacks from poor neighbourhoods. What is their family background? What is the historical relationship between their origins and Britain? Even if the collective histories are specific and therefore different (slavery, colonialism, etc.), we know that cryptic phantoms can persist and haunt through generations, passing from parents to children. While this involves the descendants of colonised peoples, it can be wondered how this articulates among the descendants of the colonisers entertaining islamophobic positions today.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MM: Researcher. MRM: Director of research. MF and ME: Helped with the transcription of the verbatim. ED and JL: Helped with the methodology.

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The Impact of Children's Pre-Adoptive Traumatic Experiences on Parents

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For the last decade, children are adopted increasingly at an older age. Their pre-adoptive past can bare traumatic experiences consequent to abandonment, violence, or deprivation in birth family or orphanage. The objective of this study is to explore the impact of the child's traumatic past on parental representations and subsequent parent-child interactions. The study includes 41 French parents who adopted one or more children internationally. Each parent participated to a semi-structured interview, focused on the choice of country, the trip to the child's native country, the first interactions with the child, the knowledge of the child's pre-adoptive history. The interviews were analyzed according to a qualitative phenomenological method, the Interpretative Phenomenological Analysis. Five themes emerged from this analysis: absence of affects in the narrative; denial of the significance of the child's traumatic experiences; perceptions of the uncanny concerning the child; parental worry about traumatic repetition for the child; specific structure of the narrative. These extracted themes reveal a low parental reflective function when the child's past is discussed. They highlight the impact of the child's traumatic past on parents. Exploring the impact of the child's traumatic experiences on adoptive parents enables professionals involved in adoption to provide an early support to these families and to do preventive work at the level of parental representations and family interactions.

Keywords: pre-adoptive trauma, adoptive parents, reflective function, traumatic impact, adoptive children, otherness

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INTRODUCTION

Before adoption, international adoptees often experience insufficient medical care, malnutrition, maternal separation, neglect, and abuse as well in orphanages as in their family of origin. This risk to live traumatic experiences is even higher, when children are adopted at an older age. Adoption-research is interested in the impact of these adverse pre-adoption experiences on the children's social and emotional development (1, 2), but also on their family relations and the filiation process.

Adverse pre-adoption experiences increase the risk of post-adoption psychosocial maladjustment, especially with externalizing problems (3–6). But a 50-year follow-up research—The British Chinese Adoption Study—gives as an example of good outcomes in psychological and social adjustment, despite early years of adversity. Scores on mental health assessments were equivalent to the non-adopted, age-matched comparison group (7). However, an important theme, that emerged from the analysis of the children's adjustment, is trauma (8).

Postadoption experiences, such as quality of parent-child relationship mediate these preadoption experiences to produce different outcomes (9). Even when exposed to preadoptive stressors—such as prenatal substance exposure, child maltreatment, and out-of-home placements— the family sense of coherence has a significant impact on adoptees' psychosocial adjustment (10). The impact of adverse pre-adoption experiences on the adoptees' mental health—their psychological distress, externalizing problems, and even academic achievement—is mediated by the quality of parent-child relationship (11, 12) and the parental stress (13).

The post adoptive family relationships thus represent a protective factor on the adoptee's emotional and social development. It is thus important to understand the impact of these adverse pre-adoption experiences on the parents, the challenges they face as well as their parental abilities (14–16). Using the Parent Development Interview (17) with adoptive parents, Steele et al., (18) showed that parents of late placed adopted children and children with multiple placements prior to adoption, experience higher levels of anger and hostility toward their children, experience a greater need for support, and report higher levels of child aggression, child rejection, child controllingness, and overfriendliness. Cairns (19) explores the phenomenon of 'secondary traumatic stress' in which caring for their children who have been traumatized has a traumatizing effect on the adoptive parents. Wilburg (20) shows how the traumatic experiences of adoptees impact their mothers' mental health, as they suffer from one or a combination of chronic stress, depression, or anxiety after their adoptions. The confrontation with the child's trauma disrupts the filiation process (21) and is associated with more placement moves, adoption disruption, and inconsistent parental commitment (22). These disruptive relations in persons with traumatic experiences result from defensive mechanisms deployed. Denial is a common defense mechanism observed in traumatic experiences. It serves the adaptive capacities of the psyche to contain traumatic experiences that remain cleaved away from the thinking capacity (23).

This qualitative study focuses on parents' experiences of their child's pre-adoptive, and possibly traumatic, experiences. Adopting parents are indeed confronted with their children's pre-adoptive experiences through the narrative given by the orphanage or by the institutions in charge of the adoption, or through the children's accounts when they are adopted at a later age. These pre-adoptive experiences can be traumatic for the children as a result of separation from their birth mother or family, life conditions in the biological family or at the orphanage, somatic illnesses or accidents, or ill treatment, neglect, or abuse. What impact does this confrontation with their children's pre-adoptive experiences have on adopting parents, and more precisely on the development of a filial link and parental representations of their child? This issue was addressed in the present study using semi-directive interviews with parents who had adopted one or several children from abroad.

MATERIALS AND METHODS

Participants

The participants of the research adopted at least one child from a country other than France. No other inclusion criteria were defined. The sample consisted of 41 adoptive parents who volunteered to participate in the study, 31 mothers and 10 fathers. This gender difference is due to a higher acceptance for participation among mothers. The sample size was determined by data saturation: when the in-depth analysis of the interviews no longer produced the emergence of new analytic themes, we stopped the inclusion of new participants.

Overall, 26 parents were married and 15 had adopted as single parents. When children had been adopted by couples, we asked both parents to participate in the research. Interviews were performed separately for each parent. The 41 parents in this study included 10 couples in which both parents (father and mother) participated, that is, 20 parents. The remaining 21 parents were mothers: 15 adopted as single mothers, while 6 adopted with their husbands, who did not participate in the study (see **Figure 1**)

Six parents had two internationally adopted children and one mother had three. They were interviewed respectively twice or three times (one interview for each child). We conducted a total of 49 interviews (see **Figure 2**).

Parents' ages at the time of their children's adoptions ranged from 28 to 49 years and at the time of the interview from 31 to 60 years.

Parents lived in urban areas of France. Most (n = 38) were college-educated professionals. They were recruited through adoption associations and connections between adoptive parents.

These 41 parents had adopted a total of 36 children: 19 were girls and 17 boys. At the time of their adoption, their ages ranged from 2 weeks to 7 years. Thirteen children were younger than 1 year at the moment of their adoption, 9 were between 1 and 2 years old at adoption and 14 were older than 2 years. They were adopted in the following countries: Algeria, Armenia, Bulgaria, Brazil, Cambodia, Central African Republic, China, Colombia, Ethiopia, Guatemala, Haiti, India, Lithuania, Madagascar, Mali, Poland, Romania, Russia, Thailand, and Vietnam. At the time of the interview, the children's ages ranged from 15 months to 17 years (see **Figure 3**).

The sample was thus diversified in terms of age, life stage (i.e. families with young children or adolescents), and family structure (single parents and married couples). Following a qualitative research sampling technique (24), we adopted a purposive sampling, as we selected subjects who were typical for the population of interest.

Data Collection Procedure

We conducted semi-structured interviews. The interview guide was developed after a review of the international adoption literature. Different topics were covered, including the choice of country, the trip to the child's native country, the first interactions with the child, the knowledge of the child's pre-adoptive history.

The interviews were conducted at the researcher's office or the parent's home, at their convenience. Their average length was 1 hour, depending on the participants narratives. With their permission, the interview was audio-taped and later transcribed. The research material was then analyzed by two different researchers (AH, SS), each of them trained in the fields of international adoption and qualitative research methods.

Questions were designed to obtain specific information while remaining flexible so that the interviewees could tell their stories. Open-ended questions allowed participants to interpret the meaning of the question and respond according to their personal feelings. Interviewers used prompts and probes as needed to enrich the discussion. We chose to collect data through semi-structured interviews because this method combines an approximate standardization of questions with the opportunity for subjects and interviewers to expand their answers when appropriate. The interviewing process produced deep and broad data that focused on the research question: how subjects described their experience of their first meetings with the child they were adopting.

Data Analysis

The interview data was analyzed according to the Interpretative Phenomenological Analysis method (IPA) (25). This qualitative research method permits the exploration of the participants personal experiences and unique representations of their child's pre-adoptive history, through a detailed examination of the participants' personal perceptions and lived experiences. We thus conducted an in-depth qualitative analysis. Through an iterative inductive process, we proceeded to a detailed case-by-case study of each interview transcript. We began with several close detailed readings of each interview to provide a holistic perspective, noting points of interest and significance. Through a step-by-step

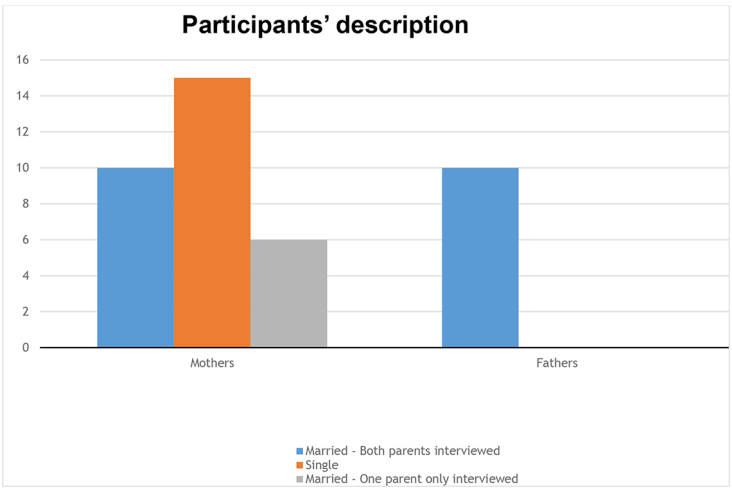

FIGURE 1 | Particpant's description.

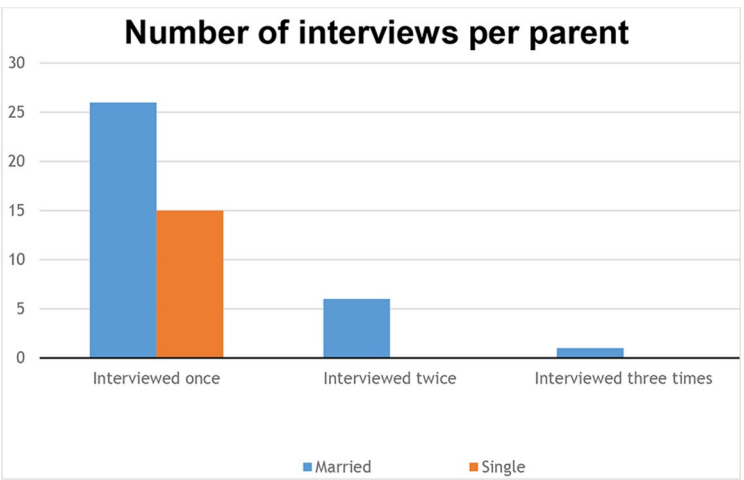

FIGURE 2 | Number of interviews per parent.

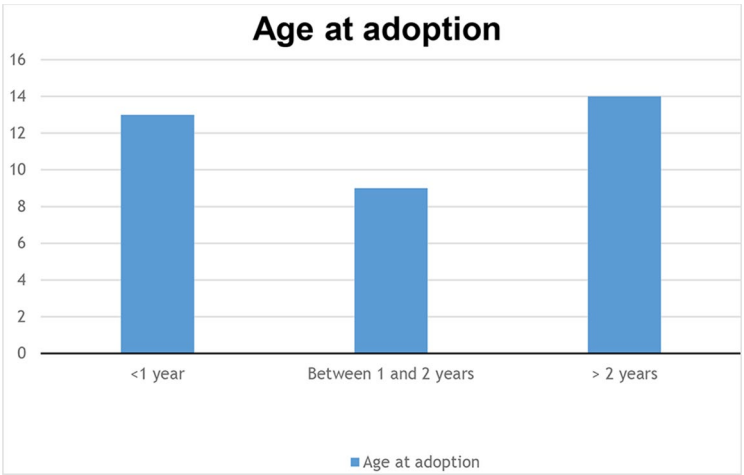

FIGURE 3 | Age at adoption.

analysis, analytic themes emerged, which were described as well as their interconnections, while preserving a link back to the original interview material. This process produced a coherent ordered table of the themes. This data analysis procedure was inductive, as the analysis of the results of international literature on this specific subject was performed in the aftermath.

To assist this analysis process, we employed a qualitative analysis data software: QSR NVivo for data management, topic extraction from, and thematic recodes of individual interview transcripts.

Validity

We compared the researchers codings, to insure the validity of our qualitative research. The three researchers involved in this study are specialized clinicians in family therapy, transcultural psychiatry, trauma, and international adoption.

Two trained researchers (AH and SS) independently coded and interpreted the parent's interviews. The emerging codes were repeatedly discussed with another research team member (MH) who had read the transcripts. These discussions permitted to identify additional themes in the data, that might not yet have been described by the codes. It enabled us to add or modify the coding in order to increase the consistency and coherence of the analysis. It was thus ensured that the themes were accurately identified and reflected the data. Through this process, systematic differences, due to variations in interpretation, were eliminated. Validity was also enhanced by distinguishing clearly between the respondents' discourse and our interpretation (25).

Ethics Statement

Parents were fully informed of the voluntary nature and the goals of the study. Written informed consent was obtained from all parents included in the study before the interview. Participants were informed that all responses would be confidential, that the transcripts would have no identifying information, and that they would be free to withdraw at any time. All identifying information was removed from the transcripts, and participant anonymity further ensured by disguising or withholding of descriptive data. Additionally, written informed consent was obtained from the participants for the publication of their indirectly identifiable data.

RESULTS

In half of the interviews conducted (n = 24), parents reported traumatic pre-adoptive experiences for their child: sudden loss of their biological mother, repeated experiences of neglect or abandonment in the biological family, emotional deprivation at the orphanage, major health problems, or serious accidents or injuries.

An interpretative and phenomenological analysis determined five themes in the interviews with the parents. Three of these themes can be sub-divided into several sub-themes (see **Table 1**).

Absence of Affects in the Narrative

The first theme identified concerned the absence of affects. Twelve parents reported pre-adoptive traumatic experiences by their child, however they did not express any emotions—whether in relation to the child's experience, or to their own.

V. lost her biological mother very suddenly. She had been living with her on the streets when one day, she got lost in an unknown city. She thus found herself in an orphanage when she was four years old. When V.'s adoptive mother mentioned her daughter's life in the orphanage, she described it as a "prison." According to her, the child's difficulty lay in adapting to this imprisonment after her "nomadic" life, without any mention of the pain, the dismay, or the despair her daughter might have experienced because of the traumatic loss of her mother.

> "She was very unhappy at the orphanage and this could very well be explained considering that as she had led a

TABLE 1 | Participants' description.

Themes extracted from the analysis	Subthemes	Number of parents interviews'
Absence of affects in the narrative		12
Denial of the significance of child's traumatic experiences	*Denial of the child's pre- adoptive past Denial of the child's health problems and suffering Difficulty, inability to talk about the child's history*	14
Perceptions of the uncanny concerning the child;	*Feelings of rejection in relation to the child Cultural devaluation*	13
Parental worry about traumatic repetition for the child		5
Specific structure of the narrative.	*Disorganisation, contradictions and fragmentation of the narrative Incoherence of the narrative The presence of silences The pervasion of the narrative by a single theme The interviewee's absorption in scenes of the past Physical symptoms The presence of undefined (stop-gap) words*.	18

nomadic life, and for a child of her age this kind of life has in a way some advantages."

A.'s biological mother died suddenly when she was one year old, which led her to be placed in an orphanage and adopted six months later. A long time after her arrival in her adoptive family, she asked where her biological mother was; her adoptive mother reported this without making any reference to her child's despair, having been faced with the incomprehensible loss of her biological mother:

"I think she's just a little girl, she was taken away from her mother and there're a lot of things she didn't understand. I think that in her mind, she was going to go back to Ethiopia. She didn't understand anything. So it was a little complicated for her. Well, it is still a little bit difficult."

B.'s adoptive mother talked about her daughter's health problems at the orphanage, without mentioning the psychological suffering that probably occurred alongside the physical pain experienced by this 5 month-old baby.

"Well, when I think about it now, at the time she arrived here, because when she arrived, she had scabies, it caused her discomfort and she kept scratching herself. She had a massive skin reaction to her anti-scabies treatment. One night she had a rash all over as if she'd been burnt all over her body, she was screaming. So I think that physically she had a lot of discomfort for a large part of her life, because she probably had scabies during the whole time at the orphanage."

These parents reported pre-adoptive traumatic experiences without mentioning any internal experiences, or minimizing their child's affects or emotions. They gave an account of this painful pre-adoptive life without expressing any affects themselves and without referring to the impact of the history on their feelings as parents.

Denial of the Significance of the Child's Traumatic Experiences

Denial of the significance of traumatic experiences in the children's pre-adoptive histories was found in the interviews of 14 parents. Parents reported different traumatic experiences—intra-familial violence and serious parental neglect in the biological family, sudden and incomprehensible separation from the biological mother, accidents, and major life-threatening health problems. They however denied the traumatic significance of these events and their impact on their children's emotional experiences and their later psycho-affective development. This theme can be divided into three sub-themes: denial of the child's pre-adoptive past, denial of the child's health problems and suffering, difficulties, or even inability to talk about the child's history.

Denial of the Child's Pre-Adoptive Past

A long time after the adoption, A. continued to ask for her biological mother—"Naté" in Swahili—who had died suddenly when A. was one year old. After having mentioned this aspect of his daughter's lifeline in factual terms, her father did not talk about it again during the interview. He focused however on relationship difficulties his daughter had regarding the adoption itself—thus shutting off her previous life. His answer to the question about difficult times experienced by his daughter in her life was hesitant, it was interrupted with silences and changes of subject. It showed his reluctance to talk about this subject and highlighted the father's inner conflict to neutralize any significant traumatic impact on his daughter.

"(Silence)… The adoption. The trip. Well, the adoption… (pause), the move here, her friends. At the same time, she's quite curious. She's quite … I would say that it's really about the adoption."

When C.'s father was interviewed about events that led his daughter to be adopted, he exclusively mentioned her own wish to be adopted.

"Well, what made her decide, well, first it was … in fact they asked her if she wanted to, and so, I think she saw, er, psychiatrists or psychologists to see if she wanted to, if she really wished (…) to be adopted (…) So she was completely aware … so."

Reasons which let C. to be removed from her biological family, to be placed in an orphanage and to be adopted, such as experiences of ill treatment by her biological family, seemed to be repressed. Instead, his narrative placed C. as the instigator of her own adoption, thus denying the trauma endured as a subconscious way to be both protected from the disrupting traumatic impact.

H.'s adoptive mother on the other hand considered that her daughter's abandonment and adoption were her own initiative and desire. When questioned on the reasons why H. was abandoned, she gave the following answer:

> "Yes, because once adopted … It was me who adopted her, so…"

She talked only about her own family and transgenerational history to give meaning to her daughter's adoption, without mentioning the child's painful pre-adoptive past in any way. Focusing on her own lifeline is indicative of the denial process which targets the traumatic impact of the daughter's past, which was suppressed from the narrative.

Denying the importance of a child's pre-adoptive past is thus a way of denying the significance of the traumatic experience itself. This denial was again unfolded by the obliteration of any memories relating to the trauma—in this case extreme parental neglect leading to the removal of the child from parental authority.

> "I think that his … his memories, they don't go beyond … the orphanage, so his first memories are linked to the orphanage." (L.'s mother)

Denial of the Child's Health Problems and Suffering

Denial of the significance of the child's traumatic experiences was linked to a sub-theme concerning the child's health problems and suffering.

When she was a child, V. had two serious illnesses, probably linked to her very precarious life conditions in the streets with her biological mother, whom she later lost. When she was adopted, doctors realized that she had already developed pneumonia in the past, with somatic after-effects, as well as hepatitis B.

> "We found out that she had also contracted hepatitis B, but apparently she got rid of it, I mean, she's developed antibodies. But we don't know how she caught it. Anyway, she didn't need to be vaccinated and that's a very good thing."

Without referring to her daughter's subjective experience when she was ill, her adoptive mother only underlined the positive aspect: V. did not need to be vaccinated. The deployment of defense mechanisms as minimization or even reversal of meaning—"that's a very good thing"—of her daughter's health problems, can be understood as an attempt to deny their impact on the child and the meaning they carry: the evidence and consequence of her earlier hostile, difficult life conditions. The adoptive mother concluded with a statement that went against what she had reported earlier: "she hasn't had any serious problems."

Similar statements were made by F.'s mother when she was asked about her daughter's potential health problems.

> "No … Well F. is a little girl who was burnt, she was seriously burnt. She fell into boiling water when she was little, so she … she was in hospital a long time, she had skin grafts. There are burns on her body … I can't remember. I think it's 60% of her body, so there we are. Otherwise, she's a child with no major health problems."

The traumatic experience of having fallen "into boiling water" when she was not even two, which seriously burned a large part of her body, requiring many skin graft operations, was totally minimized by the mother—"no major health problems." This could be interpreted as an attempt to annul the unbearable trauma experienced by her daughter, whose body was an ever-present reminder.

Difficulty, Inability to Talk About the Child's History

Certain parents only mentioned their child's pre-adoptive past with a repression of affects or comments, despite the fact that this past was really frightening, even shattering.

> "So I don't know, it's probably someone who attacked her, well, with a machete or goodness knows what, she had a hole here, behind her head, a hole, not in her skull but on her hair' (I.'s mother)

This extremely violent experience suddenly emerged from this mother's account, with its potentially dazing impact, but she did not go back to the subject and was unable to speak about it any further.

Other parents did not wish to talk about their child's pre-adoptive traumatic past. F.'s father talked about his daughter's pre-adoptive past in these terms:

> "The Lithuanian files had been well compiled so we were informed of events with her family and we were aware of her health problems, in particular because she had been so seriously burnt."

When the interviewer repeated the question, he refused to talk any further: "No, I think that answers your questionnaire."

This was the case with B.'s mother who wished to leave her daughter "the primacy of her history." However, she felt "stressed" by the professionals who were questioning her about the past. They were worried for B., especially on account of alarming diagnoses they had made on her arrival in her adoptive family. It was thus through the professionals' reaction to her daughter's history that the mother felt alarmed. Fears linked to her daughter's past were kept silent. But that past was experienced and recognized as such, through the eyes of professionals on her daughter.

B.'s father expressed his refusal to talk about his daughter's pre-adoptive past even more clearly.

> "She was er, (silence), so (silence), the circumstances in which she was abandoned, well, considered as abandoned (silence) and as for the remaining circumstances, er, we don't tell anyone."

Refusing to talk about the child's painful or traumatic past can be seen as a painful attempt to occult its existence and impact.

Perceptions of the Uncanny Concerning the Child

Perceptions of "the uncanny" emerged from many interviews (n = 13) on the part of the parents toward their child. Furthermore, this emerging theme could be linked to two sub-themes: rejection and resorting cultural devaluation.

When A.'s mother mentioned the anxiety and distress expressed by her daughter, she underlined their "sordid" nature. This term reflects the uncanny element felt by the mother in this context, which made physical contact between the two difficult in moments of affection.

> "Even now, when she wants a cuddle, it's always extremely clumsy. As for me, in front of her, I'm also clumsy. Contact is difficult … In fact, when she needs physical contact, I have to reason myself and tell myself: relax, let her come to you."

D. suffered from severe malnutrition in infancy. According to his father, he was only "saved" once he got to the orphanage. The relationship with food that he later developed was seen as the consequence by his adoptive father, which greatly worried him.

> "The minute it's in his plate, he's like an animal, really, a wounded animal, and that's worrying, for me, it's something that worries me, his impulsive side, but it's not impulsive, it's irrational, and I'm worried about it, it scares me, and then, with adolescence, how far can it go at that age? (…) It's almost like bestiality, it's really … very basic instinct."

The use of this term "bestiality" perfectly illustrates the perception of the uncanny experienced by the father concerning his son. Because of his malnutrition experience, D. was seen as a « wounded animal » whenever he had food in front of him, which removed him from the human community. Parental expressions comparing their children to animals or things or mysterious objects were found in many of the interviews.

> "He's like a wild cat who has set up strategies … of defense. I mean, it doesn't take much for him to show his claws" (T.'s mother)
>
> "F.… er … when we first met her, she was … She was like a pot of flowers (…) I mean, she was a little girl who did not take part in anything and was an outsider to everything." (F.'s mother)
>
> "But with the international adoption scheme, when I brought my daughter back with me, she was a sort of UFO" (V.'s mother)

This perception of the uncanny toward their children was seen as worrying.

> "It worries me" (C.'s father)

In accounts from other parents, it was the country of origin and its culture that crystalized this perception of the uncanny: a "mysterious" and unfamiliar country (I.'s mother), an "overdosing" country (T.'s mother) and a world like a "concentration camp" (M.'s mother).

Feelings of Rejection in Relation to the Child

This perception of the uncanny in the child was not only felt as worrying, it could even lead to the child's rejection by the parents.

> "I think that since he's been here, the word that sums it up is it's really difficult. Difficult with the family, difficult in his relationships with his sisters, difficult with us, difficult at school and difficult in his relationships with his friends, so there we are (…) it's true that he shows up the bad side of adoption (…) Well, we are sick and tired, so it's true, sometimes we say things that go beyond our thoughts, but we're really fed up" (R.'s mother)
>
> "I actually hate him! I can tell you this and shock you, so what" (T.'s mother)

Parents also experienced rejection by their children.

> "We are not very close affectively (…) I don't know whether I'm essential in her life. I don't feel she needs me." (I.'s father)
>
> "She really rejected me at first. Really, really, really rejected me (…). Well, I mean, she was only very little. But it was really painful" (A.'s mother)

A.'s mother was not able to link this reaction to her daughter's recent pre-adoptive experiences: her biological mother's sudden, unexplained death, and the fact that she asked after her for a long time. The adoptive mother only talked about her own internal experience and the pain she felt at this rejection. In this context, she mentioned the need "to protect herself" from this painful feeling.

Cultural Devaluation

A second sub-theme linked to perceptions of the uncanny discussed previously concerns what El Husseini et al. (26) referred to in their studies as cultural devaluation.

T.'s mother linked her son's traumatic past—an infant who had repeatedly been left alone for several days by his alcoholic parents—to what she called the "Slavic culture."

"There's a lot of alcohol and violence over there … So kind words, things like that … It's not in their culture. There it is."

This child's experience of extreme distress, abandoned, alone and without food, was confused with his cultural origins. Her son's unbearable experience was attributed to his culture of origin—the "Slavic culture," violent, unloving, alcoholic.

The impact of the trauma on the mother pervaded her whole implicit perceptions of the country of birth and the child's attachment to his origins, familial as well as cultural. In this context, the mother expressed her incomprehension, even her non-recognition of the need expressed by her son to have links with his biological mother, and her surprise at her son's difficulty in "losing" his mother tongue.

Before she was five years old, F. underwent several skin graft operations following her serious, extensive burns, which meant that she had to be isolated a lot. The mother's confrontation with this pre-adoptive history and with her daughter's badly marked, mutilated body following these traumatic experiences established links with the culture of her daughter's country of birth.

"There's the individual history, there's also the history of … that country. So we went to orphanages (…) well, I saw some real harridans, some Belarusians that were there, and they were like prison wardens (…). I tend to put everything in one bag, but it's true, there are things that can't be forgotten. We can't forget (…) it's not just her personal history, there's also this country's history, where people talk loudly, and hit out easily. I think that's part of it."

What this girl had to live through physically and psychologically was, because of its violence, unthinkable for the woman who became her mother. The unbearable nature of her daughter's traumatic experience undermined the mother's ability to elaborate—"(…) but it's true, there are things that can't be forgotten. We can't forget." Being unable to give meaning to the situation, she looked for it in the culture of origin where these traumatic events took place—"the country's history," full of "prison wardens," noisy and violent.

Parental Worry About Traumatic Repetition for the Child

In a few parental interviews (n = 5), parental worries were found with regard to the potential recurrence of the trauma in their children. The significance of certain current experiences was interpreted in the light of the child's pre-adoptive experience.

C.'s father was very worried during prolonged separations from his daughter, leading him to set up protective strategies in case of emergency: "I was more worried in the beginning (…). But as parents, we get more worried when we send her to a summer camp, it reminds her of the orphanage, especially in Poland. So we were anxious for everything to go smoothly. At least (…), at least, my wife wasn't far away. She was in Poland, staying with her brother, about 100 km away, she could go and get her. At least we had this safety net."

L.'s father associated his son's recent racketing experiences at school with the feeling of painful abandonment he had experienced before his adoption: "He knows he was abandoned, I think he suffered at not having a mother at the orphanage, because the other children, three quarters of the other children had been placed there, but the parents in fact came at the weekend or once a month, I think that he suffered a lot, L., the youngest boy, not having anybody."

T.'s mother understood her son's violent behavior as a recurrence of the "violent past of the family."

N.'s mother interpreted any feeling of rejection experienced by her son in his relationships with others as an endless repetition of his biological mother's initial abandonment. When she felt that her son was "lost" or distressed, she would "(take out) his little hat," knitted by his biological mother or a photo of her. Similarly, she associated his "somatic symptoms"—stomach ache, pain in his feet—with the malnutrition he had suffered during the first three weeks of his life: "yes, he does have somatic symptoms (…) but it could well be linked to undernourishment, couldn't it? When I had him, he was undernourished."

F.'s mother wondered about her daughter's future pregnancies because of the lack of love and the many rejections she had experienced on the part of her biological mother and father, but also because of how she saw her body, bearing the marks of serious injuries.

Specific Structure of the Narrative

We explored the structure of the parents' narrative when they started talking about their child's pre-adoptive life, what they knew about the abandonment and the child's personal history before the adoption. An analysis of the narrative structure showed specific and recurrent characteristics with the same narrative format in many of the interviews (n = 18). These specificities are as follows: disorganization, contradictions, and fragmentation of the narrative; incoherence of the narrative; the presence of silences; the pervasion of the narrative by a single theme; the interviewee's absorption in scenes of the past; physical symptoms; the presence of undefined (stop-gap) words.

Disorganization, Contradictions, and Fragmentation of the Narrative

Disorganization and fragmentation of the narrative was found in 12 interviews with the parents. This can be defined by loss of the train of thought, incomplete and interrupted sentences, and contradictory and broken narratives.

"Yes, I think there's a date she talked about, the day she … She remembers when she arrived at the orphanage. It was traumatic. From what I understood, she arrived there with the police, etc. I think that when she realized she had been abandoned, it's something that … One thing she's talked to us about is the day she … Apparently, her mother…" (C.'s father)

"I think so, yes, all these periods when she was alone, in fact, when she was crying. I also think … For the others, we had a few clues written on paper, for her we have nothing … So, because of that, maybe we tend too much to think that it's been harder for O., even without … well, subconsciously" (O.'s mother)

Sometimes the parents' accounts were incoherent and difficult to follow.

Concerning the issue of losing his mother tongue, T.'s mother lost the thread of her narrative: she went back to the process of adoption itself, their difficult experiences, her time off work, the return to work, before asking herself 'Why am I telling you all this? I wanted to fall back on my feet by telling you all this and there we are."

On many occasions during the interview, F.'s mother forgot the question that had been asked before, carried away by her story and the intensity of the feelings and affects described, particularly when she recounted her daughter's painful past: "Er … for, er … for, er, F.… what was the question again (laughs)?…"

When V.'s mother was asked to describe her daughter, she lost her train of thought and could not remember what she had said: "So, what did I first tell you? I've already forgotten! (…) And what did I say last? I've forgotten. Ah, yes, I said a … No, what did I say? I can't remember what I said." Alongside, in her narratives there were numerous digressions and details, in a continuous flow of words about her daughter's problems, which at the same time she minimized.

This disorganization, contradictions, and fragmentation of the narrative was only observed, when the parents talked about their child's pre-adoptive life.

Incoherence in the Narrative

Incoherence in the narrative is defined by a discrepancy between semantic memory and episodic memory (27). It was found in four parents' accounts.

L.'s father explicitly said that he only had "very little" information concerning the conditions of his son's abandonment. However, he described them in a very precise way "When he arrived at the orphanage, he was undernourished, he had not been very well looked after … I understand that the mother had been away for a few days. It was the police who took them there in emergency, er … at two and a half years, he wasn't talking … only a few words."

C.'s mother started to recount her daughter's pre-adoptive life by saying that she "knew nothing about her child before she was adopted." However, she gave a lot of information: "Er … so er … we know that … that she was … brought to the orphanage by the police when she was 5… er … and it's probably the neighbors who alerted the police, telling them that there were two children in the flat … in the building and … and I think it was winter and in the flat there was no heating, there was no light or there was probably nothing to eat and … two dirty children, alone, who were probably crying and there we are … and … so er … I think it's the neighbors who called the police and the police brought them to the orphanage to be placed."

When F. 's mother talked about her daughter's health problems, she reported serious burns requiring many skin graft operations. She then concluded in this way: "Otherwise, she's a child with … with no major health problems."

This observed incoherence in the narrative was restricted to the parental accounts of their child's pre-adoptive experiences. When other aspects of the child's life, his relations with his parents, the choice of country were addressed, the parental narratives were coherent.

The Presence of Silences

The narratives of three parents were introduced and punctuated by many silences.

> "She was er, (silence), so (silence), the circumstances in which she was, well, abandoned, well, considered as abandoned (silence)… and as for the remaining circumstances, er, we don't talk about it to anyone." (B.'s father)
>
> "(Sigh, silence) well, he doesn't ask anymore, er, (silence), what questions did he ask? Er, why his mother died; she must have been poor, she was ill, so his grandmother, she looked after him." (D.'s father)
>
> "(silence)… The adoption. The trip. Well, the adoption. (silence) the move to this place, her friends. At the same time, she's quite curious. She's quite … I would say that it's really about the adoption." (A.'s father)

Pervasion of the Narrative by a Single Theme

Long descriptions with no link to the rest of the narrative were found in several parents' accounts (n = 5). Their narratives were thus pervaded by a single theme.

When C.'s pre-adoption life was mentioned, her mother deflected from her daughter's personal experiences and gave an extended presentation of the types of children's institutions that existed in Poland.

When talking about his daughter's medical history, in particular scabies, which she had contracted, B.'s father suddenly gave a long account of the geography of Ethiopia:

> "'(…) and er, on top of everything, she had skin complaints, she had scabies so she was constantly scratching herself, anyway there was a lot of discomfort etc. so for us, she was a little girl, so it was, er, beautiful, really, and the country is … beautiful, there's a lot of contrasts, because it's like walking in Normandy, there are Normandy temperatures on Ethiopia's high plateaus, it's green just like in Normandy, and there's so much poverty, there's a lot of contrasts, there are no old people in Ethiopia, there's a lot of people in the streets, they're all young, the old people are all dead … Or anyway, they never come out."

After having described the natural beauty of the country, it was the theme of death that suddenly emerged in his account.

Absorption in Scenes of the Past

When they talked about meeting their child at the time of adoption, four parents seemed absorbed in memories from the past.

C.'s father was absorbed in sensory memories "I stayed in the car with her for 1 h, trying to explain: "come with me." She took hold of my hand, she clawed it with her nails and then "you're hurting me, but it doesn't matter."

M.'s mother reported some shocking images at the time of the adoption:

> "We saw him, in big beds with bars this high, what do you call them, you know those white clothes for mad people, you know, the way we strap babies, straitjackets, he was in this kind of garment, you couldn't see his hands, a large white garment buttoned up on the outside."

Physical Symptoms

Physical symptoms were found in three parents interviewed, showing the intensity of the concomitant psychological processes. C.'s father laughed several times in inappropriate manner during his account, especially when he described painful events experienced by his children and their repercussions. L.'s father coughed a number of times when he talked about the conditions of his son's abandonment.

The Presence of Undefined (Stop-Gap) Words

The use of undefined or stop-gap words, showing a lack of words and representations to describe the child's experiences, was found in two parents' accounts.

> "Er … When we took him to see the psychologist, this thing he had a problem with, it was hard for him to tell us (…) We didn't pay that much attention to the fact that he had a funny kind of behavior, that he would wake up at night, he would get irritated, he was … whatever … and then it was the holidays (…). (L.) talks about the adoption … He knows that thingy…" (L.'s father)

When A.'s mother mentioned the anxiety expressed by her daughter, she lacked words: "So, if she, herself, had no more legs, no more thingy, what…? Anyway, there're only things like that … it's a bit sordid."

DISCUSSION

Five themes emerged from the IPA analysis of the interviews: absence of affects in the narrative; denial of the significance of the child's traumatic experiences; perceptions of the uncanny concerning the child; parental worry about traumatic repetition for the child; specific structure of the narrative.

These themes reflect the parents' personal experiences of their children's pre-adoptive past. They raise the issue of the traumatogenic impact of these traumatic experiences on them and their repercussions on the child's parental representations. They could be interpreted as the transmission of trauma from the children to their parents (28).

When they mentioned potentially traumatic events experienced by their children before their adoption, half of the parents showed (12/24) a disruption in their affective function—none on the subject of the child and none for their own account. They hardly ever referred to their child's internal personal experience. Some parents denied the impact of the pre-adoptive past on their child's affective and emotional experiences, minimizing it or repressing it. When the traumatic events concerned health problems linked to hostile life conditions, these problems tended to be minimized. This denial of a painful, traumatic past could reflect an attempt to cancel, to erase in hindsight, its existence, and the impact on their child. Several studies have shown that the mechanisms of denial and minimization of hostile experiences are criterions found in the narratives of traumatized subjects (29, 30), highlighting the traumatogenic impact of these experiences on the parents.

This absence of affect in the parents' accounts and the denial of the significance of their child's traumatic personal experience shows poor reflective function on the part of the parents. The reflective function as defined by Fonagy (31) is the ability of the parents to picture their child's affective and internal personal experience, to let themselves be affected and to adjust to it, in order to mentalize it. The parents' mentalization capacity helps the child identify with a meaning to its own disrupting experiences and thus integrate it in their storyline and their world experience. This process alleviates the traumatic impact on the child in its affective development. This internal/psychological dimension, either silenced or canceled, shows parents' specific difficulties in identifying themselves with their children when their pre-adoptive past is mentioned. This inability to identify themselves—restricted to a given period—can be interpreted as a way to distance themselves from the unbearable, the unthinkable in their child's traumatic personal experience. On the other hand, when other difficult moments in their child's life were mentioned, events that took place after their child's adoption, the parents were quite capable of talking about their child's and their own personal affective experience, thus showing a good reflective function. This observation supports the understanding that the absence of reference to internal and emotional personal experiences is a form of defensive reaction to the child's traumatic personal experience. Temporarily, they find themselves incapable of identifying with their children or of putting themselves in their place. This sudden and temporary interruption in their reflective function is a sign of trauma. The results concerning the reflective function seem all the more important, as other research have highlighted its significance as a predictive factor of the child's outcomes, especially for maltreated adoptees (18, 32). A high reflective function enables the parents to identify with their children, preserving them from a feeling of intense otherness and strangeness.

This adoptee's position of otherness was precisely found in our results. We postulate that the parental experience of the child's strangeness and otherness depicts their reaction to the pre-adoption trauma. The terms used by the parents to describe their child expressed a certain dehumanization of their child. The parents' narratives provides insight into what cannot be thought or elaborated by the parents. The impossibility of representing what the children have lived through could exclude these children from the human community, thus hindering any identification process for the parents. The child takes on an unsurpassable otherness. This otherness has already been described in studies on children's skin color (33) or on their

foreign genetic heritage (34, 35). The present results add another dimension to the child's otherness, related to the impossible representation of his pre-adoptive experiences. The adoptees holding this trauma through scars on their bodies or through the narratives of their parents could be stranded between two filiations and doomed to wander between affiliations: they have been uprooted from their past world and the rooting process in their present is impeded by the trauma's radioactivity (36) on the parental representations of the child. They face difficulties to be identified as same by their biological family and their birth culture as well as by their adoptive family and their new host culture.

The uncanny (37) generates dread within the parents psyche and triggers defense mechanisms. Negotiating the dread can result into distancing oneself and rejecting the source of the dread, that is the traumatic residue lodged in the child. This process is echoed in the poor reflective function. Some parents attribute their children's traumatic experiences to fantasized characteristics of the country of birth, which could be interpreted as an attempt to give their children's personal experience meaning, to give it a place. The difficulty facing trauma results in disregarding cultural interpretations and resorting to generalizations in order to make sense of an utterly painful situation. It also provides a protective distance with the person's culture of origin (26). The parents' accounts show how they are confronted with trauma that cannot be remembered/elaborated. The culture of origin allows them to fill the void of representation. It is the culture of origin, which is foreign and strange, that explains the violence experienced by the children. The trauma is attributed to the culture of origin. Thus, parents are confronted with a double-layered otherness—the otherness of the trauma and the otherness of the culture of birth. This undermines their ability to identify and empathize with their child, who is kept at a distance because of this overwhelming otherness.

Some accounts were characterized by a disorganization, even fragmentation of the narrative, which was contradictory, incoherent, pervaded by a single theme and punctuated by silences or physical symptoms, such as laughing or coughing. The use of stop-gap words and excessive focus on scenes of the past complete the description of the narrative structure. We consider that the parents thus exhibited traces of unresolved parental trauma, as described in the Adult Attachment Interview (27). Hess et al. (38) found evidence of narrative disorganization in their study on the structure of narratives concerning loss or trauma using the Adult Attachment Interview. These findings show a non-metabolization of traumatic events. Disorganization and incoherence in the narrative are only present when the traumatic events are mentioned: the same respondent can give a perfectly coherent account when mentioning other aspects of the history (39).

The present results, showing the traumatogenic impact of children's pre-adoptive traumatic experience on their parents and on the parents' representations of their children, can be interpreted on the basis of concepts developed by Wilson et al. (40). These authors suggested two types of counter-transference reactions to a traumatic narrative. Although this model was developed from a therapist's reaction to his patient's narratives, it seems interesting in the exploration of parents' reactions to what is transferred to them—by the children themselves or by others—of their child's pre-adoptive experience. The first type of counter-transference is characterized by avoidance and the second by over-identification. Our results point to an over-representation of the first type in the interviews. The empathic strain experienced triggers empathic repression (40). These types of reactions to a traumatic account include forms of denial, trivialization, distortion, avoidance, detachment, and withdrawal toward the subject, and these are reactions that were highlighted in our interviews with the parents.

The themes that emerged from the interview analyses showed some evidence of transmission of trauma among adopting parents confronted with their child's pre-adoptive traumatic experiences. This finding is confirmed by other studies carried out on the subject, underlining traumatic effects among parents as a consequence of their confrontation with their children's trauma (19) and symptoms of depression, stress, or anxiety they may develop (20).

The analyses presented are, however, limited by the small number of fathers interviewed, in comparison to the mothers. A second limitation, frequent in qualitative research, concerns the difference between parents who volunteered in this study and those who declined. Maybe our participants encounter more difficulties in their parenting process in relation to their child's pre-adoptive past and volunteered in our research in order to gain understanding of their internal processes.

The present results underline the need for specific therapeutic support for adopting parents, and even more the need for a support program for these parents in their adoption procedure. This support would enable better parental preparation to welcome a child who has lived through pre-adoptive traumatic events. This is all the more true because children are being adopted at increasingly later ages, thus increasing their risk of previous confrontation with hostile environments or traumatic life events. In a previous study, we showed an increased risk for traumatic experiences for parents, when they first encounter their child (41). A pre-adoption program addressed to the parents could make them aware of the reactions and needs of traumatized children, and also of the challenges faced by those who take care of them, in particular the families. Some authors (42–44) have highlighted the need for parental preparation, in order to prepare them to be parents and also therapists for their child. Many studies have in the last few years underlined the usefulness of specific training on trauma for parents—both for welcoming the child (15, 43, 45–47) and for coping with the risk of trauma transmission (16, 19, 20, 48).

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

This study, involving human participants, was reviewed and approved by the Comité d'Evaluation de l'Ethique des projets de Recherche Biomédicale (CEERB) du Groupe Hospitalo-universitaire Nord, on the 29th of March, 2011 (Institutional Review Board N° IRB00006477). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

SS and AH conducted the research under the supervision of MH. The order of appearance on the manuscript: SS, AH, MH.

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METHODS
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Using a Mixed-Methods Approach to Analyze Traumatic Experiences and Factors of Vulnerability Among Adolescent Victims of Bullying

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A number of studies have analyzed the bullying phenomenon among adolescent victims. Relatively few studies, however, have specifically addressed the associated post-traumatic stress disorder (PTSD). Our clinical practice and therapeutic encounters with adolescents reveal that the majority of bullied adolescents suffer from high levels of PTSD. The objective of this study is to further explore bullied adolescents' traumatic experiences. In an attempt to analyze these experiences, this article presents a mixed-methods approach. Such an approach will allow to analyze the PTSD that results from bullying as well as subjects' psychic and family-relevant vulnerabilities. First, bullying will be defined in the context of adolescence. Then the main studies on bullying will be presented. The objectives, tools and methods of analysis will be presented. The interviews will be analyzed according to the Interpretative Phenomenological Analysis (IPA) method. Projective tools, family drawings, Rorschach and Thematic Apperception Test (TAT), will be analyzed using a psychoanalytic interpretation method. Each qualitative tool will be used alongside a validated quantitative tool. The Clinical Administered PTSD Scale (CAPS-CA-5 questionnaire) and the interviews conducted will thus allow to analyze PTSD and traumatic experiences. The Family Assessment Device (FAD) and the family drawing test will enable to assess family functioning; lastly, the Symptom Check List (SCL-90) that will be used alongside Rorschach and TAT tests will allow to analyze individual psychological vulnerabilities. This approach will increase data validity. The originality of this research study is based on a mixed-methods approach, our methodology which is based on clinical psychology, and the choice of certain research tools which have received little attention to date. Ultimately, this study may help improve how bullying is identified and could contribute toward the reinforcement or revision of the criteria that characterize bullying. Lastly, it may help us explore various unexamined dimensions of bullying. A possible limitation is the complexity associated with such a protocol.

Keywords: bullying, adolescence, mixed-method approach, projective tests, quantitative tool, clinical interview

INTRODUCTION

Numerous studies have analyzed the issue of bullying among adolescent victims. Relatively few studies, however, have focused specifically on the associated post-traumatic stress disorder (PTSD). Our clinical practice and therapeutic encounters with adolescents reveal that the majority of bullied adolescents suffer from high levels of PTSD. We have thus decided to further explore bullied adolescents' traumatic experiences. This article presents a mixed-methods approach only recently developed. This approach will allow to analyze the PTSD that results from bullying. It will allow also to better understand subjects' psychic and family-relevant risk factors. Where family factors are coupled with psychic risk factors, a special convergence (1) may arise, making adolescents more vulnerable to bullying and trauma.

Defining Bullying

Bullying is a complex global phenomenon (2). Between 100 and 600 million adolescents around the world are supposedly concerned. Over the past 20 years, a considerable number of studies have focused on this phenomenon. Indeed, publications on the issue, written primarily in Spanish and English (3) tripled between 1980 and 2007 (4). Despite clinical psychologists' and researchers' keen interest in the subject, the phenomenon remains hard to fathom. Moreover, there is still no consensus on its precise meaning.

Most of the available studies have drawn on Olweus' (5) definition of school bullying, which is worth quoting at length:

"a negative action when someone intentionally inflicts injury or discomfort upon another, basically what is implied in the definition of aggressive behavior. Negative actions can be carried out by physical contact, by words, or in other ways, such as making faces or mean gestures, and intentional exclusion from a group. In order to use the term bullying, there should also be an imbalance in strength (an asymmetric power relationship): the student who is exposed to the negative actions has difficulty defending him-/herself and is somewhat helpless against the student or students who harass. (…) The phenomenon of bullying is thus characterized by the following criteria: it is aggressive behavior or intentional 'harm doing', which is carried out repeatedly and over time in an interpersonal relationship characterized by an imbalance of power" (5, pp. 8–9).

This definition, which covers most of the important characteristics of bullying, seems fairly comprehensive. Thus the Olweus' definition will be chosen for the present study.

Some authors have described different types of bullying: direct, indirect and cyber bullying (6; see Table p. 880).

1. Direct bullying. This type of bullying is more common among boys. It includes physical and verbal attacks.
2. Indirect bullying. This type of bullying is more common among girls and more hidden. It includes gossiping, spreading rumors, social exclusion or even the deterioration of the victim's objects.
3. Cyber bullying. For Patchin and Hinduja (7), cyber bullying is voluntary and repeated harm inflicted through the use of technologies. Using technologies, bullies can extend the reach of their intimidation and their grip beyond the "usual" space where bullying takes place (often in school). This type of harassment includes obscene or insulting messages sent by telephone or computers, rumors spread on the internet or even sites created specifically to humiliate the person (use or dissemination of compromising photos or videos). Because of the anonymity promoted by technologies, these bullies have some form of power.

In addition to the elements of the Olweus' (8) definition (frequency, intensity, repetition, duration, power of imbalance), the specificities of adolescence should be considered. In a previous work (9) two essential dimensions have been highlighted, i.e., the psychic processes associated with puberty, and the significant role played by the peer group.

To develop our methodology, we will focus on these two dimensions which we deemed relevant.

Adolescence and Bullying

According to Volk et al. (10), bullying is at its "maximum level" when it occurs in adolescence. Adolescence is a particularly sensitive period. It is conductive to the reactivation of the vulnerabilities experienced in childhood and the emergence of anxieties, mainly because of sexual maturation (11–15). Some authors speak of a specific adaptive strategy during this period (16–18) which allows the development of romantic relationships (19) and enables some adolescents to distance themselves from sexuality (20). Sometimes, sexuality during adolescence induces anxiety. Moreover, the quest for autonomy in adolescence requires a sense of internal security. This enables them to cope with separation and its accompanying emotions. Nevertheless, the separation process may destabilize the already precarious equilibrium of some vulnerable adolescents (9).

The significant role played by peer groups in adolescence sheds further light on bullying (21, 22). Renshaw, Roberson and Hammons (23) analysed the roles different protagonists play: "ringleaders", who start the bullying; "followers", i.e. those who participate in the bullying; "supporters", who encourage the bully or make fun of the victim; "defenders", who come to the help of the victim; "witnesses", who passively watch without intervening, especially in the school setting (24, 25); "victims", and lastly, the "neutral".

Indeed, peer groups are perceived as providing support (26, 27) and play a major role in adolescents' identity construction (28). The group may represent a secure space and provide the narcissistic value associated with adolescence (29). Nevertheless, it may also be a source of danger for the most vulnerable adolescents. The group acts as the guarantor of the very existence of some adolescents (30) as it is perceived as a space for protection, valuation, and socialisation. A number of studies have repeatedly highlighted the paradox of the peer group. As a matter of fact, the group can be used as a weapon in the service of bullying but also as a resource to allow the young to overcome bullying (31–33).

Anzieu and Martin (34) call attention to the fact that the group may have a deleterious effect on the personality of a member, in terms of his or her integrity, freedom and independence. The group is formed through the fusion of its members. Through this process a collective identity is created. It is often led by a leader who guides and secures its members who risk losing all critical and personal judgment. Regularly, a scapegoat (35) is designated based on his or her 'scapegoat features', i.e., any differences from the group

(infirmity, physical or social difference, disability, ethnic origin) as well as 'extreme' qualities (wealth or poverty, beauty or ugliness, vice or virtue, strength or weakness) which awaken hatred, desire, or covetousness (36). It is thus easy to understand, in the context of bullying, the extent to which the group has a significant impact on subjects (37). Indeed, for adolescents, the peer group and the group processes, supports the identity construction.

Family and Psychological Risk Factors in Adolescent Victims

It is worth mentioning that these two aspects alone (adolescence and the peer group) do not explain the phenomenon. Other factors must be taken into account. Other possible dimensions will thus be highlighted in order to better understand why some adolescents are targeted. Most authors agree that victims of bullying do not fall within a specific personality or profile (38). Nevertheless, specific adolescents are targeted, as bullying depends on certain factors that may increase the emergence of this process and encourage its expression and establishment.

Relatively few studies have focused on family risk factors. These studies underscore that the economic and social conditions of the family (39), intra-family violence (40), intrafamilial sexual abuse (41) and family equilibrium disruption may precede bullying (42). Moreover, the mental health of parents (43, 44), parenting styles, and the quality of the attachment between adolescents and their parents (42, 45) have also been identified as risk factors (46). Overprotection and poor identification with parents affects the degree of victimization by peers (5, 47, 48). For Finnegan et al. (49) victimization is associated with perceived maternal overprotection for boys and with perceived maternal rejection for girls. Victimization has been also associated with greater parental involvement in school, which may reflect parental awareness of children's difficulties but which may also reflect a reduced independence among these youths (50, 51). In a recent study (52), the researchers demonstrate that the parental bonding quality (care, indifference, overprotection and encouragement of autonomy) is related with children's bullying/victimization experiences and post-traumatic symptomatology.

Despite the significance of the factors cited above, the general consensus among researchers is that individual psychological risk factors play a great role. More studies have found that bullied youth have more psychotic personality (53, 54) or display more neurotic traits (i.e., they suffer from emotional instability) (55–56) compared to the general population. Moreover they are more extroverts (45).

A recent randomized study conducted in Greece (52) sought a statistical analysis of the relationship between the symptomatology of PTSD and the role of parental bonding in the victimization process (as a risk factor and as a protection factor). The researchers used the the Greek version of the revised Olweus Bully/victim Questionnaire and the Children's Report of post traumatic symptoms. They examined how traumatic symptom levels (depression, somatization, avoidance behavior, dissociation) are associated with parental bonding type, in the context of bullying type, and how bullying behavior roles are shaped. They analyzed a specific model that emphasizes how certain types of parental bonding can cause certain emotional reactions in relation to bullying and traumatic symptoms.

Bullying and Negative Psychological Effects in Adolescent Victims

Exposure to bullying is a significant risk factor that contributes independently to the emergence of psychological difficulties and pathology, regardless of pre-existing mental health symptomatology, genetic predisposition, or family psychosocial difficulties (57).

According to Bhui et al. (58) adolescents who have been victims of bullying show signs of significant psychological distress and social integration difficulties. They also suffer from more psychosomatic disorders (59) and more psychopathologies than the normal population (60). The victims present also other psychological difficulties (61), such as sleep disorders (62), depressive symptoms (27), and anxiety (the most common is social phobia (63). In addition to this, they are much more prone to self-harm (Mahon Mc et al., (64, 65); suicidal ideation, or suicide attempts (67).

They also have symptoms of post-traumatic stress resulting from the bullying (9, 67–70). Kaess (68) argues that bullying should be viewed as any other form of violence. This view is shared by other studies (67, 69) which have found a high level of PTSD in victims using the Life Event Checklist. Moreover, the studies have found that in some cases the consequences of adolescent bullying are more serious than those faced by victims of serious abuse or neglect (68, 71). In a previous qualitative study (9) the symptoms of trauma (negative effects of trauma) that are still present even one-and-a-half years after the bullying event, have been identified. In addition to this, drawing on a case study (Alexandra, 16 years old) and using interviews and thematic analysis, the adolescent's subjective traumatic experience could be explored.

RESEARCH OBJECTIVES

Following our literature review on bullying and drawing on our clinical practice, two main objectives were defined.

The first objective is to explore the family and individual risk factors associated with adolescent victims of bullying.

The second objective is to explore the PTSD symptoms linked to bullying.

In order to explore the above mentioned dimensions, a clinical assessment protocol combining qualitative and quantitative tools will be applied.

METHODOLOGICAL AND EPISTEMOLOGICAL CONSIDERATIONS

Given the predominance of quantitative studies, a purely qualitative approach may have been privileged as in the study undertaken by (72) (one of the few studies that have used this approach to analyze bullying). However, like Guerra et al. (73), we believe that combining quantitative and qualitative approaches may make it

possible to benefit from the richness of the qualitative method while maintaining the rigor of the quantitative method. Working in the field of suicidology, (74) have described several advantages of using both quantitative and qualitative approaches. They argue that qualitative studies can help us to interpret and understand the relationships between variables used in quantitative studies (75). In addition to this, given that a mixed-methods approach associates a multitude of elements, the results will potentiated and enhanced. In their article, they present three possible outcomes using quantitative and qualitative approaches in an integrated way, with which we agree: "1) the results are complementary and thus provide a fuller picture of how things are related to each other (…); the results are convergent and thus contribute to validate each other; or (3) the results are contradictory and then more research is needed (75)." (p. 78).

With regard to qualitative methods, in order to understand the phenomenon, the phenomenological approach, which favors an inductive approach to access the psychic reality of subjects will be privileged. In this approach, "the researcher dwells on a specific meaning, which may be a moment, a sentence, an omission or a syntactic element" (76, p. 181). The psychoanalytic approach, which integrates both inductive and deductive approaches, will also be used.

Although distinct from the phenomenological approach, the psychoanalytic approach nevertheless proposes a holistic approach to the subject. The subject and his/her experience are thus perceived as the objects of research. Analyzing a subject's experience requires "(…) as the sole instrument of measure the observer's relationship to the observed, the observer's relationship to his/her observation, and the space in which these relationships unfold, which are as much the effect as the instrument of this "measure" (77, p. 177). Numerous quantitative methods do not place the same importance on the relationship between a subject and a researcher and on subjective factors (78). Unlike these studies, the analysis of the impact of relational and subjective factors is at the heart of a qualitative research approach.

Moreover, both the phenomenological and psychoanalytic approach support a hermeneutic approach. They are therefore convergent insofar as they place emphasis on the subjectivity of the researcher and on his/her interpretation of situations. In addition, they both require constant back-and-forth communication between the material and how it is interpreted. This approach encourages the emergence of original data and hypotheses (79). Both approaches allow the formulation of hypotheses that are not simply explanatory proposals but are rather theoretical and clinical constructs. These hypotheses link theory and practice based on what the researcher observes and interprets.

With regard to quantitative methods, a conventional approach that uses validated tools is privileged.

CHARACTERISTICS OF THE RESEARCH POPULATION AND THE FORMATION OF SUBGROUPS

The study will include a broad sample of school-going adolescents, girls and boys, aged between 12 and 18 whose bullying had stopped for at least a month. This decision will make it possible to evaluate the symptoms of PTSD when the bullying incident had occurred in the past, based on the international classification criteria (DSM V). Given that our protocol includes both a quantitative and a qualitative section, only a small number of patients can be included in the study. Approximately 60 patients will participate in the study.

We set up subgroups based on the following variables:

- Age (a group of "younger" adolescents (12–15 years) and a group of "older" adolescents (15–18 years). According to the available literature, the problems encountered differ depending on adolescents' age;
- The duration of the bullying, which would eventually determine the intensity of the trauma;
- Gender. Studies on bullying have regularly brought up the issue of gender (80, 81): boys (from 8.6% to 45.2%) are more affected than girls (from 4.8% to 35.8%) (82).
- The type of bullying; all types of bullying described in the literature will be studied: direct bulling (psychical and verbal attacks), indirect bullying (e.g. gossiping, rumors and social exclusion) and cyber bulling (bulling through technologies). The whole clinical protocol will be applied to adolescents who have suffered the above mentioned types of bulling.

Certain non-inclusion criteria will be applied. The objective of our research is not to study the acute phase (stress), but rather to explore the so-called "post-traumatic" phase. Subjects who are currently victims of bullying are thus excluded from the study. The family-relevant and psychological risk factors that will be identified will be analyzed using tools (interviews, questionnaires, Rorschach, TAT and family drawings) that assess multiple variables.

RESEARCH TOOLS

In this section, further details will be provided about the tools used by categorizing them according to their characteristics (qualitative, quantitative):

Qualitative Tools

Interviews

Data will be collected *via* semi-structured interviews. The semi-structured interview is a method that combine an approximate standardization of questions with the possibility for the participants to develop and detail their answers when needed. The authors reviewed the international and national literature on bullying to develop a guide for these interviews. Every interview will be audio-taped for later transcription, with the participants' permission, and transcribed verbatim in French.

Open-ended questions will target broad topics related to our research area of investigation while allowing participants to interpret them subjectively and narrate their personal experience of the bullying. The topics covered include relations with family and peers and bullying and trauma experiences.

In relation to the two research objectives mentioned above (cf. research objectives), i.e., the study of individual family and psychological risk factors (objective 1) and the evaluation of the

subjective trauma dimension (objective 2), relationships with others will be explored based on the following question: "Could you tell me about yourself and about your family and friends?" (interview 1-> objective 1). The subjective trauma dimension will also be analyzed based on the following question: "Can you tell me about the bullying you were subjected to?" (interview 2 -> objective 2).

Participants can choose the interview site. Their narrative determines the length of the interview. Two different researchers will conduct these interviews, separately. Each had training in the fields of bullying and qualitative research methods. Interviewers will use prompts and probes as needed to encourage the participants to develop their narrative and give a detailed account.

Data Analysis

Aiming to inquire about a clear representation of the participants' experience of bullying and its impact on their psychological functioning, the authors have resorted to a phenomenological research design for the qualitative interview. Phenomenology is a nonprescriptive approach to research that allows the essence of experience to emerge, while anchoring data analysis in the participants' unique representations (83). The aim is to explore personal experience and the subjective perception of a phenomenon. Our research approach is phenomenological in that it involves detailed examination of the participants' personal perceptions and lived experiences.

In this perspective, the Interpretative Phenomenological Analysis (IPA) will be used to analyze the interview data. The IPA, developed by Smith in 1996 in the field of health psychology (84), is an established qualitative methodology used to explore in depth how individuals perceive particular situations they are facing and how they make sense of their personal and social world (85, 86).

Built upon the principles of the IPA, an in-depth qualitative analysis will be conducted, starting with detailed case-by-case study of each interview transcript, according to an iterative inductive process. Researchers will proceed with several close detailed readings of each interview to provide a holistic perspective, noting points of interest and significance. They will then proceed, following a step by step analysis, to the description of the analytic themes and their interconnections respecting the link back to the original account of the participants. The analysis navigates between different levels of interpretation leading, at a last stage, to the production of a coherent ordered table of the emergent themes. This procedure is inductive and the analysis of the literature data is done in a later stage. The size of the sample is not decided beforehand but determined by data saturation: once the in depth analysis of the interviews doesn't provide any new themes. Following this process, the researchers can redefine the research question, look for counter-examples and hence investigate new pathways.

For validity purposes, the researches compare their coding. Two trained researchers proceed to the coding independently then discuss the emerging codes with two other research members who had read the transcripts. Independent verification aims to clarify the identified codes and ensure they accurately reflect the data collected. To increase the validity of the data, the subjectivity of one of the two researchers currently analyzing the verbatim report of the semi-structured interviews conducted among adolescents will be compared with that of the other[1]. These interviews were undertaken by different researchers who were not involved in the analysis process. This is in an attempt to reduce interpretations made following projections or the manifestation of transference. IPA-trained researchers in charge of the analysis will select common identified themes and formulate interpretive hypotheses. They will work under the supervision of an IPA-trained researcher and a researcher trained in psychoanalysis.

Projective Tests

Projective tests will complete the analysis of the verbatim reports of the interviews by promoting "the discovery of manifestations possibly too discreet to be grasped (…) by an analytical ear" (83, p. 1). They will allow us to assess unconscious psychic processes and to identify the vulnerabilities, resources and frameworks of functioning a subject maintains; this is something interviews are unable to do. Indeed, a small number of interviews alone cannot help identity a subject's unconscious thoughts because the study will be conducted a limited in period.

In clinical research, projective material makes it possible, over a very short period of time, to assess psychic processes otherwise difficult to access. It provides a snapshot of the unconscious issues that underlie the subject's psychic organization, the manifest cover of symptoms, and the discourse of patients Chabert (87). By this we refer to the possibility of accessing latent content based on the analysis of the manifest responses and narratives provided by the patient during the presentation of symbolic cards. The use of projective tests offers researchers in psychopathology and psychoanalysis the opportunity to test their hypotheses across a broad section of patients. If a researcher observes major differences and/or similarities in a significant number of subjects, he/she can then identify general trends (88–90). It must be said, however, that this generalization of results occurs without overlooking the case study and psychoanalysis.

The Rorschach and TAT (Thematic Apperception Test) projective tests will be used in this study, according to the method developed by the School of Paris. The School of Paris has attempted to show the value of this test, using an approach that draws on the psychoanalytic theory of psychic or psychopathological functioning. The School of Paris (or the French school) comprises a group of university researchers who use the Rorschach and TAT methods of analysis, which are both quantitative and qualitative (91). They draw from the studies undertaken by Anzieu (88), Rausch de Traubenberg (92) and Chabert (93–96). From this perspective, Rorschach and TAT are not perceived as "tests", as they do not meet the psychometric conditions of a real test (87), but as "clinical assessments". A projective test is thus capable of revealing defensive mechanisms and psychic conflicts inherent in the psychic functioning of a given subject. Projective tests are therefore not intended to differentiate between individuals based on a specific factor, but to distinguish between the modalities of psychic functioning, *or intrapsychic qualities*, and to evaluate their psychic importance in order to describe the personality of the subject. A projective test allows for changes in personality to be identified depending

[1]Several subjectivities will be a guarantee of a certain scientific "objectivity."

on internal or external stimuli (such as maternity, menopause or trauma). These tests can thus be used to measure the degree to which an event influences an individual's personality (92), as in the case of bullying. Our past studies identified trauma-related indicators relating to the Rorschach test in the field of sexual violence in adolescents (97, 98) and to the TAT test in the field of adults with serious illnesses (99). These indicators are present irrespective of subjects' psychic functioning. Projective tests are thus capable of differentiating what belongs to the present, and therefore to the traumatic register, from what belongs to normal psychic organization (100).

The Rorschach test is a clinical psychological assessment developed by H. Rorschach in 1921 (101). The test consists of a series of 10 ink blots and is a projective psychological test: through the responses they give, subjects freely project the elements of their internal world, their conflicts, their fantasies and their defense mechanisms, based on the material presented. While some boards are polychromatic, others are monochromatic. Rorschach is a free-response test which uses non-representational images. It is widely used in clinical psychology (102). While this test can be interpreted in widely varying ways, two major interpretations predominate today: the integrated Exnerien system (103) in English-speaking countries and the psychoanalytic approach of the School of Paris in Latin countries. The validity and robustness of the Comprehensive System approach to Rorschach interpretation has been established by numerous statistical studies (104) and by several meta-analyses (105) in comparison with MMPI (106, 107). The analysis recommended by the School of Paris relies on both quantitative elements based on normative data (108): number of responses, quality of responses etc. and qualitative elements: perception of latent content, expression of affects, etc. Diagnosis is based on a comprehensive and psychodynamic approach to these factors. The stability of the Rorschach test was highlighted by the studies undertaken by Piotrowski and Schreiber (109).

The T.A.T. (Thematic Apperception Test) is a projective test used together with the Rorschach according to the recommendations of the School of Paris (110). It consists of a series of cards depicting figurative drawings, photos and reproductions of engravings, in black and white, and more abstract drawings. Subjects are asked to invent a story for each card. The test was developed by Murray in 1935 (111). In the 1950s in France, Shentoub proposed a new method to analyze TAT cards based on the analysis of the narratives provided using a discourse analysis grid (112, 113) to reveal subjects' unconscious thoughts and, above all, their defensive mechanisms.

In this field, as in the field of psychoanalytic therapy with patients, regardless of subjects' age and the context of the encounter, the analysis and interpretation of responses leads to the formulation of clinical hypotheses[2], underpinned by the identification of several facets of psychic life:

Defensive strategies,
Anxieties,
Impulsiveness,
The expression of emotions,
The capacity for mentalization (114, 115).

The defensive mechanisms in the Rorschach are observed, among other things, thanks to:

The modes of apprehension of the material their successions within each board and within the protocol;
The quality of the answers and their contents.

At the TAT, it is the score sheet (113) that will make it possible to specify the subject's defensive register.

Anxieties in Rorschach, can be observed by studying the quality of the so-called "Clear Obscure" responses (Clob, FClob, ClobF). In the TAT, anxiety is expressed directly in the content of the stories and in the themes of the latter as well as in the impact it has on the processes of secondarization through the processes of discourse marking inhibition (CI) and discourse alteration (E4).

Impulsiveness in Rorschach is observed through factors such as:

abstract responses:
formal determinants of poor quality;
pure color responses;
overall responses of poor quality;
perseverations;
a special attention will be paid to the red color and red cards.

In the TAT, impulsiveness is expressed in the use of behaviors that can be observed during the passing of the test or through the quality of the stories.

The expression of emotions in Rorschach can be observed, among other things, through the Type of Intimate Resonance (T.R.I.) and the Complementary Formula of quantitative data, but also the formal quality of responses taking into account color or achromatism. In T.A.T., emotions are observed trough the stories and referred to in the different series of the score sheet (113).

Mentalization capacities in Rorschach are observed, among other things, through overall productivity, the large number of kinesthetic responses, in particular human kinesthetics, formal indicators no higher than the norm for F% and F+% and even slightly lower than the norm for F%, the percentage of animal responses (A%), the presence of global responses associated with human kinesthetics and a "sensitivity" to the latent symbolic of the plates (116). In the TAT, it is the productivity, dramatization and secondarization of stories that will sign the capacities of mentalization (112).

These factors are not exhaustive.

Applying a mixed-methods approach to these complex data according to the precepts of the School of Paris can allow us to restore the psychic dynamics underlying observable symptomatic manifestations and to question their place within the subject's psychic economy.

[2]In this, it is akin to the inductive approach that the grounded theory approach values.

Using both Rorschach and TAT tests is likely to give rise to data discrepancies, with a discontinuity in the results possibly interpreted as a result (117–119). Generally speaking, the interdependence of the two tests provides access to more comprehensive and diverse information that can enrich the study.

The scoring of projective tests is based on a manual that was developed following the statistical analysis of a large sample (108) or on a discourse analysis sheet (113). To ensure the greatest consistency possible across certain responses, the Thematic Apperception Test (TAT) (120) proposes an interpretation of discourse procedures and is complementary to the phenomenological method applied to interviews. Thus, in addition to the IPA and its effectiveness, projective tests can allow us to explore other aspects of patients' psychic reality and to complete or corroborate the information obtained through interviews and the SCL-90 regarding the psychological profile.

The Family Drawing

In order to assess families' risk factors (hypothesis 2), the family drawing test (121, 122) will be privileged. Unlike in classical projective tests (Rorschach and TAT), in which perceptual material is imposed, the advantage of drawings is that they incorporate an additional dimension, i.e., the adolescent's creativity developed on the basis of his/her own subjectivity. Although drawings have long been used for diagnostic purposes in clinical practice (123), their reliability and validity has never been clearly proven. Handler and Habenicht (124) underscore the need for normative data and argue that the interpretive approach of the clinical psychologist who uses this type of tool must be analyzed[3]. Particular caution must be taken when using this tool insofar as it can only have meaning in relation to other tools (126). Specifically, in the case of the present study this refers to the FAD questionnaire and interviews.

In psychoanalysis, Klein, A. Freud and Winnicott revealed that drawings were equivalent to dreams. Drawing is one of the preferred modes of communication of the child and is favored for initiating communication with children in psychotherapy. But what about drawing in adolescence? Several authors believe that adolescents' drawings have no clinical value because at this age young people have reached the stage of visual realism. For Corman (121), however, although drawings challenge adolescents' Ego ideal and reveal the self-imposed challenges in play, their drawings nevertheless reveal their capacity for regression and may provide access to the manifestations of the unconscious. While adolescents may be trapped within a certain perceptual truth that may limit their imagination, projection remains predominant. Birraux (127) refers to projection as a "tool for adolescence" and underscores the role it plays in regulating impulses specific to adolescence.

The choice of family drawings with teenagers was motivated by our clinical practice with this population. Indeed, this practice has shown that some young people are not prone to verbalization or do not have the necessary hindsight to express their experiences. Paradoxically, those who engage in verbose discussions may be reluctant to talk about their family environment during interviews as it is a subject that is particularly sensitive in this period of life. Moreover, adolescents are often reluctant to respond to questionnaires or interviews, and drawings thus allow access to their representations of their families. Used as a mediating tool7, family drawings are thus the least direct method through which to access adolescents' representations of their families (128). Using this medium, adolescents can express their experiences, feelings and desires in relation to their family history. According to Gross and Hayne (129), drawings facilitate language development and promote the expression of emotions. Drew et al. (130) advocate the use of photography as a medium that encourages adolescents' involvement in research and enhances qualitative data. It is worth mentioning, however, that this does not imply that adolescents are "made" to say what they do not want to say; rather, they are helped to express what they are unable to express clearly. In this sense, analyzing adolescents' drawings allows access to underlying family issues and the meaning these young people attribute to them. Put differently, the "quality" of the drawing and the skills involved in the production of a drawing are of no importance; what is analyzed is the level of development according to the adolescents' age.

In terms of material, subjects will be given an A4-sized paper, positioned horizontally. Pencils and colored pencils will be presented in a way that will enable them to decide freely whether to use them or not. The following instructions will be given: "Draw your family", after which they will be asked to draw *a* family. They will be thus required to produce two drawings.

To analyze the drawings, the researcher will focus on:

- The order in which items will be drawn
- The logical sequence (or absence of sequence) in which the characters will be drawn (head, body, arms, color, etc.)
- How the characters will be situated in the available space (where the drawing will be situated on the paper, whether characters will be drawn at greater or lesser distance from each other, etc.);
- Complete drawings (or not) of the characters and their emotional expressions;
- Whether the gestures, mimicking and verbalizations of the subject will accord with the drawing made.

The rating and analysis will draw on an amended version of Corman's methodology (121), revised by Jourdan-Ionescu and Lachance (122) within a psychoanalytic framework. Redundant characteristics, i.e., unhabitual characteristics, will then be removed in order to highlight the general trends. The book "Family drawing" (122) contains all the elements necessary for rating and interpretation. It is something of a handbook for clinical psychology researchers.

Several important elements must be taken into account when analyzing a family drawing (122). These include:

- Mentalization, as defined by Fonagy (115), in relation to the developmental level revealed by the drawing. **Figure 1** illustrates drawings with key characteristics of the different developmental stages of children.

[3]They focus here on "The kinetic family drawing technique" (125).

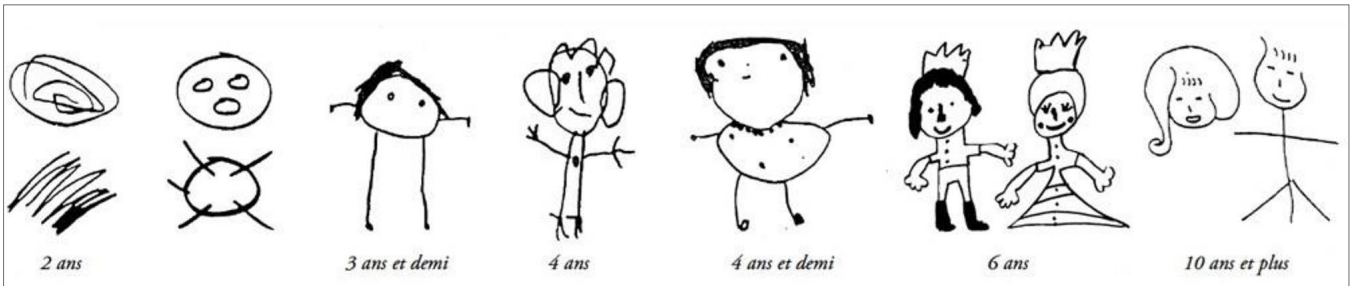

FIGURE 1 | Drawings corresponding to each developmental stage.

Any other "usual" element should be highlighted. For example, there are minor (slight variations in form) or major (scotomas) stereotypical forms that may reveal certain intra-family vulnerabilities (for example, the hand linking an adolescent to his mother may be missing). Or there may be an absence of facial features, which according to Burns (131), refers to inadequate contact with one's environment.

By comparing the two drawings or analyzing an adolescent's potential refusal to draw "a" family, the different types of identification are revealed. Corman (121) has described the identifications of *reality* (the subject is realistically drawn), desire (the projection of tendencies onto another character: in teenagers, this is often the baby who shows nostalgia for an ideal age) and *defense* to avoid guilt by identifying with the person perceived as punitive.

The representation of self in the family group through the order of the characters drawn and the care with which the different characters will be drawn. According to Van Krevelen (132) the father is the first character drawn, then the mother (in larger proportions), then the children who are drawn in chronological order according to their age. Forgetting to draw oneself may reveal a fragile representation of self or devaluation.

The nature of family ties revealed by how the different family members are positioned, the roles of each family member, and the distance (more or less) between family members;

Issues concerning the attachment and separation of the family group: are the hands and feet drawn? Can the adolescent imagine a family other than his/her own? Is the drawing colored? For example, coloring of parents and/or children and the adolescents themselves. According to Widlocher (133), the color black takes on a particular significance at adolescence and reveals modesty and restraint with regard to feelings. The dominance of black and white areas may refer to a certain depressivity, inhibition, or a split-off affect state (134).

Quantitative Tools

After presenting our qualitative tools, below are the quantitative tools employed in the mixed-methods approach. We chose to associate a qualitative tool with a quantitative tool in order to improve data validity.

The Family Assessment Device (FAD) Questionnaire

The FAD is a self-report questionnaire that assesses family functioning. It is filled in by only one member of the family. This tool was developed to evaluate the different dimensions of the McMaster Model of Family Functioning (135, 136). One sub-section of this tool (the general functioning) had been validated in its French version. This is the only sub section whose internal cohesion has been proven to be strongly correlated to all the other subscales (137). The general functioning subscale, which comprises 60 items, and a Likert scale will be used. The FAD proposes a number of statements about families (such as, for instance: When someone is upset the others know why). Participants are asked to read each statement carefully and to choose the one that best describes their family. Depending on their perception of their families, they must then give their response on a Likert scale ranging from "Strongly agree" to "Strongly disagree".

The CAPS-CA-5 Questionnaire

To assess PTSD and to respond to the first research objectives, several tools were selected. Given that the objective are to explore both the traumatic experience and the impact of adolescent bullying, the Clinical Administered PTSD Scale (CAPS-CA-5) for children over 7 years old (138) will be used. This tool seems to be the best suited for our purposes. The CAPS-5 is a 45–60 minute semi-structured interview that can be administered by clinical psychologists and researchers and has 30 items. The tool allows therapists to:

establish the current diagnosis (in the last month) of PTSD;
make a prognosis of the evolution of PTSD;
assess the symptoms of PTSD over the past week.

The CAPS-5 complements the semiology of PTSD based on the Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition (DSM-V) criteria with questions that make it possible to explore—in this study—the different criteria for bullying. Naturally, the questionnaire does not specifically focus on bullying but it is rather appropriate for this study. The questions revolve around:

the onset, duration, intensity, severity and frequency of symptoms (With the CAPS 5, the clinical psychologist combines information relating to frequency and intensity to create a unique severity score);
subjective distress;
the impact of symptoms on social functioning.

For each symptom, standardized questions are provided. The administration of the scale requires the identification of a single index trauma to serve as the basis of symptom inquiry. Other than the Criterion A inquiry included in the CAPS-5, the Life Events Checklist for DSM-5 (LEC-5) is recommended.

The original version of the CAPS has a very high psychometric quality (139). A French–Canadian version of the CAPS is available (140).

The SCL-90 Questionnaire (Symptom Check List)

The SCL-90 (141) has been validated with adolescents. An American and a French study (141, 142) revealed a satisfactory internal structure and convergence validity for the nine sub-sections. The SCL-90 assesses psychological distress and adolescents' psychopathological profiles using items that represent nine symptom dimensions. It consists of 90 items. According to Derogatis, "SCL-90 is a self-report inventory of symptoms designed to reflect the psychological profiles of "normal" populations or individuals with organic or psychiatric pathologies" (ibid. p.5). Moreover, SCL-90-R is a measure of the current state, at this moment in time, of psychological symptomatology. It is not a direct measure of personality. This questionnaire is rated and interpreted according to nine symptomatic dimensions (somatization, obsession–compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism) and three global indices of distress (Global Severity Index, Positive Symptom Distress Index (intensity), and the Positive Symptom Total (number of symptoms). This tool consists of a list of problems that people sometimes encounter. Respondents are asked to mark one numbered circle reflecting the extent to which the problems on the checklist have bothered them over the last seven days, including at the moment of completing the questionnaire [(0) not at all, (1) a little bit, (2) moderately, (3) quite a bit, and (4) extremely]. The responses are scored on a 5-point scale ranging from "not at all" to "extremely." The nine symptomatic dimensions are listed below:

Somatization (SOM)
Obsession–Compulsion (O–C)
interpersonal sensitivity (SENS)
Depression (DEP)
Anxiety (ANX)
Hostility (HOS)
Phobic anxiety (PHOB)
Paranoid ideation (PAR)
Psychoticism (PSY)
+ ADDITIONAL ITEMS (various symptoms)

Combining data from the CAPS-CA-5 and SCL-90 questionnaires could be advantageous insofar as it may lead to the emergence of correlations between the symptom profile, symptoms of PTSD and the level of psychological distress. While it is difficult to know what to expect, comparing these two questionnaires may put into perspective certain psychological tendencies among these young people.

Each tool will evaluate a different dimension (psychological, family or bullying experiences), corresponding to each of our two hypotheses. The tools will first be treated separately before comparing the data obtained in line with our hypotheses (for instance: The FAD and family drawing test to analyze families' vulnerabilities). Lastly, all the data obtained using the different tools will be compared in order to propose a comprehensive analysis of the phenomenon.

These different tools will evaluate common dimensions or concepts, thereby increasing the validity of the data and the comprehensiveness of the analysis. For example, mentalization will be assessed using four tools (Rorschach, TAT, family drawing, and interviews), or the trauma will be assessed using the CAPS-CA-5, the SCL-90 and the interviews. Each concept will be studied in relation to the specificity of each tool and then, compared through the tools, which will broaden its understanding. **Figure 2** illustrates the different steps of each tool analysis.

LOCATION WHERE DATA COLLECTION WILL TAKE PLACE

To recruit participants, public healthcare institutions and schools in which adolescents may be identified who meet our inclusion criteria will be contacted. The research will take place in France. Big cities of France will be targeted (e.g. Paris, Lyon).

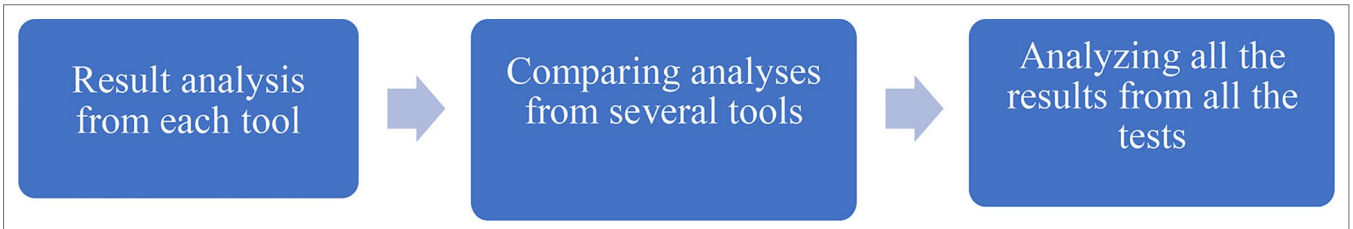

FIGURE 2 | Steps of each tool analysis.

DATA COLLECTION METHODS

Before the Study

An informative letter will initially be sent to the director of each institution to inform him/her of the study as well as the methodological procedures. In the letter, we will request him/her to put us into contact with adolescent victims of bullying. To participate in the study, both the adolescents and their parents will be expected to provide their written, informed consent. In addition, official approval will also be obtained from the institutions before meeting the subjects (ethical review board). Once the various consents have been obtained, information meetings will be held with the adolescents' reference persons to inform them about the study's inclusion criteria and to respond to their questions if necessary.

For ethical reasons, and given that this is a sensitive sector of the population, it will be ensured that these adolescents are already receiving help (psychiatrically or psychologically) or that will be receiving such help once the research ends. Interviews will be carried out at less sensitive times for the adolescents involved (for example, they will not be conducted after a serious bullying episode).

We will then conduct the study following the steps and using the tools presented in **Figure 3**.

LIMITATIONS, STRENGTHS AND PERSPECTIVES

Our objective was to submit a proposal involving a mixed-methods approach to be appraised by the scientific community in order to undertake a study among/of adolescent victims of bullying. This methodological reflection emerges from our experience gained through clinical observations of this population. We consider that this is a positive point

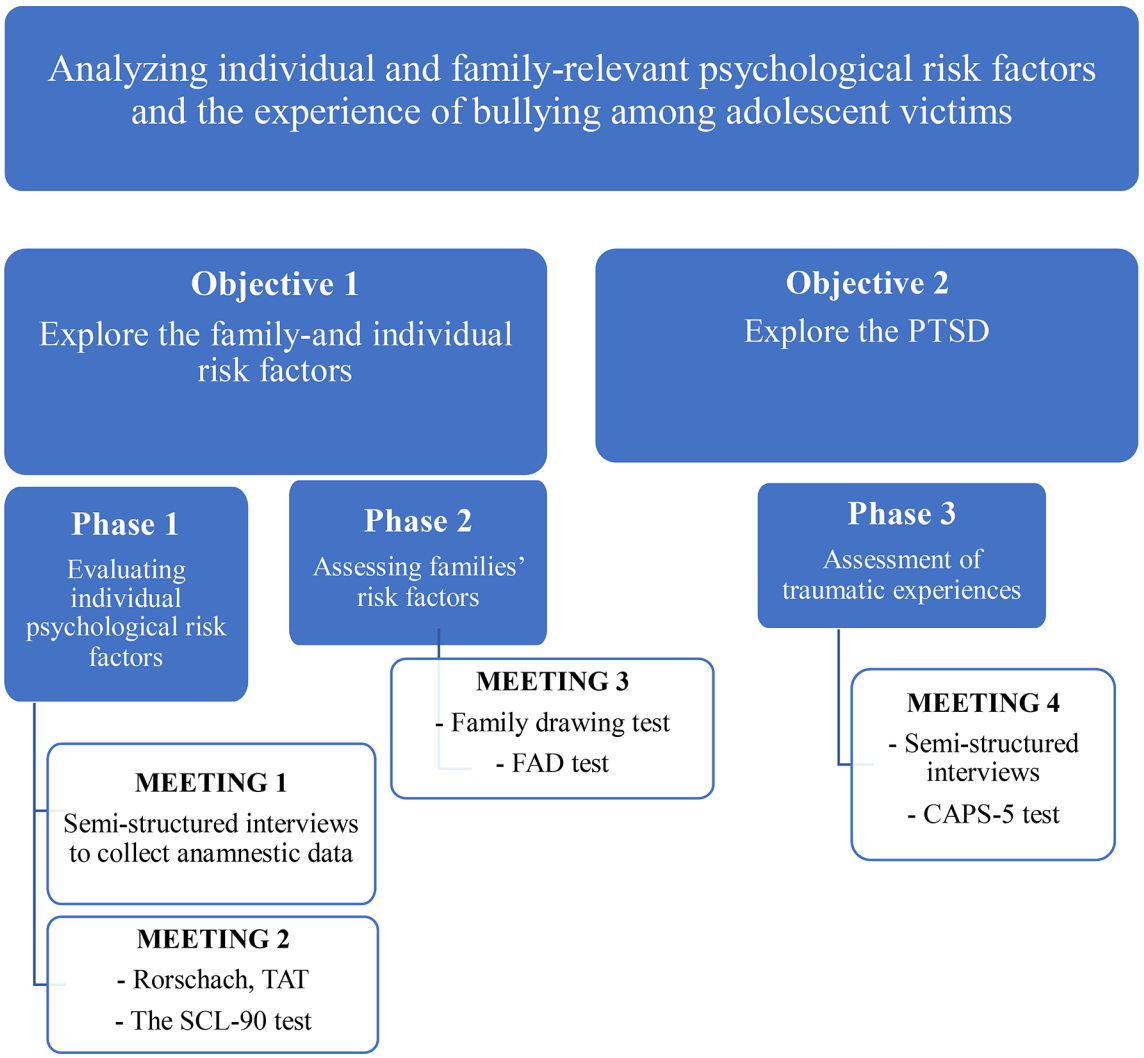

FIGURE 3 | Objectives, phases and tools.

of this work. Experimenting with this methodology and using tools habitually used in clinical settings, may enrich qualitative research.

The proposed tools have already been tested in routine care settings. But what may be expected within the context of a research study? The implementation of this kind of approach is maybe the most original point of this research. As stated by Plexousakis, et al. (52), who have made a research on bullying through quantitative tools: "future research should also include qualitative methods (interviews, etc.) that engage bullies and victims so as to clarify a deeper understanding of bullying and parental attitude or family relational dynamics through children's and adolescents' personal narrative/ experience and a discourse analysis methodology…" (52)". We strongly believe that the introduction of qualitative tools will contribute to explore various unexamined dimensions of bullying, to improve treatment and prevention and to create different research protocols. The mixed-methods approach that will be implemented will provide insights which may help improve how bullying is identified. The findings could help reinforce or revise the criteria that characterize bullying. Finally, thanks to this mixed design, this methodology may prove to have a solid scientific foundation. Therefore, the main objective is to link research with clinical practice based on the psychoanalytic field.

A more "clinical" benefit would be the ability to identify suffering adolescents. Due to the interest that the concerned adolescents will receive, along with their feeling that they are being listened to, this research design may lead to the establishment of an alliance. Those not receiving counselling can thus be encouraged to integrate a specific care program or can be guided towards a more singular and individual therapy corresponding with the research. Lastly, the tools tested using this method could be used to assess its effectiveness.

A possible limitation will be the complexity associated with such a protocol. This is indeed a time-consuming and complex protocol because of the number of tools involved and it could lead to a loss of participants. Another negative point of the approach presented in this paper is linked to the fact that it may be difficult to know if the individual characteristics that will be detected through this clinical protocol, pre-existed before the trauma of bullying or whether they are the result of bullying. We believe that the use of a qualitative approach will allow to better distinguish between the latter timing.

AUTHOR CONTRIBUTIONS

MR and DL are equal contributors to this paper (co-first authors). They both contributed to writing the paper. They have co-designed the method proposed. They have co-constructed the different parts of this paper. A-VM, F-DC and MH contributed to the choice of the tools that will be used and to writing some parts of the paper. All authors read and approved the final manuscript.

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Five Applications of Narrative Exposure Therapy for Children and Adolescents Presenting With Post-Traumatic Stress Disorders

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Narrative exposure therapy (NET) is an individual therapeutic approach that has an emerging evidence base for children. It was initially trialed with refugee and asylum seeking populations, in low, middle and high-income settings, utilizing either lay or professional therapists. The results of treatment trials for PTSD in refugee children with NET (or the child "KIDNET" adaptation) demonstrates how this is an effective intervention, is scalable and culturally dexterous. This paper describes, in five cases from clinical practice settings, the applicability of NET into broader, routine practice. The cases outlined describe the use of NET with adolescents with: autism spectrum disorders, psychotic symptoms, and intellectual disabilities; histories of forced abduction into child soldiering; complex physical health problems needing multiple interventions; and victims of childhood sexual abuse. The cases are discussed with regards to how the NET lifeline facilitated engagement in treatment, practical adaptations for those with intellectual disabilities and how NET, with its relatively short training for health professionals, can be modified to different contexts and presentations. The importance of improving access to care is discussed to ensure that young people are supported with their most complex and disruptive memories.

Keywords: trauma, post-traumatic stress disorder, children, adolescents, treatment

INTRODUCTION

The sequelae of exposure to extremely distressing events, including the development of post-traumatic stress disorder (PTSD) remain an area of poor service provision across low, middle, and high-income nations, especially for child populations. Epidemiological studies have consistently shown that exposure to a range of potentially traumatic events is common in children and that symptoms of post-traumatic stress are also common although most do not actually develop PTSD (1, 2). It is increasingly recognized that PTSD, as a result of multiple traumatic events, may lead to a more complex presentation of PTSD

than PTSD as a result of a single traumatic event (3). Children who have experienced multiple traumatic events or have a history of anxiety are at the greatest risk of developing PTSD and these experiences also have strong links with later anxiety and depression (2). It is therefore essential to improve access to treatments for PTSD in children and adolescents.

The core components of childhood PTSD, according to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM 5) categorization, include intrusive thoughts or memories, avoidance of trauma-related stimuli, negative trauma-related cognitions, a persistent negative emotional state, and exaggerated startle response (1, 4). Similarly, in the International Classification of Diseases 11th Revision (ICD-11), complex PTSD is described with similar core symptoms of re-experiencing, avoidance, and a sense of current threat alongside disturbances of self-organization which can include affect dysregulation, negative self-concept, and disturbances in relationships (5). These presenting features, in conjunction with primary caregivers often exposed to the same experiences (6–8), raise additional complexities in getting children with PTSD to enter and remain in treatment. For example, a core component of the disorder being treated is avoidance of any reminder of the original traumatic event. Therefore the individual is likely to be aware that exposure to these difficult memories is a crucial component of treatment, thus making entering treatment even more difficult (9). Parents might have similar concerns and believe they are protecting their children (and possibly themselves) by choosing not to attend a therapeutic intervention that will encourage reminders of the original traumatizing events (9, 10).

Narrative Exposure Therapy

Narrative exposure therapy (NET) is an evidence-based intervention to treat those who have PTSD and have experienced multiple potentially traumatic events; originally developed by Neuner, Schauer, and Elbert (11–13). Although trauma-focused cognitive behavior therapy (TF-CBT) has the largest evidence-base for PTSD, these trials are not necessarily conducted on those who have experienced multiple traumatic events (14). NET is one of the 2018 National Institute for Health and Care Excellence (NICE) recommended interventions for the treatment of adult PTSD (15) with the large number of NET studies categorized and analyzed under the umbrella of TF-CBT interventions. There are, however, differences in the methodology of NET when compared to TF-CBT as in NET all the significant events are explored in detail and in chronological order taking a "lifeline" approach. Most of the other studies to systematize the impact of NET have specifically collated NET trials and not in combination with TF-CBT (15–18).

NET is a short-term, manualized, individual intervention which focuses on the core premise that during a traumatic event in which there was a physiological alarm response, these memories are encoded in a non-optimal manner (19). In brief, it is believed that the poor encoding of traumatic memories is, in an over-simplified explanation, as a result of the alarm response leading to an over functioning of the amygdala coupled with a decrease in functioning of the hippocampus. Thus, when triggered, "hot" memories for traumatic events (including the emotional, cognitive, sensory, and physiological experiences of the event) are more likely to be experienced in the absence of the temporal and spatial contextual information (cold memory) associated with the event. Although the neurological processes involved are highly complex (20, 21), these disturbances can, for example, lead to the subjective experience of a "flashback"—when the event is re-experienced in the here and now. In PTSD, this can lead to a fear of encountering any possible memories and triggers of the original event. Through the process of NET, the traumatic events are placed in chronological order as the memories are re-processed through a slow and detailed re-living, connecting the hot and cold memory together with additional awareness and recognition of the wider context and the meaning of these events for the individual. Furthermore, NET aims to repair the emotional associations of the original events through the relational re-living that takes place during treatment.

In brief, the treatment involves an initial "lifeline" to be mapped, often using a rope with "stones" to denote traumatic and negative events and flowers to mark happier or positive events. Following this session, the narrative exposure begins and continues to the end of treatment. Traumatic events are explored slowly, with questioning of multiple sensory, cognitive, emotional, and physiological information, with active linking to the "cold" memory with contextual information that, due to the high physiological arousal levels, were poorly encoded at the time of the trauma. This is then written in detail by the therapist and read at the beginning of the next session to ensure content is correct, to enable some more questions to be asked about gaps in the narrative and also to expose the young person, a second time, to the original traumatic event. In NET, the therapist does not remain neutral, but rather acknowledges the human rights abuses that the individual might have experienced (22). The design of the treatment for multiple traumas and its human rights focus, together with new developments involving family members, renders the approach potentially applicable to children traumatized in a range of circumstances who may present in different healthcare contexts (12).

There have only been five trials to date using NET to treat PTSD in child populations, predominantly conducted in low and middle income settings or for refugee and asylum seeker populations (23–27). Peltonen and Kangaslampi (23) conducted a multicenter randomized controlled trial (RCT) of 50 9–17 year olds in Finland who were refugees or who had PTSD as a result of family violence. In this study, only those treated with NET, compared with treatment as usual, had a clinically significant improvement in their PTSD symptoms. This is consistent with results from other studies and case reports (11, 28, 29), which support the use of NET for treating symptoms of PTSD in those who have experienced multiple traumatic events, it has low dropout rates indicating some degree of acceptability for those with PTSD and significant improvements in PTSD symptoms both at the end of treatment and in follow-up (11, 16, 17, 30). The NET studies in children (KIDNET) have, however, been of lower quality than those in adult populations. A recent meta-analysis of NET in adult populations was able to combine results from 16 RCTs and showed that although the treatment effects are significant when compared to non-active controls, they were comparable to active PTSD control treatments. Of note, treatment effects were also significant for treatment of depression and advancing age predicted better results (18).

There has been considerable interest in clinical services to use NET for treating PTSD, as it has a relatively short training for mental health professionals, and treatment is often completed in 8 to 10 sessions. For example, between 2005 and 2019, the authors alone have been involved in training over 500 mental health and allied professionals in the UK in NET. This started with a European Refugee Fund (ERF) "Multi-Centre NET-work Capacity-building" Project (JAI/2004/ERF/090). Only a minority of the trained practitioners are working with refugee and asylum seeker populations, and most are working in generic services. These practitioners are increasingly using NET as a treatment for individuals who have been exposed to multiple traumatic events. As a result of increasing interest in this area, we describe here the use of NET and its adaptation to five very different groups of young people with more complex PTSD and share the principles of practice and some of the ways it has been adapted to these situations. The aim of this paper is to encourage practitioners to explore opportunities to treat child populations with PTSD, especially as they poorly access mental health care (9, 14). The cases below have been used as the young people gave consent for their cases to be shared. Any identifying information has been changed.

FIVE CASE EXAMPLES

Autism Spectrum Disorder and Psychosis

NET was adapted to treat a 15 year old female on the autism spectrum who had experienced both physical and sexual abuse and was an in-patient in an adolescent psychiatric unit. Her presentation had many psychotic features but during treatment, it became apparent that PTSD was the main driver of her psychotic symptoms (31, 32). Her poor expressive and receptive language, along with behavioral outbursts and agitation might have further complicated the presentation and made it more difficult to identify the traumatic component of her symptoms. For example, she reported seeing the abuser as a "real" vision, but with novel content leading to a belief that the abuser was in her home and cooperating with a family member and staff in the unit.

There are some components of NET that make it potentially suited to treating PTSD for those who are on the autism spectrum. As NET focuses primarily on the description of the original memory rather than also including associated interpretations and elaborated meta-level meanings of the events, it can potentially carry a lower cognitive load making it easier for someone with borderline intellectual disability and/or difficulties in expressive and receptive language.

The NET required some adaptations due to additional difficulties in the adolescent's cognitive and social communication needs. The adaptations included spending more time exploring each "stone." For example, with many individuals, the "stone" or traumatic event might need to be explored on one or two occasions in great detail, but in this case, multiple exposures were needed until the physiological arousal levels were lower and recollection of the events was clearer. She needed repetition of the rationale and additional time to process information. The NET was further adapted by using written prompt questions so she knew what questions to expect during sessions—for example, the core therapeutic questions asking about a range of current symptoms were written on sticky notes that could be carried all the time and provided some comfort that no unexpected questions would be asked. There were also written rationale statements explaining the process of NET to support engagement that she kept and could remind herself of before sessions. Finally, the whole treatment was conducted while walking up and down a corridor which helped to reduce dissociation and distress, and provided additional sensory coping strategies. This was perceived by the adolescent as a less intense setting than a clinic room and facilitated engagement as she did not like sitting in a room with a "therapist" just focusing on her and her experiences. Overall, the ward staff noted there was a reduction in self-harm and aggressive incidents, and a reduction in reliving symptoms.

On reflection, there were components of the psychotic symptoms that through exploration in NET were formulated to be poorly encoded memories contributing to PTSD. What was evident early in the treatment was how this young person found social interactions difficult, especially negative interactions with peers. This contributed to her experience of multiple traumas involving many negative events, a perception of ongoing bullying and other peer related difficulties—for example in the lifeline session, she placed a large number of stones throughout her life, with many events at school being highlighted. This was possibly because of her underdeveloped social theory of mind and impaired social skills, as has been described in autism spectrum disorders (33). She therefore found it difficult to appreciate different perspectives about events, and for example had a strong memory of being hit with a hockey stick at school recorded as a traumatic stone. The adolescent had recall and recognition difficulties, and low ability for new learning and so potentially perceived her memories as qualitatively different as well as often being difficult to access.

Childhood Sexual Abuse

NET was used to treat a 14 year old female in an out-patient setting, who was sexually abused by her mother's partner over a number of years. As is common for children who have experienced sexual abuse, this occurred within a context of other traumatic and distressing physical and emotional abuse and neglect, and within a chaotic home environment (34). At the time of referral, she was living in a stable foster placement with a number of professionals involved in her care. As a consequence of her early upbringing, she found it difficult to accept care from adults and was often mistrusting of others' intentions. This was also present in her peer relationships. She used self-harm as a way of coping with high levels of emotion and, at assessment, she said that she often found herself becoming extremely angry for no reason. Upon formulating, we recognized that many of these difficulties were triggered by reminders of her past experiences, which were compounded by frequent flashbacks and nightmares. Her school attendance was low as she felt that school staff did not understand her or her past experiences.

She was given a choice between NET and TF-CBT. She chose NET as she felt that she had never had the chance to talk through all her experiences together. There have been two trials of NET in adults with PTSD with comorbid personality disorder, which have demonstrated a considerable reduction in symptoms of both PTSD and borderline personality disorder (35, 36). Given this patient's self-harm behavior and difficulty with her

emotional regulation and relationships, it was decided that NET might be able to address the breadth of her symptoms and needs, informed by components of these studies.

The NET protocol was adapted to ensure that the network of adults around her was included in the psychoeducation and treatment plan as it was important to ensure safeness and consistency in the system surrounding her (37). This involved additional meetings with her social worker, welfare officer at school, and foster carer to explain the process of therapy and to discuss how to best support her through the process, particularly when narrating a stone. After completing the lifeline, she decided to share her lifeline with those involved in her care. For her, this exercise, in itself, helped her contextualize the multiple trauma she had experienced and voice her story. She also felt that, after doing this, her school had a better understanding of what she had been through and were better able to think together with her foster carer about how to make school more manageable. Her foster carer attended the end of each session so that she could share and discuss as much as she wanted about the stone that had just been explored. She felt that this further helped those around her understand her experiences and to think about how to, jointly, manage the upcoming week and encourage attendance at the next treatment session.

On reflection, the young person responded well to the adapted NET, which included involving the professionals in her care and to bring in her foster carer at the end of each session. By the end of 12 sessions, her PTSD symptoms had reduced greatly, which also led to a reduction in self-harm and anger outbursts. Furthermore, her school attendance improved, as she felt those at school understood her better and were able to discuss and agree a coherent plan for managing any expressions of distress that might arise. There was also less conflict reported at home. For her, the collaborative approach involving individuals from the different systems understanding her better and supporting her, contributed to a sense of containment and safeness while undergoing NET.

Child Soldier

NET was used to treat a series of child soldiers in the Democratic Republic of Congo (DRC) (38). Some children have not only been the victims of human rights abuses, but have also perpetrated them. Robjant *et al.* describe the treatment of 100 female former child soldiers abducted during the M23 war in Eastern DRC (38). This case was typical of those seen. A 17 year old presented for out-patient treatment. Abducted during a village attack, aged 12, she was taken with her male and female peers by a much-feared armed group. Within 24 hours she was raped, and later was forced to torture and kill some of her peer abductees. Thus began her "training" as a fighter which involved extreme physical brutality. At night, unlike the other girls who were afforded the title of "wife of soldier" and regularly raped by one person, she was "unassigned" and thus visited frequently by different men and groups of men. This afforded her a lower social status, as well as a likely increased trauma exposure, and as such she attempted to increase her status (and life expectancy) by being a better "fighter" using increasingly violent and deadly means (38).

Once freed back into the community she was using violence against others to reduce her own exposure to both her PTSD symptoms and extreme feelings of low self-worth. At the time of assessment, she was actively involved in the "set up" of females in the community to be raped by males "so that its just not me," and was also involved in multiple incidents of physical violence against community members. Some of these acts of violence appeared to be instrumental aggression or related to general hyperarousal, but others were directly related to violence perpetration for pleasure—known as "appetitive aggression" (39). There is evidence that appetitive aggression is protective against PTSD symptoms and thus a protective factor for those living in unstable contexts (40, 41). In addition, she was self-medicating with alcohol when she was able to obtain it.

The treatment of this case involved an adaption of NET for perpetrators (FORNET) (38, 42), for example by marking acts of perpetration on the lifeline with "sticks." Other adaptations include holding group sessions as part of the treatment which include: learning skills to manage affect regulation especially targeting anger; motivational work in avoiding violence; problem solving to help manage stigma and prejudice from community members (who often feared the returning abductees and sought to isolate and reject them); and active peer support through a buddying system (38).

Like others in the trial, this young person responded well to the adapted version of NET which involved only five individual exposure sessions. These sessions had a focus on re-processing traumatic events in which the traumatized individual had played different roles, at times as a perpetrator of events and other times not. Typically the lifeline showed large numbers of traumatic events, many of which also included perpetration of violence, and so in order to fit with the context (requiring low resource input) priority was afforded to events which were of different types, in differing contexts and which were related to symptoms (38). As was typical of the wider treatment cohort in the RCT, PTSD and depressive symptoms were reduced to the extent that she no longer met criteria for a diagnosis of either condition, appetitive aggression was reduced, but more importantly she had fewer episodes of actual violent behavior. In this particular case her alcohol use significantly reduced, in keeping with current theorizing about the role of trauma in substance misuse and the importance of trauma treatments for those who have substance misuse problems (43).

Facilitating Engagement With Treatment

A 17 year old male was first referred to child mental health services for urgent multi-disciplinary input following initial support from the local mental health crisis team. There was a history of known trauma over a long period of time and his father was serving a prison sentence for abusing a sibling. Input included weekly individual therapy for initial diagnoses of severe depression, anxiety, and an eating disorder. After 3 months, the additional diagnosis of PTSD was established, and the young person chose NET over TF-CBT because although he was wary of interventions, he liked the idea of doing a lifeline and so he initially only agreed to attend the lifeline session.

NET was therefore adapted so that he could receive a first lifeline session before he committed to further treatment in the knowledge that as a potential stand-alone session it would not treat his PTSD. It did however contribute to a shared understanding and formulation. Although he was initially cautious about further treatment as avoidance of any reminders of his traumatic experiences was so

strong, he decided to continue with NET after 3 months. Following completion of NET, he explained that he had not felt secure enough to "open up" at the beginning of the treatment as talking about his PTSD symptoms was more difficult than addressing depression or anxiety, and hence he needed longer to develop a trusting therapeutic relationship.

While he had experienced multiple and varied traumatic experiences from age 7 to 16, the visual representation of these as a lifeline helped illustrate how a number of stones related to the same events, the impact of which had not been fully appreciated. The trigger for this specific trauma was a current one, relating to a family member still living in his home. The treating team were then able to enhance the support offered by incorporating components to consider safeguarding and support within his home as well as treating the PTSD. The subsequent NET intervention was successful in reducing all reported symptoms of PTSD monitored by changes on the Child PTSD Symptom Scale (CPSS) and Impact of Events Scales supporting the clinically-observed and reported improvements (44, 45).

Reflecting on his experience of NET afterwards he felt that the initial task of completing the lifeline had helped his decision to proceed with NET. It was a non-threatening and relatively simple way of introducing NET so the young person could make a more informed decision about further treatment. He also, later, described this session as cathartic. As is not uncommon, it took him a few months until he felt able to commence the full NET, by which time his mood and risk had stabilized and regular sessions could be arranged around his availability. The visual representation of traumatic experiences in the lifeline led to a greater understanding for both the young person and therapist which then guided further interventions in the mental health service.

Chronic Health Condition Needing Multiple Interventions

A 15 year old female who had had multiple cardiac surgeries from a young age had been seen by the hospital's psychological medicine service for years of support following her operations as well as for sleep and anxiety difficulties. At a routine follow-up after heart surgery, it was noted that she was becoming anxious about medical procedures and described symptoms which were qualitatively different in their nature and intensity to past difficulties. A thorough clinical review revealed symptoms related to the build up and recovery from the most recent surgery, high physiological arousal including tearfulness, not feeling her usual self (reduced enjoyment and connectedness), cognitive avoidance of things connected to the surgery, and disrupted sleep. The intensity and duration of these, along with their level of impairment, were suggestive of PTSD, a diagnosis the young person agreed with.

Following a discussion about treatment options she agreed to start NET with her regular therapist, to aid a sense of security. Despite the therapist having worked with her for a long time, the stones she identified in her lifeline were not those that had been expected but included the psychological consequences of cancellation of a surgery at short notice and the visual image she had of herself post-surgery. The young person engaged well with the sessions and was able to work through the NET process in a structured and contained way.

The adaptations that were made were primarily around the considerations needed in a busy acute hospital setting, to ensure that clinic rooms were not too noisy, with sounds that might be triggering such as crying children. This was especially important given that the hospital was the main trigger for her and so managing the intervention within that setting added an extra level of complexity for the patient. She was taught some grounding techniques prior to the work starting along with psychoeducation about how the symptoms might at times increase in intensity.

At the end of the NET, the young person reported a significant reduction in PTSD symptoms, although these did re-emerge to a lesser extent at key anniversaries, such as of the surgery, but were more manageable. NET was a helpful way of processing the traumatic memories associated with major surgery and the lifeline helped to identify which of the many potential experiences were the ones she needed to explore.

DISCUSSION

This paper has described a number of clinical applications of NET that have been used to treat a range of cases of children with PTSD, some in relatively typical clinical settings and others more unusual. Although the majority of the evidence-base lies with populations who have experienced forced migration and organized violence, there are many other children and young people who have experienced multiple traumatic events who could benefit from NET. There appears to be wide applicability of NET to those affected by trauma in different settings including with co-morbid diagnoses. Therefore co-morbidity should not hinder referral for NET. Furthermore, young people who might not traditionally access PTSD treatments, such as those on the autism spectrum, or with intellectual disabilities, could engage well with NET and it should be seen as a priority and human rights imperative that these particularly vulnerable populations have access to PTSD interventions. These young people are often deemed "not ready" or "not able" to access treatment or that it might be "unsafe." The case studies reported here and the wider literature suggests NET is appropriate and can be adapted to enable engagement and treatment (18). Furthermore, NET has demonstrated that even in contexts of ongoing difficulties and active danger, treatment can benefit those who have PTSD and that objective measures and requirements of "safety" might incorrectly hinder many from accessing or being offered treatments.

There were a number of components of common practice in all of the adaptations: the lifeline was an important part of the NET as it helped guide the number of sessions that might be needed and provided an anchor for the young person's different traumatic exposures. Many found it helpful and some wanted to share their lifelines with key adults. Exploring the traumatic events in detail was tolerated to various extents, and all managed to complete the treatment. The treatment could be delivered in busy hospital settings as well as while pacing a corridor, it has predictable repeated questions when exploring the traumatic events which can provide comfort and containment. Many had

been living with their traumatic memories for a relatively long time which suggests that improving access to effective treatments is not only necessary but possible, even if their case presentations contain specific details which may seemingly complicate progress during therapy.

Conceptualizing trauma as an event which, when experienced, destroys components of personal autobiography helps us appreciate how this approach, which includes the "lifeline" early in treatment, is important. NET has also been used by the authors with parents who have cared for physically unwell children who have needed repeated investigations. Their post-traumatic symptoms have impacted on their ability to bond with their children as well as impair their functioning. Engagement in treatment can be particularly challenging for those who have PTSD, especially for younger populations. The lifeline in some of these cases has been shown to be a potentially useful tool to facilitate engagement. It provides a relatively simple way to start to acknowledge and address past experiences, by at least naming them and placing them in chronological order. The process of NET also seems well suited to multiply traumatized populations, as no one particular memory needs to be identified early as an "index" case. All "stones" can and should be explored, as well as allowing for additional episodes to be included at later times. Sometimes the most difficult memories are not identified early in treatment as the therapeutic relationship needs to develop and the young person might not trust their therapist or believe that exploration of the event will be manageable for them. The complexity and importance of the therapeutic relationship needs to be appreciated in young people who have experienced multiple traumatic events as they are likely to have had abusive relationships with adults which can add to significant engagement challenges (46). This was discussed in one of the cases, but has been apparent, to a lesser extent, in much of the work conducted. As the therapeutic relationship develops and trust in the process increases, then young people might be better able to explore their most difficult and unmentionable experiences.

These examples give us cause for optimism. As noted by a recent meta-analysis, NET is an effective short-term therapy for reducing symptoms of PTSD and depression, particularly for war-affected refugee populations and adults (18). Although a significant proportion of those studied do not respond to treatment, for those that do, function can improve substantially. This review also noted the marked absence of studies directly comparing NET to other trauma-focused psychological interventions. Nonetheless, these case examples suggest that NET can be effective for the younger population in a wide-range of contexts with PTSD from exposure to multiple traumatic events. The applicability of NET to different situations and the relative accessibility of training in NET should be noted. The training, for example, requires 2–3 days for mental health professionals and longer (up to 2–3 weeks) for lay therapists. This makes NET a potentially scalable PTSD intervention, especially for harder to reach and more vulnerable populations where lay-therapist options, possibly through third sector organizations, might be crucial. The evidence base for NET still needs to be improved as many of the RCTs so far have been hampered by small sample sizes, non-active control groups, limited follow-up, and primarily refugees and asylum seekers studied. Furthermore, in clinical practice and research, identifying routine outcome measures that carry minimal cost and complexity as well as capturing the key symptoms and functional outcomes would dramatically facilitate improved understanding of treatment efficacy in younger populations.

NET was perceived by those included in these examples as non-threatening, although initial engagement difficulties are always likely for those with PTSD, given how prominent avoidance is for reminders of the original traumatic events. In NET the young person will be aware that they will talk about these experiences in great detail. There is a flexibility of where NET is delivered, it was originally tested in refugee camp settings, yet in these examples was conducted in a range of environments. It might even be suited to being conducted in schools where young people might find it easier to access support, raising the possibility of prevention of later psychopathology. This is aligned with the "building block effect" theory where cumulative exposure to trauma leads to increased likelihood of PTSD, therefore the role of early processing to try and prevent further harm needs to be better studied (43, 47). Exposure to potentially traumatic events might even help us understand a wider array of psychopathologies than PTSD and therefore exploration of poorly encoded memories using NET may be applicable in more contexts than just those where PTSD has fully developed. The more opportunities to study, train, and deliver treatments for PTSD, especially for child and adolescent populations is now essential, given the increasing understanding we have of the broad negative impact on child development of exposure to traumatic events and the need to make psychological treatments more accessible.

ETHICS STATEMENT

All individuals gave written informed consent for their potentially identifiable information to be included in this article.

AUTHOR CONTRIBUTIONS

All authors contributed to the manuscript, were involved in writing the first draft of the paper and provided input to all stages of the paper.

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Under-Age Children Returning From Jihadist Group Operation Areas: How Can We Make a Diagnosis and Construct a Narrative With a Fragmentary Anamnesis?

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Introduction: Since 2011, the French government estimates that about 500 French children have been born in or taken by their parents to areas where terrorist operations prevail. Since May 2017, 75 children who returned to France have benefited from a dedicated health care system.

Method: This article is the result of clinical interviews conducted with 53 patients evaluated and taken care of at Avicenne Hospital in Bobigny. To our knowledge, no studies have been published on this subject.

Results: A total of 32 evaluations have been completed, all of which indicated the need for care for these children. Of these children, 64% are under 5 years old, and 59% were born in France. Their clinical profiles are heterogeneous and fluctuate with time.

Discussion: The multiple adverse events experienced by these children and the uniqueness of children born to families suspected by authorities of having participated in activities related to terrorism make this situation unprecedented. How can we make a diagnosis of PTSD without the help of a precise anamnesis? How can we help these children form a structuring narrative that avoids the pitfalls inherent to generalized fascination?

Keywords: child returnees, stress disorders, traumatic, war exposure, terrorism

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INTRODUCTION

The French government estimates that about 500 under-age children were born in the Iraqi-Syrian war zone or taken there by their parents (1). France is the European country with the highest number of under-age children who were raised under the "Islamic state" (2). The return of emigrated families to their countries of origin is a major challenge for governments and actors in the field.

Faced with this exceptional and unprecedented situation, the French Government implemented a dedicated support system for the return of these children (1, 3). It has several different components: security, child protection, health, and education. The health component is independent of the others, in compliance with the rules of medical ethics.

Since May 2017, 75 children returning from Iraq, Syria, or other terrorist war zones (Afghanistan, Mali, Yemen, etc.) have benefited from this system. The vast majority of these children (74%) were taken care of by the Avicenne medical team. The purpose of this article is to report on the particularities of this on-site care. First, we will describe the dedicated support system implemented by the French government for the return of children from the jihadist group operation areas; secondly, we will present some data concerning the clinical profiles and questions raised by the first wave of children assessed by the Avicenne psychiatric team around the diagnosis, the construction of a story, and the interinstitutional link.

To our knowledge, no studies have previously been published on this subject.

MATERIALS AND METHODS

The present article is based on the expertise emanating from our clinical encounters. It is the result of the care of the 53 patients assessed and managed at the Avicenne site between March 2017 (the date of the first patients being taken care of, just before the installation of the dedicated support system) and June 2019. We present data and reflections that have issued from our clinical assessment. Data were collected by psychologists and child psychiatrists as part of their clinical care, and reflections arise from discussions in our team meetings. We have not yet been able to carry out an epidemiological study because of the specific context, the low sample number, and the age of the children. Therefore, the agreement of an ethics committee is not required. Due to the many pitfalls involved in completing standardized questionnaires for this specific clinic, we conducted a systematized clinical assessment of the child with detailed note-taking, and the diagnosis was made by the consensus of the clinical group.

RESULTS

Description of the Dedicated Support System

France is the first country to have implemented a systematized care scheme for the assessment and care of minors returning from jihadist group operation areas. Three university centers have been designated in the Paris region, in Bobigny, Créteil, and Versailles, each including a child and adolescent psychiatry department and a pediatrics department.

Two Prime Ministers have drafted instructions specifying the measures to be implemented by every state service for the return or arrival of these children.

The majority of the children return with a parent, most often their mother. In many situations, fathers are dead or presumed dead. In some cases (parents deceased or incarcerated in the area), the children are brought to France by a humanitarian association. In both cases, when entry into France is scheduled, upon arrival at the airport, they are separated from their parents (when accompanied by them). The parent(s) is (are) placed in police custody and pre-trial detention upon their arrival.

The Paris Public Prosecutor's Office coordinates the system and refers the matter to a juvenile judge. The latter entrusts the children to the Child Protective Services (CPS) and requests a socio-educational investigation of the child, of the parents, and of the extended family (grandparents, uncles, aunts, etc.) to assess the possibility of the child's return to his or her family, as well as their capacity to accommodate the children.

The judge can place the child in a children's shelter or, more often, with a foster family. In conjunction with the social services, the judge decides on the subsequent general care.

For children born in France or in an internationally recognized country, the parental authority of a parent is maintained. Mediatized visits to prisons, in the presence of children's professionals of the educational services, are organized at a variable frequency in order to maintain a strong parent–child relationship. The judge may also authorize a stay with the extended family.

On the other hand, for children born in areas where terrorist groups prevail, their filiation is not always established upon their return to France, as they do not have an internationally recognized civil status. Genetic explorations of the child and those hypothesized to be most likely to be their parents can be asked for by the juvenile judge to establish filiation.

Before the child's arrival in France, parents sign a consent form for a medical checkup and may provide information on the child's conditions and lifestyle (breastfeeding, allergies, sleep, type of relationship with parent(s)/siblings, etc.), but this information is not always completed or transmitted (in Avicenne, this assessment had been completed for only three out of 32 patients (9%)]. A medical examination is conducted at the airport to avoid emergencies, and a day of pediatric hospitalization is organized during the first few weeks following their arrival. A child psychiatry assessment is carried out within the framework of weekly consultations, over a period of 3 months, by a psychologist or child psychiatrist. Children are then placed into medium- or long-term follow-up if necessary and referred to other health professionals if needed (speech therapist, psychomotor skills, therapeutic group, etc.)

Children who have grown up in war zones may have been confronted with multiple adverse and traumatic events in their early childhood: exposure to traumatic images, bombardment, violent death of one or more family members, incarceration

before transfer to France, uprooting, and severing ties. In most cases, upon assessment, we have very little information about these children's histories. To date, for the health care professionals, meeting with the parents in prison is not implemented, as it still raises clinical, ethical, and institutional questions. The anamnestic elements are reported to us through our partnerships, mainly *via* the educational services that meet with parents in prison, organize mediatized visits, and make the connection between parents and the health service.

In addition to the symptomatic assessment of the child, assessment of the child's relationship with the foster family is essential. At each consultation, we meet the foster family with the child to collect the child's symptomatology at home, to support the creation of a bond, and to identify any possible difficulties.

Description of the Avicenne Sample

Between March 2017 and June 2019, 56 children were referred to the Avicenne Hospital; 53 had at least one consultation in the department, and seven were redirected to the other centers. To this day, Créteil and Versailles have taken care of six and 20 children, respectively.

Among the 53 children received at the Avicenne hospital, 32 assessments were completed and 21 are being evaluated, all of which indicated the need for care for these children (see **Table 1**).

The 56 children referred to Avicenne hospital were between 2 months and 17 years old when they arrived (4). Of these, 37% were under 2 years old, 27% between 3 and 5 years old, and 29% between 6 and 12 years old. Adolescents (13–17 years old) form a minority group (7%). In terms of place of birth, 59% were born in France, 30% in Iraq-Syria, and 11% in another country (see **Table 2**).

In children, clinical profiles are heterogeneous and highly variable. The disorders observed are also encountered in other situations where children have experienced trauma and separation from the main caregiver.

During the first assessment interview (see **Table 3**), we observed sleep or eating disorders and acute stress states. These symptoms may be secondary to separation from the parent(s), relocation and migration to France, adaptation to the foster family, etc. Separation in placement situations is in itself a potentially traumatic event, especially if it has not been adequately prepared for, which is the case in the majority of our cohort. Of course, not everyone will develop the symptoms of PTSD.

TABLE 1 | Number of children that benefited from the dedicated health care system (May 2017 – June 2019).

Variable	Number of children
Supported by the health care system	75
Within Avicenne Hospital :	
Adressed :	56
Attended consultation :	53
Being evaluated	21
Redirected to the other centers:	7
Completed the evaluation:	32

TABLE 2 | Demographic characteristics of the 56 children referred to the psychopathology department of Avicenne Hospital between March 2017 and June 2019.

	Number	%
Age of children on arrival in France		
0-2 years old	21	37%
3-5 years old	15	27%
6-12 years old	16	29%
13-17 years old	4	7%
Child's place of birth		
France	33	59%
Iraqi-Syrian zone	17	30%
Other internationally recognized country	6	11%

We often receive children very soon after separation from their parents. This therefore induces a specific symptomatology, which is added on. The diagnosis of acute stress disorder is then made. These acute stress states may subsequently improve or persist. The clinical profile of these children varies widely: some children have no symptoms and seem perfectly adapted. Other children have global developmental or language delays. Others, on the contrary, show a good level of development, with skills appropriate for their age group.

At the end of the assessment (see **Table 3**), attachment disorders, depressive episodes, anxiety disorders, and adjustment disorders are among the most frequent disorders identified in these young patients. The diagnosis of post-traumatic stress disorder (PTSD) or complex PTSD is often difficult to confirm because of a lack of anamnesis. Some patients initially exhibit very few symptoms over the 3-month period, but after many months of follow-up, following an event such as a visit to the prison or a change of living quarters, symptoms are triggered in a delayed manner that were initially absent. This observed fluctuation in the disorders exhibited is classic in the trauma clinic (5). The persistence of separation from parents continues, of course, to affect the clinical expression of disorders, even in the long term, but so do the many disruptions that affect the child: visits to prison, meetings with sometimes unknown family, the start of schooling, etc.

TABLE 3 | List of symptoms observed among the 32 child returnees by the Avicenne team.

Main symptoms observed at initial assessment	Sleep disorders Separation anxiety disorders, acute stress states Eating disorders Global developmental delay Language delays No symptoms
Main symptoms/diagnoses observed at 3 months	Attachment disorders Depressive disorders Anxiety disorders Adjustment disorders Posttraumatic stress disorder (PTSD) or complex PTSD No symptoms

Acute symptomatology is therefore not necessarily predictive of a chronic disorder. The absence of an acute disorder does not guarantee a favorable course: symptoms of a likely delayed "PTSD" (5, 6) may appear. Evaluation over a long period of time is necessary to sharpen our eyes and make a stable and reliable diagnosis.

DISCUSSION

The unprecedented context of children returning from a terrorist war zone gives rise to several questions at the clinical level but also at the level of the general system that surrounds the child. As a preamble, it should be recalled that the diagnosis of PTSD obviously does not summarize all the clinical symptomatology of the child secondary to exposure to one or more traumatogenic events and caregiving ruptures. This diagnosis should be used with caution in children under 12 months of age (7). Nevertheless, we chose the PTSD diagnosis as an example to illustrate the diagnostic difficulties encountered in this situation. Searching for the presence of this diagnosis has been defined as the first objective of the child psychiatric assessment in the system (1).

This support system for minors returning from an area where terrorist groups prevail is unique for several reasons: first, we have very little information on the child's anamnesis of their first years of life. Unlike most children we assess in a traditional child psychiatric setting, we do not have access to the history of parent/child interactions, nor to parents' stories. When the parents are in prison, the known elements are reported to us by the educational services, who meet the parents or have access to documents in the judge's file. Parents' comments are therefore not collected directly by our team. Professionals who meet with parents note that parents frequently seem to minimize their children's traumatic exposures. In the majority of cases, we therefore know little about the child's previous condition before the separation from his or her mother. Cultural factors shape the expression of psychiatric symptoms in children (8). These children were raised in French families, in the context of Islamic state, and little is known about their environment. In many cases, not only do we not have access to the parents but also to the extended family, carriers of the child's cultural cradle. We therefore work with the descriptions of the educators who met them.

However, in order to diagnose PTSD, the first criterion is to know the history of exposure to traumatogenic events. Indeed, according to DSM-5, the first criterion for children under 6 years of age is "to have faced death or a threat of death, serious injury, or sexual violence" (9). This first exposure criterion is also used in the DC classification: 0–5 (7), according to whether the child experienced the traumatic event, heard or saw the event occur to others, or learned that an event of this type had occurred to a person in the child's immediate environment. Following exposure to this event, the onset or reactivation of a typical symptomatology of PTSD in children is observed. However, for most of the patients we met, we do not have access to the anamnesis elements that are so necessary for diagnosis. We very rarely know if the symptoms observed existed before their arrival in France. Also, we do not know the reaction of the parents or adults present when the child was exposed to potential traumatic events. The diagnosis of adaptation disorder is therefore often retained by default. It can be very difficult to distinguish PTSD from persistent complex bereavement disorder, especially in young children. Sometimes a child may develop both posttraumatic stress disorder (PTSD) and persistent complex bereavement disorder. In many situations, the father is "missing" or "presumed dead" because the body has not been formally identified. In this case, it is very difficult to make a diagnosis.

The use of standardized questionnaires to assess trauma is problematic at different levels. Almost all scales or diagnostic structured interviews that assess children's PTSD (10–14) require access to this history. Should it be considered that having been raised in a so-called "war zone" is sufficient exposure to enlist the diagnosis (11)? For our patients, it is difficult to generalize exposure, which must always be assessed individually, according to the exact living space in the area. The vast majority of diagnostic scales or structured interviews are for children over 6 years of age (10–12, 14). Some caregiver heterosurveys assess the child's symptomatology, particularly those for younger children (13, 15). They are therefore difficult to use at the beginning of placement, as foster families do not know the child. Moreover, we cannot assess which symptoms are reactive or not. Other questionnaires refer to only one traumatic event (10).

Beyond this pitfall in diagnostic terms, the impact of this "not knowing" in the clinic is disconcerting for the therapist and can be a source of misunderstandings. The risks of a story without witnesses have been described in the context of international adoption. The "holes" in children's stories act like real scotomas, secrets authentically shared by all: the child, his foster family, and the therapist who has the child in charge. Their consequences are less harmful than family secrets, in which there is a conscious desire to hide life events from the child (16). Nevertheless, according to Christian Lachal, in the context of international adoption, "the clinical expression of traumatic events "scotomized" by the rupture of witnesses to a story probably exposes them to a high risk of psychological impasse" (16). Mediatized meetings with parents are therefore essential for the child to reclaim his/her story. The therapist must help the child make connections between elements of incomplete narratives so that he can build his narrative identity (17). The existence of this story, and not its content, therefore plays a fundamental role in child development (18, 19). The narrative of a life allows us to mediate, to weave links between the discordances (ruptures, reversals, and twists) and concordances (overall arrangement) of a life (20, 21). But these scotomas add an element of mystery to this patient care, which exposes us to the risk of filling the gaps with negative representations, of projecting personal fantasies. The lack or absence of an anamnesis is a situation that the therapist may face in other cases, such as with foster children. But the fact that these children were born or taken to an area seen as "enemy," born of people who may have committed criminal or

illegal acts, may lead to a possible fascination or increased fear on the part of the adults around them. These representations can be amplified by the post-attack context and the media. The shock and astonishment following the various attacks in France may reflect a form of suspicion, fear, mistrust, excessive knowledge, or, on the contrary, feeling of incompetence towards these children. In the interest of the child, any professional in charge of these situations must nuance his own representations of parents, i.e., make several narratives co-exist. For example, even if the parents have participated in terrorist acts and are criminals, it seems necessary to be able to assume that some children who have satisfactory psychomotor development have been well carried as babies, in the sense of the holding (22).

We have already listed the possible traumatic events experienced by these children. Upon their return to France, they encounter other difficulties. The filiations of children born in the area, who do not have the documents legally recognized by the French State, are sometimes questioned. Most of the children we met have very full schedules, with multiple appointments (parents in detention, extended families, social workers, etc.) that they may not fully understand. This can lead to a certain confusion linked to the setting and purpose of each appointment and exposes the oldest children to multiple repetitive questions from professionals, on a past that may be painful because it is full of ruptures. During the initial meetings, the child may be suspicious. We spend a lot of time explaining to the children who the different professionals are, where they fit in, and how our role is distinct from the justice system. Indeed, some children may show a certain ambivalence towards professionals in the justice system, as they not only take care of them but also represent a system that deprives them of their parents. In this context, it is even more difficult to establish a diagnosis at the beginning of the assessment. The concept of cultural safety, widely used in Anglo-Saxon countries (23, 24), leads us to question our care practices and the whole system that welcomes the child. The families of these children are French, and have, for the most part, raised these children in a context of migration, rupture of family ties, and in a radicalized ideological and religious context. Often, on their return, the children question the host families, but more broadly the adults around them, about these cultural, religious, and ideological differences. They will be led to crossbreed their logic of representations. We work to accompany them in this process and to help the host families to welcome the child fully, with the contradictions he or she may bring to light.

Upon their return to France, the risk of rupture persists, with some children being moved between several foster families, as have so many other placed children. Another major risk upon their return to France is that of stigmatization. The representations conveyed by some media of these children, seen as "our enemies," fuel certain societal fears of a supposed risk of future criminal acts. Therefore, the lack of information on their living conditions in the area acts as a real fantastical amplifier, as we have seen. To what extent does the fantasy of dangerousness prevent communication between partners? The different vocabularies used by partners in different professions further increase the risk of misunderstanding. For example, the term "traumatic games" may be differently understood by a judge, a child psychiatrist, or an educator. Additionally, the child's prognosis, in the eyes of each professional, differs according to his symptomatic reading grid. Another difficulty encountered by the institutions is the question of the transmission of information. What is part of the shared secret? What is part of the medical secrecy? As we have said, we are in contact with host families, educators responsible for child protection, and justice professionals. Every time we meet, on a case-by-case basis, as always in situations involving foster children, we are led to make choices about the relevant information to be communicated in the best interests of the child and which information is more likely to fall within the confidential scope of the interviews. The specificity of this care is the difference in temporality: the timescale of the first assessment of justice is very short compared to the timescale of care. This can lead to more pressing demands from other professionals.

"Trauma is made to be transmitted, this seems to be one of its major characteristics" (25). The effects of trauma on caregivers have been widely studied in the literature, particularly through the lens of counter-transference (26–29). However, the effects of the trauma affect all professionals working with the child, and in the first place, foster families, who are at the forefront of supporting these children. During our encounters with children, we have rapidly become aware of the necessity to accompany fosters families, to help them develop their representations and make sense of the scattered stories of the children. A supporting group was set up for this purpose at the hospital. Training families and professionals on the impact of trauma on childhood development is an essential task of the clinical team. Supervision and analysis of practices are essential to ensure that everyone does not fall into the pitfalls involved (fascination, fear, feelings of incompetence, etc.)

Given the over-publicization of these patients (most of their names have been published in the press) and the number of children concerned, it seems very difficult to publish clinical cases. Patients would be quickly identifiable. Furthermore, epidemiological studies, with standardized scales, are needed in the future to increase the reproducibility of this work. The development of diagnostic tools more adapted to these children to allow a better assessment of their clinical profiles is required. Finally, qualitative research seems indispensable to better identify the representations or counter-transferential issues of the adults surrounding the children. Research in the social and human sciences is needed to refine our knowledge of how children are raised in the area and the specificities of those families who have chosen jihad. Publications exist on individual destinies (30) but do not yet focus on families and how they function.

CONCLUSION

The purpose of follow-up, beyond diagnosing and treating disorders, is to attempt to restore meaning and connection in the beginning of a fragmented life. For the narrative to be structuring, it must integrate ambivalence and nuance.

Networking with partners (social services, justice, etc.) gradually allows us to try to build a coherent narrative in order to reinforce the narrative identity (17) of these children. The scotomas of their lives, their past in the war area, must not be the breeding ground for stigmatization. Obviously, these children are not responsible for their past; their future is open.

DATA AVAILABILITY STATEMENT

All datasets generated for this study are included in the article/supplementary material.

AUTHOR CONTRIBUTIONS

AK, AlM, MV-M, MF, MC, and FG collected the data. AK and TB designed and directed the project. AK wrote the manuscript with support from AlM, MV-M, FG, JL-B, MF, MC, AnM, JP, SP, and HL-P and under the supervision of DR, TB, MS, and J-MB. All authors discussed the results and approved the final manuscript.

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Effectiveness of a School-Based Intervention on the Students' Mental Health After Exposure to War-Related Trauma

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Background: After the war, which was conducted against Palestinian civilians in the Gaza Strip, the prevalence of posttraumatic stress disorder (PTSD) among children and adolescents has increased. The counselling department at the Ministry of Education in the Gaza Strip applied a counselling program in schools in order to alleviate the effect of exposure to war. The aim of the study is to investigate the effectiveness of the counselling program after exposure to war-traumatic events among Palestinian children and adolescents in the Gaza Strip.

Methods: The sample consists of 572 students aged 12–18 years old. Of them, 331 (57.9%) were female and 241 (42.1%) were male. Traumatic events were measured by *War-Traumatic Events Checklist (W-TECh)*. PTSD was measured by the *Post-Traumatic Stress Disorders Symptoms Scale (PTSDSS).* Anxiety symptoms were adapted from *The Anxiety Symptoms Scale*, and depression symptoms were measured by *Child Depression Inventory*. Repeated measures design was employed as the counselling program was applied in all the schools at the same time. Specifically, the data were collected from the participants before the application of the counselling program and 2 months later.

Results: After applying the school-based counselling program, the prevalence of PTSD (according to DSM-V) decreased from 57.5% to 45.6% among the children and adolescents who were exposed to war-traumatic events. In addition, PTSD symptoms, and emotional, somatic and cognitive functional impairment symptoms has decreased after the implementation of the counselling program especially amongst girls.

Conclusions: The school-based counselling program was effective in decreasing the PTSD symptoms among children and adolescents after the exposure to war-traumatic events.

Keywords: war-traumatic events, posttraumatic stress disorder, counselling program, children, adolescents, Palestine

INTRODUCTION

More than 1 billion children under the age of 18 live in armed conflict areas (1). These conflicts occur mainly in lower- and middle-income countries, where 90% of the world's population of children and adolescents live (2). In this regard, children may have a sense of insecurity and altered daily functioning after they have been exposed to war-traumatic events (3). Children and adolescents growing up with political violence and terrorism are vulnerable to intense psychological effects (4–6), which lead to psychiatric symptomatology (7, 8). The psychiatric symptomatology varied according to the context of war that the children live in, cultural specific psychiatric symptoms, the type of the trauma, the number of ongoing traumatic and stressful events that the child has experienced, and the impact of the traumatic event on the children's mental health (9–12).

Most current research is focused on school-based programs in order to reduce symptoms and enhance resilience among children and adolescents exposed to traumatic events, whether they have clinical symptoms or not (13). The school-based programs have several advantages: They are highly accessible, an effective form for alleviating psychological distress, non-stigmatizing, and associated with positive change on the students' lives (14, 15). Moreover, attending counselling programs in schools has a positive impact on the studying and learning of the students in secondary schools (16). In addition, those who are attending school-based counselling have revealed improvements in attendance and behavior (17).

Several studies have investigated the factors that protected the children living in the war-related context through a socioecological model. These protective factors may act at several layers such as household, school, and community (18, 19). Therefore, schools are suitable context in which intervention can be performed for children who have been exposed to traumatic events. In the socioecological model, parents, teachers, and mental health practitioners take part in the intervention. As a result, children may be helped to improve their mental health resilience during and after exposure to war-related trauma (20).

School-based psychosocial structured activities, which include play therapy, drama, and movement activities, were found to enhance the wellbeing of children who were affected by conflict in Northern Uganda (21). Furthermore, Loughry et al. (22) found that structural activities such as drama, art, and puppetry had a positive impact on Palestinian children's emotional and behavioral wellbeing at the time of political conflict.

The most recent systematic review study by Jordans and colleagues (2) was aimed at assessing the developments in interventions for conflict-affected children from 2009 to 2015. The majority of interventions are group interventions, either school-based or community-based. Furthermore, 90% of the intervention programs are implemented by paraprofessionals (e.g., teachers, social workers), with 95% receiving training for the intervention. However, only 43% of the various intervention programs studied showed positive overall promotion, prevention, and/or curative effects in terms of reducing symptoms and enhancing wellbeing (2). In another systematic review of psychosocial interventions, the researchers state that there has been a paucity of rigorous studies, because the publications mainly focus on posttraumatic stress disorder (PTSD) as the outcome of the intervention and the outcome evaluation (23).

Context of the Study

In the last war against the Gaza Strip in August 2014, Israeli forces utilized air forces, rockets, and explosive weapons in the attack. Around 2,216 Palestinians were killed, of whom 1,543 were civilians, and 10,895 were injured. In addition, 8,377 houses were completely demolished, and 23,597 houses were partially destroyed. Furthermore, more than 520,000 people were displaced (24). As a result, the consequences of exposure to war-trauma were severe. Approximately 425,000 children were in need of psychosocial support; many of them needed focused counselling sessions (25). Accordingly, the counselling department of the Ministry of Education in Gaza designed a psychosocial support program.

The intervention was performed in schools and conducted following the socioecological paradigm. The intervention activities were similar for all age groups, and the number of students in each group ranged between 4 and 10 according to the type of the activity of the group. The activities have been chosen by the counsellor and the children participated in all the activities. Therefore, there is no chance for researcher bias. Those who carried out the activities including teachers, social workers, and counsellors attended a 1-week training before the start of the school. Professional counsellors from the Counselling Department at the Ministry of Education in the Gaza Strip trained them on psychosocial support program, while parents received exact and detailed instructions about the counselling program.

The short psychosocial support program was carried out over 1 week (five continuous days, 4 h per day). It consisted of specific cognitive behavioral techniques, including psychoeducation and speaking about past traumatic experiences along with the group, expressive elements, such as structural movements (e.g., physical exercises), cooperative games, and drama (see **Table 1**). The general aim of the intervention is to assist the students to stabilize themselves and feel safe as reasonably possible in the existing difficult circumstances. The intervention aims to reduce the level of specific psychological symptoms among children who are exposed to ongoing war trauma and accordingly improve the level of functioning.

The aim of the current study is to investigate the effectiveness of the psychosocial support counselling program with children who were exposed to war trauma. To the best of our knowledge, this is the first study investigating the effectiveness of this program, which was applied immediately after the 2014 war on children who experienced continuous exposure to war trauma. The research questions of this study are as follows:

Has the psychosocial support counselling program had a positive effect in reducing the symptoms of exposure to war trauma?

TABLE 1 | Psychosocial Support Program Activities.

	Activities
Day 1	- Welcoming the students and their parents and providing psychosocial support at the morning line through the school radio (psychoeducation about trauma exposure, symptoms, and consequences was provided through this activity). - Survey of traumatized and injured students (full explanation about the survey and the aim of it was provided by the counsellors). - Storytelling activity from students and parents. The aim of this activity is to let the students and their parents to express their feelings and emotions about the traumatic event.
Day 2	- Providing extracurricular activities and strengthening religious and positive attitudes and values. These can play a significant role in decreasing the effect of exposure to traumatic events. - Provision of free drawing activity for students followed by discussion of their feelings about their drawings. - Establishment of students' committees for volunteering works in each class.
Day 3	- Providing extracurricular activities and strengthening positive attitudes and values. - Providing physical activities. - Applying psychodrama and role play activities (parents actively participated in these activities). - Volunteer work activities with students, teachers, parents, and social workers (e.g., visiting injured people in hospitals, families of those who have lost loved ones in the war).
Day 4	- Open meetings for parents, teachers, counsellors, headteachers, and social workers with local organizations working on social issues. Survey of severely traumatized cases. - Variety of activities (quizzes, poems, art activities).
Day 5	- Conclusion of the activities: open-day exhibit displaying students' art works.

Are there any differences in the effectiveness of the psychosocial support counselling program related to age or gender?

METHOD

Participants

The sample consisted of 572 students aged 12–18 years old (M = 14.37, SD = 1.28). Of these, 331 (57.9%) were female and 241 (42.1%) were male. The entire sample attended a psychosocial support counselling program led by trained school counsellors, social workers, and teachers. The participants were recruited from government schools in the Gaza Strip.

Design and Sampling

This study is a longitudinal pretest and posttest experimental design (single subject design).

The Gaza Strip, where the study was conducted, consists of five governorates (Rafah, Khan Younis, Middle Area, Gaza, and North Gaza), which are referred to as places of residence. Stratified random sampling was used to choose the participants according to place of residence, type of school (primary or secondary), and gender. Primary schools include students from year 1 to year 9, while secondary schools include those from year 10 to year 12. From each place of residence, two types of schools (one primary and one secondary) were randomly chosen. From these schools, one boy school and one girl school were randomly chosen, with one class from each school being selected. Hence, 30 classes (10 classes from year 7, 10 classes from year 8, and 10 classes from year 10) were chosen on the basis of five boy classes and 5 girl classes from each year. Hence, the total number of classes was 30 (5 [place of residence] * 3 [year 7, year 8, and year 10] * 2 [male and female]).

Ethical Procedure

Children and adolescents were given information sheets about the study and a parental consent form to give to their parents. Ethical approval was gained from the Ministry of Education in the Gaza Strip and the ethical committee at Kingston University London, UK.

Data Collection

In order to collect the data, 30 social workers and school counsellors were trained by the researcher to carry out the study instruments with the children and adolescents in the chosen schools. After obtaining consent forms from parents, teachers, headmasters, and the Ministry of Education, the social workers and school counsellors went to the schools and administered the questionnaires to the selected students, after getting consent from the students themselves. The social workers and school counsellors explained the nature of the study, its purpose, and how the students could respond to the questionnaires. Self-reported questionnaires and interviews were utilized to collect data from the participants. The participants completed the questionnaires in two separate sessions, with each lasting approximately 40 min. The data were collected in September 2014, 1 month after the 51-day war that was conducted against the people in the Gaza Strip (pre-intervention) and 2 months after the intervention (3 months after the war).

Study Instruments

Interviews with children and adolescents were conducted in schools to collect the data.

Demographic variables included age (12–18 years old), which was categorized into three groups [(1) youngest age group, less than 13 years old; (2) middle age group, 13–14 years old; and (3) oldest age group, 15 years old or more]; gender (male, female); family order (the first, the middle, the last); family size (below or above six members, being the average household size in the Gaza Strip) (26); type of residence (city, camp, village); parents' education (no school education, school education, higher education); parents' job (employed, unemployed); citizenship (refugee, not refugee); whether parents are alive or dead; and family income (below or above US $600, as the poverty line in Palestine for a household with five members is US $600) (26).

War-Traumatic Events Checklist (W-TECh): (27–29): Some of the items were adapted from Gaza Traumatic Events Checklist (30), the Trauma Questionnaire Scale (31), the Gaza Traumatic Events Checklist (32), and the Checklists of Traumatic

Experiences (33). The measure was modified to include items that reflected the last traumatic war events that happened in the Gaza Strip. The W-TECh consists of 30 items that cover war-traumatic experiences, including human traumatic losses or injuries and home demolition to adapt it to the nature of the last war. The items about home demolition that occurred in the last war in 2014 were as follows: Have you seen your neighbors' house destroyed by shelling or bulldozing? Have you seen other buildings destroyed by shelling or bulldozing? The W-TECh is divided into three categories: (1) experiencing personal trauma, in which children or adolescents are the target of war-related traumas, such as being shot or injured with live ammunition; (2) witnessing human trauma, in which children or adolescents witnessed others (e.g., family member, friend, or neighbor) being shot and/or injured during the war; and (3) seeing the demolition of property, in which children or adolescents observe the demolition of their home, school, and/or farm during the war. A pilot study was conducted to ensure the validity and reliability of the W-TECh. The results reveal that there is a significant correlation between the exposure to personal trauma items and the total domain (r = .269 to.524, P < .01), the witnessing trauma to others items and the total domain (r = .244 to.804, P < .01), and the seeing property demolition items and the total domain (r = .265 to 768, p < .01). Internal consistency reliability tests were run on the domains of W-TECh and the total scale. The personal domain consisted of 12 items (Cronbach's alpha = .646), the witnessing trauma to others domain consisted of 10 items (Cronbach's alpha = .767), the seeing properties demolition domain consisted of 8 items (Cronbach's alpha = .614), and the total scale consisted of 30 items (Cronbach's alpha = .830). As a result, the scale exhibited very good reliability and could be used in the study. Children and adolescents respond to the W-TECh by indicating whether they have experienced the traumatic event or not.

Post-Traumatic Stress Disorders Symptoms Scale (PTSDSS) adapted from 33): This scale consists of 50 items and was modified to include the diagnostic criteria of PTSD according to DSM-V, which include intrusion symptoms, avoidance, negative alterations in cognitions and mood, as well as alterations in arousal and reactivity. Functional impairment is also measured and includes items related to somatic symptoms (e.g., I get tired easily), cognitive symptoms (e.g., I cannot stop thinking about the traumatic event that I was exposed to), emotional symptoms (e.g., I get tense and nervous easily without good reason), social symptoms (e.g., I like to break the rules of my family or school), and academic dysfunction symptoms (e.g., I cannot concentrate on my studies). Children and adolescents rated their experiences on a five-point Likert scale (very often, often, moderately, rarely, or never).

Participants are considered to have PTSD when they a) have been exposed to at least one traumatic event as measured by the W-TECh; b) score moderately to very often on symptoms of at least one intrusion symptom, at least one avoidance symptom, at least two negative alterations in cognition and mood symptoms, and at least two symptoms related to alterations in arousal and reactivity; c) show significant alteration in functional impairment; and d) the duration of symptoms is more than 1 month (34). The reliability Cronbach's alpha of this measure is .94.

The anxiety symptoms scale (35): This is a brief self-report scale assessing generalized anxiety disorder (GAD-7). The participants completed the questionnaire by ticking the box that reflected their responses on a four-point Likert-type scale, as nearly every day = 3, more than half the days = 2, several days = 1, and not at all = 0. GAD-7 average severity interpretation: 0–4 none–minimal, 5–9 mild, 10–14 moderate, 15–21 severe. Cronbach's alpha for the anxiety scale was very good at .83.

Child Depression Inventory (36): This is based on the shorter version, which included 10 items, with an additional one on harming the self-included after the piloting, and each item consists of three sentences as responses. For example, the item "feeling of sadness" is represented by three sentences: I am sad once in a while; I am sad many times; and I am sad all the time. The participants responded by choosing one of the three sentences for all 11 items. The Cronbach's alpha is .801.

Statistical Analysis

A *T*-test was used to investigate the differences between two variables (e.g., male and female) and one-way ANOVA was used to examine the differences among three or more variables (e.g., type of residence: city, camp, or village). Mixed-design repeated measures ANOVA was used with a within-subjects factor of time, i.e., pre- vs. post-intervention, for the between-subject factors of gender (male vs. female) and covariate of age (youngest age group vs. middle age group vs. oldest age group) in order to investigate the differences in the effects of the counselling program. In order to determine the effect size, the guideline interpretation of Hedge's *g* (37) was utilized, where a small effect size is considered as being 0.20, a medium effect size is 0.50, and a large effect size is 0.80 or more.

RESULTS

Prevalence of the Exposure to War-Traumatic Events, PTSD, and Functional Impairments

The results show that almost every child or adolescent (99.1%, $N = 567$) had experienced at least one war-traumatic event ($M = 11.32$, $SD = 5.25$). The most prevalent war-traumatic events were witnessing or hearing shelling by tanks, artillery, or military planes (89.3%, $N = 511$); witnessing the signs of shelling on the ground (83.4%, $N = 477$); witnessing neighbors' houses being destroyed (69.2%, $N = 396$); witnessing the injury or killing of someone by the occupying forces (66.4%, $N = 380$); and witnessing a friend, a neighbor, or a close relative being killed by the occupying forces (62.8%, $N = 359$). The least prevalent war traumatic events were shooting with live ammunition by the occupying forces (4.2%, $N = 24$); being beaten by the occupying forces (5.2%, ($N = 30$); witnessing one's house being destroyed completely (7.9%, $N = 45$); being injured (e.g., wounds, burns, or

bone breaking) by shelling, tanks, artillery, or military planes (9.1%, N = 53); and being injured to the degree that one lost consciousness (9.3%, N = 53). The war-traumatic events were divided into three categories and the results reveal that about 97.6% (N = 585) had experienced personal trauma, 92.2% (N = 525) had witnessed trauma to others, and 96.9% (N = 554) had seen the demolition of property during the war (see **Table 2**).

Of the entire sample, 57.5% (N = 329) met the PTSD criteria of DSM-V 1 month after the war in 2014; 89.2% (N = 510) had re-experience symptoms; 63.1% (N = 361) had avoidance symptoms; 90% (N = 515) had negative alterations in cognition and mood; and 78.1% (N = 447) had alterations in arousal and reactivity. Moreover, about 45.8% (N = 262) reported moderate to severe somatic symptoms; 75.5% (N = 432) reported moderate to severe cognitive symptoms; 72.1% (N = 412) reported moderate to severe emotional symptoms; 56.4% (N = 323) reported moderate to severe social symptoms; and 52.1% (N = 298) reported symptoms of moderate to severe academic dysfunction.

TABLE 2 | War Traumatic Events Frequency.

No.	Items	N	%
1.	Has your house been destroyed completely by shelling or bulldozing?	45	7.9
2.	Has your house been destroyed partially by shelling or bulldozing?	149	26
3.	Have you seen your neighbors' house destroyed by shelling or bulldozing?	396	69.2
4.	Have you seen other buildings destroyed by shelling or bulldozing?	298	52.1
5.	Have you been shot with live ammunition by occupied forces?	24	4.2
6.	Have you been injured (e.g., wounds, burns, or bone break) by shelling, tanks, artillery, or military planes?	52	9.1
7.	Have you been injured to the degree that you lost consciousness?	53	9.3
8.	Have you been exposed to live fire by occupied forces, but you were not injured?	73	12.8
9.	Have you been beaten by occupied forces?	30	5.2
10.	Have you been exposed to shelling by tanks, artillery, or military planes, but you were not injured?	291	50.9
11.	Have the occupied forces sieged your house, block, camp, or zone?	81	14.2
12.	Has someone of your family members been killed by occupied forces?	72	12.6
13.	Has someone of your friends, neighbors, or close relatives been killed by occupied forces?	359	62.8
14.	Has someone of your family members been injured by occupied forces?	113	19.8
15.	Has someone of your friends, neighbors, or close relatives been injured by occupied forces?	305	53.3
16.	Have you attended to martyr's funeral?	215	37.6
17.	Have you been forced to leave your home during the war?	319	55.8
18.	Have you been detained at home during incursion?	244	42.7
19.	Have you been threatened to death by being used as human shield to arrest your neighbors by the army?	60	10.5
20.	Have you witnessed the occupied forces destroying house(s)?	322	56.3
21.	Have you witnessed or heard shelling by tanks, artillery, or military planes?	511	89.3
22.	Have you witnessed or heard the occupied forces opening fire against people?	199	34.8
23.	Have you witnessed the occupied forces beating someone?	183	32
24.	Have you witnessed killing or injuring someone by the occupied forces?	380	66.4
25.	Have you witnessed arresting someone by the occupied forces?	145	25.3
26.	Have you witnessed the occupied forces destroying trees and farms?	222	38.8
27.	Have you witnessed the occupied forces not allow ambulance access to hospital?	273	47.7
28.	Have you witnessed the signs of shelling on the ground?	477	83.4
29.	Have you watched mutilated bodies?	343	60
30.	Have you witnessed assassination of people by rockets?	246	43

Demographic Variables With Exposure to War-Traumatic Events

The relationship of various factors with exposure to traumatic war events was investigated. One-way ANOVA tests indicate that the effect of age [$F(2,424) = 5.81$, $p = .003$, $\eta_p^2 = .027$], gender [$t(570) = 8.915$, $p < .001$, $d = .751$], father's education level [$F(2,561) = 6.39$, $p = .002$, $\eta_p^2 = .022$], mother's education level [$F(2,562) = 9.16$, $p < .001$, $\eta_p^2 = .032$], and father's employment [$t(566) = 1.97$, $p = .04$, $d = .165$] were significant. Bonferroni *post hoc* tests show that the oldest age group had more exposure to war-traumatic events than the middle age group ($p = .005$). Also, boys exhibited greater exposure to war-traumatic events than girls ($p < .001$). In addition, children and adolescents whose fathers ($p = .001$) and mothers ($p < .001$) had no school education were exposed to more war-traumatic events than those whose parents had school education. Moreover, children and adolescents whose mothers had no school education were exposed to more war-traumatic events than those whose mothers had higher education ($p = .01$). Finally, children and adolescents whose fathers were unemployed reported more exposure to war-traumatic events compared to those whose fathers were employed ($p < .04$) (see **Table 3**).

Mental Health Diagnosis Over Time by Gender, Age and Time (Pre–Post-Intervention)

PTSD

Mixed ANOVA analyses show a significant effect of time on PTSD diagnosis, according to DSM-V [$\chi^2(1, N = 513) = 77.63$, $p < .001$]. The prevalence of children and adolescents who met the diagnostic criteria of PTSD reduced from 57.5% pre-intervention to 45.6% post-intervention. Mixed ANOVA analyses reveal a significant effect of time on PTSD symptoms [$F(1, 511) = 15.04$, $p < .001$, $\eta_p^2 = .03$]; re-experience cluster symptoms [$F(1, 511) = 12.65$, $p < .001$, $\eta_p^2 = .024$]; negative alterations in cognition and mood cluster symptoms [$F(1, 511) = 4.35$, $p = .03$, $\eta_p^2 = .008$]; somatic symptoms [$F(1, 511) = 13.72$, $p < .001$, $\eta_p^2 = .026$]; cognitive symptoms [$F(1, 511) = 42.53$, $p < .001$, $\eta_p^2 = .077$]; emotional symptoms [$F(1, 506) = 30.00$, $p < .001$, $\eta_p^2 = .056$]; and academic dysfunction symptoms [$F(1, 505) = 5.37$, $p = .02$, $\eta_p^2 = .011$]. Children and adolescents reported fewer PTSD symptoms, re-experience cluster symptoms, negative alterations in cognition and mood cluster symptoms, somatic symptoms, as well as cognitive, emotional, and academic dysfunction symptoms after the intervention compared to before. In contrast, mixed ANOVA analyses show no significance regarding time for avoidance cluster symptoms

TABLE 3 | Demographic Variables Frequencies.

	N	%	Total trauma M (SD)
Age			$p = .003$
12 or less	11	1.9	9.36 (3.95)
13–14	344	60.1	11.01 (5.33)
15 or more	197	34.4	13.18 (5.13)
Gender			$p < .001$
Male	241	42.1	13.48 (5.11)
Female	331	57.9	8.20 (4.87)
Family size			$p = .23$
Below average	61	10.7	10.47 (5.14)
Above average	460	80.4	11.31 (5.20)
Type of residence			$p = .16$
City	397	69.4	11.34 (5.29)
Refugee camp	103	18	11.40 (4.86)
Village	59	10.3	10.00 (5.07)
Family income			$p = .17$
Below average	413	72.2	11.39 (5.08)
Above average	111	19.4	10.64 (5.40)
Father education			$p = .002$
None	110	19.2	12.82 (5.23)
School education	305	53.3	10.75 (4.96)
Higher education	149	26	11.35 (5.69)
Father job			$p = .04$
Unemployed	274	47.9	11.74 (5.45)
Employed	294	51.4	10.87 (5.03)
Father			$p = .31$
Alive	543	94.9	11.26 (5.22)
Dead	22	3.8	12.40 (6.20)
Mother education			$p < .001$
None	98	17.1	13.30 (4.96)
School education	366	64	10.78 (5.15)
Higher education	101	17.7	11.26 (5.48)
Mother job			$p = .15$
Unemployed	531	92.8	11.22 (5.16)
Employed	36	6.3	12.50 (6.42)
Mother			$p = .68$
Alive	550	96.2	11.27 (5.23)
Dead	22	2.4	11.85 (4.46)
Citizenship			$p = .48$
Refugee	141	24.7	11.03 (4.66)
Not refugee	416	72.7	11.38 (5.38)

($p = .13$), alterations in arousal and reactivity cluster symptoms ($p = .99$), and social symptoms ($p = .21$) (see **Table 4**).

Mixed ANOVA analyses show a significant effect of *gender* on PTSD [$F(1, 511) = 10.40$, $p = .001$, $\eta_p^2 = .020$]; re-experience cluster symptoms [$F(1, 511) = 43.31$, $p < .001$, $\eta_p^2 = .078$]; avoidance cluster symptoms [$F(1, 506) = 6.55$, $p = .01$, $\eta_p^2 = .013$]; somatic symptoms [$F(1, 511) = 5.13$, $p = .02$, $\eta_p^2 = 010$]; cognitive symptoms [$F(1, 511) = 15.51$, $p < .001$, $\eta_p^2 = 029$]; emotional symptoms [$F(1, 506) = 57.08$, $p < .001$, $\eta_p^2 = .10$]; and academic dysfunction symptoms [$F(1, 505) = 7.61$, $p = .006$, $\eta_p^2 = .015$]. Specifically, girls reported fewer PTSD symptoms, re-experience cluster symptoms, avoidance cluster symptoms, somatic symptoms, and cognitive and emotional symptoms than boys. On the other hand, boys reported more academic dysfunction symptoms after the intervention when compared to before. Moreover, the results show no effect of gender in terms of negative alterations in cognition and mood cluster symptoms ($p = .72$), alterations in arousal and reactivity cluster symptoms ($p = .69$), and social symptoms ($p = .89$) (see **Table 4**).

Mixed ANOVA analyses show a significant effect of *age* on academic dysfunction symptoms [$F(2, 494) = 3.37$, $p = .03$, $\eta_p^2 = .013$]. A Bonferroni *post hoc* test shows that the oldest age group reported less academic dysfunction symptoms than the middle age group ($p = .07$). In contrast, mixed ANOVA analyses display no significant effect of age regarding PTSD ($p = .40$), re-experience cluster symptoms ($p = .14$), avoidance cluster symptoms ($p = .30$), negative alterations in cognition and mood cluster symptoms ($p = .18$), alterations in arousal and reactivity cluster symptoms ($p = .15$), somatic symptoms (p .99), cognitive symptoms ($p = .07$), emotional symptoms ($p = .20$), or social symptoms ($p = .79$).

Mixed ANOVA analyses show no significant age × gender interaction for PTSD ($p = .89$); re-experience cluster symptoms ($p = .69$); avoidance cluster symptoms ($p = .98$); negative alterations in cognition and mood cluster symptoms ($p = .63$); alterations in arousal and reactivity cluster symptoms ($p = .93$); somatic symptoms ($p = .74$); cognitive symptoms ($p = .90$);

TABLE 4 | Means and Standard Deviations of PTSD, PTSD Clusters, Anxiety, Depression, and Functional Impairment Regarding Gender Pre- and Post-intervention.

	N (M, F)	Pre-intervention			Post-intervention		
		Male M (SD)	Female M (SD)	Total M (SD)	Male M (SD)	Female M (SD)	Total M (SD)
PTSD (total)	513(197, 316)	46.52(25.07)	54.99(25.24)	51.74(25.49)	44.65(24.33)	49.35(24.73)	47.55(24.66)
Re-experience	513(197, 316)	2.83(1.98)	4.06(1.77)	3.59(1.95)	2.75(2.15)	3.54(1.87)	3.24(2.02)
Avoidance	508(194, 314)	0.86(0.84)	1.06(0.85)	0.98(0.85)	0.83(.84)	0.96(0.88)	0.91(0.87)
Negative alterations in cogitations and mood	513(197, 316)	6.18(3.52)	6.66(3.57)	6.47(3.55)	6.24(3.78)	5.97(3.64)	6.07(3.69)
Alterations in arousal and reactivity	513(197, 316)	3.77(2.70)	3.93(2.51)	3.87(2.58)	4.02(2.97)	3.68(2.70)	3.81(2.80)
Somatic symptoms	513(197, 316)	11.01(7.45)	13.61(7.82)	12.61(7.78)	11.07(7.77)	11.21(6.98)	11.15(7.29)
Cognitive symptoms	513(197, 316)	19.10(9.78)	23.13(10.37)	21.58(10.32)	17.37(9.16)	19.60(9.64)	18.74(9.51)
Emotional symptoms	508(193, 315)	16.01(8.16)	22.18(8.75)	19.83(9.04)	14.91(8.27)	19.22(8.87)	17.58(8.89)
Social symptoms	509(194, 315)	16.56(11.53)	17.40(11.71)	17.08(11.64)	16.93(11.83)	15.83(11.23)	16.25(11.46)
Academic dysfunction symptoms	507(192, 315)	12.35(8.55)	10.49(8.57)	11.20(8.60)	13.28(8.64)	11.28(8.70)	12.04(8.72)
Anxiety	501(186, 315)	5.98(4.14)	6.73(4.70)	6.45(4.51)	6.10(4.28)	6.30(4.38)	6.23(4.34)
Depression	495(183, 312)	5.80(3.71)	5.67(3.51)	5.72(3.59)	6.49(3.98)	5.81(3.99)	6.06(3.99)

emotional symptoms (p = .59); social symptoms (p = .86); or academic dysfunction symptoms (p = .24).

Anxiety

The results show that the level of anxiety was mild before the intervention (M = 6.45) and after the intervention (M = 6.32). The results also show that there is no significant effect of time (p = .51); gender (p = .18); or gender × age interaction (p = .24) on the level of anxiety before and after the intervention (see **Table 4**).

Depression

Mixed ANOVA analyses show a significant effect of time on depression [$F(1, 493) = 5.47$, p = .02, η_p^2 = .011]. Children and adolescents reported more depression symptoms after the intervention compared to before the intervention. In contrast, the results show no effect of gender (p = .19), age (p = .23), or gender × age interaction (p = .42) on the level of depression before and after the intervention (see **Table 4**).

DISCUSSION

The present study was aimed at investigating the effectiveness of a short-term school-based psychosocial counselling program on the mental health of children and adolescents. The study was conducted immediately after the war that took place in July 2014 in the Gaza Strip. This is the third major war that the children experienced during the last 6 years. As a result, they have been more likely to develop mental health problems. Professionals working in the Counselling Department at the Ministry of Education in the Gaza Strip implemented a short-term school-based psychosocial counselling program for all students after the war. Parents, teachers, counsellors, and social workers have been involved and participated in the intervention. The intervention started in the first week of the academic year and was aimed at mitigating the effect of exposure to war-related traumatic events by reducing PTSD symptoms. It included specific strategies (e.g., psychoeducation, psychodrama, role play, storytelling, and free drawing) that have shown positive effects on children's wellbeing.

Previous results have shown that psychoeducation strategies (information has been given to the children about the traumatic events) assist children in restructuring themselves and having a sense of control, thereby being able to recover faster (21, 22, 38). Moreover, drama games exercises have been found to be beneficial for trauma recovery in terms of improving feelings of dysregulation and social isolation as well as enhancing the sense of power, which can be very helpful toward the recovery process after trauma exposure (38). In addition, it has been elicited that using a free drawing strategy enables children to identify the social support that they need after exposure to such an event (39). Furthermore, cooperative games, such as psychodrama, facilitate children promoting cohesion within groups and fostering cooperation (21, 22). Finally, in the intervention, the children applied the storytelling strategy, which pertains to speaking about what has disturbed them about the traumatic experience, which can let them feel better after doing so (38).

The results indicate that almost every child or adolescent had been exposed to at least one war-traumatic event. Consequently, the prevalence of exposure to each category of the war-traumatic checklist (experiencing personal trauma, witnessing trauma to others, and seeing properties demolition) was very high; at least 92.2% of the children experienced all the types of exposure. Moreover, 57.5% of the children met the diagnostic criteria of PTSD according to DSM-V. These findings are in line with previous studies, thus indicating that the greater the exposure to traumatic events, the greater the possibility of developing PTSD symptoms and diagnosis (8, 33, 40). Also, consistent with previous studies (41, 42), the results show that exposure to war-traumatic events causes functional impairment, such as cognitive, emotional, and/or social symptoms.

The results revealed that boys reported more exposure to war-traumatic events than girls. In the Palestinian culture, boys are urged to take part in the political activities (43), and accordingly, they are more liable to be exposed to traumatic events. This is in line with previous studies (44–46). Furthermore, older children reported more exposure to war-traumatic events than younger ones. Culturally, children in Palestine think that the participation in the community activities is one of their responsibilities, the sense of which increases as they get older. Accordingly, their participation in the community activities during the war increased, and hence, they became more vulnerable to being exposed to war-traumatic events.

Further, girls exhibited greater improvement in PTSD symptoms over time after the intervention, a finding in line with previous studies (47, 48). However, this differs from Qouta et al. (49), who elicited that school-based intervention had a more positive impact on boys when compared to girls. With regards to functional impairment, girls reported lower somatic symptoms, and cognitive and emotional symptoms compared to boys, while the latter reported more academic dysfunction symptoms than the former.

According to the ecological developmental theory, children's mental health is affected by their characteristics and the social context, including the family, peer, school, and the community levels. That is, these factors interact to shape the children's personality and behavior (50, 51) and play a critical role in their development (50, 52–55). Therefore, social context appears to be crucial in the implementation of the intervention for the children who develop PTSD. Consequently, positive effects from intervention can be achieved if traumatized children have a supportive environment (39). Based on the ecological theory, one of the main aims of the intervention was to include parents and teachers in its activities, which contributed positively to the children's mental health during and after the application of the activities. That is, many children reported improvement in their mental health after the application of the intervention. This also can be achieved by including organizations and centers that provide psychosocial intervention programs for students in schools and individually for those who report severe mental disorders. Future studies should also take into account employment status, educational level, time spent with children, and parental support.

Brunzell et al. (56) suggested a Trauma-Informed Positive Education (TIPE) model to deal with traumatized students. The model focuses on both defect perspective such as developmental struggles that students suffer from and strengths perspective such as psychological resources that students have to success. It is proposed that three domains are needed for traumatized children: repairing regular abilities, repairing disrupted attachment, and empowering psychological resources. In the current study, teachers were involved in the intervention program, and they have trained in some counseling activities to implement with the students. So, they can help the students who are still struggling in schools.

The results also showed that there is no significant effect of time, gender, and gender/age interaction on the level of anxiety before and after the intervention, while for depression, there was only a significant effect for time; depression increased after the intervention. These results are in line with previous studies [e.g., (57)], which indicated that classroom-based intervention has low effect in reducing anxiety and depressive symptoms. Therefore, a focused attention should be given to providing a different kind of psychosocial support for these disorders. International consensus guidelines [e.g., the Inter-Agency Standing Committee (IASC)] regarding mental health and psychological support in emergency situations agree on the necessity of a multilayered system of support delivered at various levels in the social and health systems. Moreover, they emphasize the importance of the integration of different kinds of support including: 1) activities for the population as a whole, such as providing general humanitarian support with respect to dignity; 2) nonspecialized activities that intensify protective factors for people who still need more individual or group intervention. The nonspecialized activities can be applied by trained and supervised workers (but who may not have had years of training in specialized care); and 3) intervention programs that address a smaller number of the population, who have revealed significant psychological distress or mental disorders that require more specialized support (58). These interventions should be focused more on specific disorders and symptoms such as anxiety and depression.

The study has several limitations. Firstly, the intervention was implemented for all students, so there is no control group to allow for any causal interpretation. Secondly, the post-intervention was performed only once for all students in all schools 2 months after the intervention, after which the students will go through final exams and then holidays. Thus, a longer follow-up period should be in place to measure the long-term effects of the intervention. Thirdly, the results show that anxiety did not reduce after the intervention, hence leaving a very fertile ground to the emergence of long-term discrete symptoms. Nevertheless, the study is of high importance to the understanding of relevant psychosocial activities in children and adolescents with PTSD, and more importantly, it sheds light to a warzone and a conflict context where studies are scarce. A future mixed method study (quantitative and qualitative) is needed to investigate in depth the effectiveness of this intervention. A qualitative-clinical interview study will prompt for more in-depth responses about the causes and consequences of war trauma and the benefits of particular aspects of the intervention that could help in specific PTSD criteria. Finally, the study depended on children's self-reporting, which can be a limiting factor and hence future studies should consider collecting data from other resources, such as parents and teachers. The Gaza Strip is in a severe deprivation of basic needs and is regularly exposed to continuous traumas and political instability. These aspects need to be taken into account in future studies. On the other hand, there is a need for proper diagnostic methods that suit the context of ongoing trauma and thus ongoing PTSD.

CONCLUSION

School-based intervention was tailored to decrease the psychological symptoms and improve resilience among children and adolescents who had been exposed to war trauma. It was also designed to provide social support for parents and teachers in order to bring back their routine lifestyle. The intervention included strategies such as storytelling, psychodrama, and role playing, which indicated a positive effect on reducing the prevalence of a PTSD symptoms and diagnosis, according to DSM-V classification.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding authors.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics committee of Kingston University London, UK. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

BE-K conceived of the study and its design, and coordinated and drafted the manuscript. MS conceived of the study and its design, and coordinated and drafted the manuscript. All authors read and approved the final manuscript.

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Traumatic Events and PTSD Among Palestinian Children and Adolescents: The Effect of Demographic and Socioeconomic Factors

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Background: The situation in the Gaza Strip is uncommon in the frequency with which children are exposed to war-related traumatic events on a daily basis and because of the long-term nature of the conflict. The prevalence of posttraumatic stress disorder (PTSD) among children and adolescents in the Gaza Strip increased after the recent wars. The aims of the study are: To investigate the prevalence and nature of war traumatic events and PTSD; and to investigate how these traumatic events predict PTSD when taking into account demographic and socioeconomic status factors amongst Palestinian children and adolescents in the Gaza Strip.

Methods: The sample consists of 1,029 school pupils (11–17 years old): 533 (51.8%) were female and 496 (48.2%) were male. War-Traumatic Events Checklist (W-TECh) Post-Traumatic Stress Disorders Symptoms Scale (PTSDSS) were used.

Results: The majority of children and adolescents experienced personal trauma (*N*: 909; 88.4%), witnessed trauma to others (*N*: 861; 83.7%) and observed demolition of property (*N*: 908; 88.3%) during the war. Compared to girls, boys showed significantly more exposure to all three event types as well as overall traumatic events. Results also demonstrated that the prevalence of DSM-V PTSD diagnosis was 53.5% (*N* = 549). Further, children who had experienced personal trauma, trauma to others, and the demolition of property were significantly more likely to be diagnosed with PTSD compared to those who had not, even when adjusting for demographic and socioeconomic factors. The strongest war trauma for PTSD is personal trauma followed by witnessing trauma and then observing demolition of properties.

Conclusions: The study provides valuable evidence that demographic and socioeconomic factors mediate the relationship between different war traumatic events and PTSD. Interventions should take into account the children's background including their gender, age, where they live, and their socioeconomic status (e.g., family income, parents' educational level, family size) to alleviate the psychological symptoms and to enhance their resilience.

Keywords: war traumatic events, Posttraumatic Stress Disorder, Palestinian, children, adolescents, socioeconomic status

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INTRODUCTION

A large number of children live in conditions of political violence, terrorist, and war situations worldwide (1). War-related stressors may include shelling, bombing, home demolition, and exposure to the wounding and killing of family members or loved ones (2). As a result, children may have feelings of unsafety and altered daily functioning when they are exposed to war-traumatic events (3). Moreover, children and adolescents growing up in situations of political violence and terrorism are vulnerable to damaging developmental consequences (4) and intense psychological effects (5–8); these, in turn, can lead to psychiatric symptomatology (7, 9–11).

Children do not develop in isolation, they both actively shape and are shaped by the social worlds in which they live. The ecological theory highlights the development of the child within his/her environment and the interaction emerged between the two of them. This interaction consists of a social network or a variety of contexts or ecologies that shape the child's personality and behaviors (12, 13) and play a major role in their development (12, 14–18). Beside the individual characteristics of the child (e.g., gender, age, family order), family (e.g., family size, socioeconomic status), and environment (e.g., war traumatic events) appear to be a primary context in order to understand the development of PTSD.

Several studies have revealed that exposure to previous traumatic war experiences and events is a risk factor for the development of post-traumatic stress disorder (PTSD), grief, and depression (21, 22). The exposure to traumatic events, specifically physical injuries, loss of loved ones, immediate risk of life (2, 23), injury of a family member or friend (2, 24–26) and losing a family member (27) are the strongest risk factors for PTSD.

Demographic characteristics such as age, gender, type of residence, and socioeconomic status have also been found to be related to PTSD. Findings for age have been varied, while several studies showed that older children exhibit more symptom of PTSD than younger children (e.g., 28), other studies have shown the opposite (e.g., 29) or even no difference (e.g., 30). A similar discrepancy is seen in results describing gender differences: Some studies report that females show more PTSD symptoms (e.g., 31) while others have either found that males exhibit more symptoms (5) or found no differences (e.g., 30). Children who live in cities report less PTSD than those in villages (30) and those with low socioeconomic status report more psychological distress including anxiety, depression, and PTSD (e.g., 5, 26). For adolescents, having an unemployed father is a risk factor for PTSD, anxiety, and depression compared to having a father in employment (28).

The situation in the Gaza Strip is uncommon in the frequency with which children are exposed to war-related traumatic events on a daily basis and because of the long-term nature of the conflict. Altawil et al., (32) found that every single child had been exposed to three or more traumatic events. In addition, 42% were suffering from moderate or acute PTSD levels. Another study showed that 54.7% of Palestinian children have been exposed to at least one traumatic event in their life. Of these, 49% have experienced a war-related trauma (5). Furthermore, the results of an assessment of the impact of war-trauma on adolescents in the Gaza Strip and South Lebanon by Khamis (26) indicated that around 30% of adolescents have been exposed to war traumatic events during their lives. Adolescents in the Gaza Strip showed more PTSD compared to the adolescents in south Lebanon.

Exposure to political violence and war in Palestine began with the 1948 war between the Jewish and the Arab armies. As a result of this war, many Palestinians were killed and their villages destroyed with half of Palestinians becoming refugees either in the West Bank or Gaza, or in Arab countries, such as Lebanon, Jordan and Syria. In 1967, the Israeli army further occupied the West Bank and the Gaza Strip. In December 1987, the first Palestinian uprising (Intifada) began and Palestinians in the occupied territories (the Gaza Strip and the West Bank) commenced a revolution against the Israeli occupation. The second uprising started in 2000 and more sophisticated weapons, such as tanks and airplanes, were used by the Israeli army. The number of people killed and wounded increased accordingly. Hence, the prevalence of PTSD and other mental health problems also increased (33). In December 2008, the Israeli army launched a war against the Gaza Strip, which was more severe than the first and second uprisings. Palestinians were attacked using rockets from the air, tanks on the ground, and military ships. This war continued for 22 days, and more than 1,400 Palestinians were killed with mass destruction of houses and farms (34).

Throughout the Israeli attacks against civilians on the Gaza Strip that took place from 14–26 November 2012, 175 civilians were killed. Of them, 59 were children and 11 were women. A further 1,399 civilian people were wounded, of them 606 were children and 254 were women (35). There are few studies on the effects of long-term exposure to war-traumatic events on the children and adolescents in the Gaza Strip (27). The current study provides a unique opportunity to investigate a large sample of children who have experienced a chronic war trauma over time in a conflict situation. The study aims to explore the prevalence of PTSD symptoms and diagnosis according to DSM-V among children and adolescents after the war conducted against civilians in the Gaza Strip in November 2012. Also, we aim to examine the different risk factors and consequences of PTSD in children and adolescents in the Gaza Strip and identify the high-risk groups for PTSD. We hypothesize that risk factors such as exposure to war-traumatic events, and demographic variables such as age, gender, type of residence, socioeconomic status may be related to PTSD among Palestinian children in the Gaza Strip.

METHODS

Participants and Procedures

Palestinian school children and adolescents (7^{th}, 8^{th}, and 10^{th} grade; N = 1,131) aged 11–17 years old (M = 13.71, SD = 1.36) were approached to participate in the study. All parents agreed that their children take part in the study. Of these, 102 students were absent at the time of data collection or transferred to another school. As a result, the total number of the sample was 1,029 students; 533 (51.8%) were female and 496 (48.2%) were

male. The participants were chosen according to place of residence (Rafah, Khan Younis, Middle Area, Gaza, or North Gaza), type of school (primary or secondary), and gender (male or female) using a stratified random sampling. From each place of residence, two types of schools (one primary and one secondary) were randomly chosen; then from these schools, one male school and one female school were randomly chosen, and then, one class from each single school was selected randomly. Finally, 30 classes, 10 classes from each grade (7^{th}, 8^{th}, and 10^{th} grades) were chosen on the basis of five male classes and five female classes. Thirty social workers and school counselors were fully trained by the researchers and performed the interviews with the children and adolescents in the chosen schools in the Gaza Strip. The data were collected in October 2013 one year after the Israeli attacks on Gaza which occurred between the periods 14^{th} to 26^{th} November 2012.

Ethical Procedure

Children were given an information sheet about the study and a parental consent form to give to their parents. Ethical approval was gained from the Ministry of Education in the Gaza Strip and from the ethical committee of the Faculty of Business and Social Sciences (FBSS) at Kingston University London.

Study Instruments

Data collection in the form of interviews with children and adolescents was conducted in schools. Two separate sessions were held; each of them lasted approximately 40 minutes.

Demographic variables included age (11–17 years), which was categorized to three groups: (1) youngest age group: 11–12 years, (2) middle age group: 13–14 years, and (3) oldest age group: 15 years or older; gender (male, female); family order (the first, the middle, the last sibling); family size (below or above six members) as the average house hold size in the Gaza Strip is six members (36); type of residence (city, camp, village); parents' education (have not attended any school education, school education, higher education (e.g., university)); parents' job (employed, unemployed); citizenship (refugee, not refugee); whether parents are alive or dead; and monthly family income (below or above US $600) (36).

War-Traumatic Events Checklist (W-TECh): The W-TECh was constructed by two of the authors (19; 20, 37). Some of the items were adapted from Gaza Traumatic Events Checklist (38) and the Trauma Questionnaire Scale (39). The measure was modified to include items that reflect the last traumatic war events that happened in the Gaza Strip. It consists of 28 items that cover war-traumatic experiences such as human traumatic losses or injuries and home demolition. To ensure that the answers are specific to the 2012 war, the data collectors asked the participants to answer the items based on their experiences during the 2012 war.

The W-TECh includes three categories: (1) experiencing personal trauma, in which children or adolescents were the target of war-related traumas such as being shot or injured with live ammunition; (2) witnessing human trauma, in which children or adolescents witnessed others (e.g., family member, friend, or neighbor) being shot and/or injured during the war; and (3) seeing demolition of property, in which children or adolescents observe the demolition of their home, school, and/or farm during the war. Children and adolescents responded to the W-TECh by indicating whether they experienced the traumatic event or not.

*Post-Traumatic Stress Disorders Symptoms Scale (PTSDSS) (*32): The scale consists of 50 items and has been modified to include the diagnostic criteria of PTSD according to DSM-5 (40), which includes intrusion symptoms, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. Functional impairment included items related to somatic symptoms (e.g., "I get tired easily") cognitive symptoms (e.g., "I cannot stop thinking about the traumatic event that I was exposed to"), emotional symptoms (e.g., "I get tense and nervous easily without good reason"), social symptoms (e.g., "I like to break the rules of my family or school"), and academic dysfunction symptoms (e.g., "I cannot concentrate on my study"). Children and adolescents rate their experiences on a 5-point Likert scale (*very often*, *often*, *moderately*, *few*, or *never*).

Participants were considered to have PTSD when they had a) been exposed to at least one war traumatic event as measured by the W-TECh; b) scored moderately to very often for at least one intrusion symptom, at least one avoidance symptom, at least two negative alterations in cognitions and mood symptoms, and at least two symptoms related to alterations in arousal and reactivity; c) significant alteration in functional impairment; and d) symptoms duration of more than 1 month (40).

Statistical Analysis

T-tests were used to investigate the difference between two variables (e.g., male and female), one-way ANOVA to examine the difference among three or more variables (e.g., type of residence: city, camp, or village), and chi-square analysis to investigate the difference between two or more categorized variables (e.g., type of residence and PTSDD). Pearson correlation coefficients analysis was performed to examine the association of war-traumatic events categories (exposure to personal trauma, witnessing trauma to others, and seeing demolition of properties) and PTSD criteria, and functional impairments. Furthermore, linear and logistic regression analyses were employed in order to examine the association between PTSD as the dependent (outcome) variable and demographic variables (e.g., age, gender) and traumatic events categories (exposure to personal trauma, witnessing trauma to others, and seeing demolition of properties) as the independent (predictor) variables.

RESULTS

Demographics Factors

The age of the participants was 11–17 years. Of them, 51.8% were females, and the family size ranged from 2 to 18 (M = 8.6, SD = 2.41). The majority of the participants are middle children in their families (64.5%), live in the city (67.2%), and the majority (94.7%) had their parents alive (see **Table 1**).

Prevalence of War Traumatic Events and PTSD

The results demonstrated that every child or adolescent has experienced at least one war-traumatic event (M = 9, SD = 4.8). The most prevalent war-traumatic events were witnessing or hearing shelling by tanks, artillery, or military planes (90.4%, N = 931); witnessing the signs of shelling on the ground (75%, N = 766); and witnessing the injury or killing of someone by the occupied forces (58.7%, N = 605). The least prevalent war traumatic events were shooting with live ammunition by the occupied forces (3%, N = 31), being injured (e.g., wounds, burns, or bone break) by shelling, tanks, artillery, or military planes (4%, N = 41); and being beaten by the occupied forces (5%, (N = 49). When looking at the categories of the traumatic events, the results revealed that about 88.3% (N = 909) experienced personal trauma, 83.7% (N = 861) witnessed trauma to others, and 88.2% (N = 908) had seen demolition of properties during the war (see **Table 2**).

Of the entire sample, 54% (N = 549) met the PTSD criteria of DSM-V; 87% (N = 896) had intrusion symptoms, 59.8% (N = 616) had avoidance symptoms, 86.2% (N = 888) had negative alterations in cognitions and mood, and 76.9% (N = 792) had alterations in arousal and reactivity. Moreover, about 46% (N = 468) suffered from moderate to severe somatic symptoms; 68.4% (N = 704) suffered from moderate to severe cognitive symptoms; 68.6% (N =

TABLE 1 | Demographic variables frequencies by total trauma and PTSD.

	N	%	Total trauma *M* (*SD*)	PTSD % (*N*)
Age			p <.001	p = .03
12 or less	184	17.9	7.93 (4.85)	46.2 (85)
13-14	485	47.1	8.74 (4.93)	57.4 (278)
15 or more	344	33.4	10.33 (4.42)	53.4 (183)
Gender			p <.001	p = .525
Male	496	48.2	10.12 (4.66)	52.4 (259)
Female	533	51.8	8.20 (4.87)	54.4 (290)
Family size			p = .192	p = .171
Below average	149	14.5	8.59 (4.40)	48.3 (72)
Above average	793	77	9.14 (4.82)	54.4 (431)
Family order			p = .144	p = .306
The first	199	19.3	9.27 (4.62)	52.8 (105)
The middle	664	64.5	8.94 (4.79)	54.8 (363)
The last	160	15.5	9.75 (5.18)	48.1 (77)
Place of residence			p <.001	p = .209
North Gaza	217	21.1	10.84 (4.51)	57.6 (125)
Gaza	201	19.5	10.88 (3.87)	57 (114)
Middle area	184	17.9	8.55 (4.78)	53.8 (99)
Khan Younis	198	19.2	8.50 (5.51)	47.2 (93)
Rafah area	228	22.1	6.98 (4.10)	51.8 (118)
Type of residence			p = .003	p = .221
City	692	67.2	8.88 (4.80)	54.1 (374)
Refugee camp	132	12.8	8.82 (5.16)	46.6 (61)
Village	203	19.7	10.18 (4.53)	55.7 (113)
Family income			p = .03	p = .245
Below average	770	74.8	9.26 (4.82)	54.7 (420)
Above average	217	21.1	8.48 (4.89)	50.2 (109)
Father education			p = .02	p = .01
None	190	18.4	9.43 (4.82)	55.8 (106)
School education	543	52.7	9.30 (4.82)	55.7 (302)
Higher education	280	27.2	8.35 (4.64)	44.2 (96)
Father job			p = .252	p = .464
Unemployed	469	45.5	9.31 (4.98)	54.5 (255)
Employed	548	53.2	8.96 (4.67)	52.2 (286)
Father			p = .04	p = .05
Alive	989	96.0	9.07 (4.77)	52.8 (522)
Dead	37	3.6	10.70 (5.86)	69.4 (25)
Mother education			p = .07	p = .189
None	176	17.1	9.59 (5.36)	52.3 (92)
School education	624	60.6	9.19 (4.67)	55.5 (346)
Higher education	219	21.3	8.51 (4.74)	48.2 (92)
Mother job			p = .423	p = .02
Unemployed	948	92.0	9.16 (4.75)	54.5 (516)
Employed	73	7.1	8.63 (5.54)	41.1 (30)
Mother			p = .56	p = .79
Alive	998	96.9	9.12 (4.84)	53.4 (532)
Dead	25	2.4	9.54 (3.45)	56 (14)
Citizenship			p = .003	p = .89
Refugee	335	32.5	9.76 (4.47)	53.1 (178)
Not refugee	690	67.0	8.82 (4.94)	53.6 (369)

TABLE 2 | War traumatic events frequency.

No.	Items	N	%
1	Has your house been destroyed completely by shelling or bulldozing?	59	5.7
2	Has your house been destroyed partially by shelling or bulldozing?	17	16.9
3	Have you been shot with live ammunition by occupied forces?	31	3
4	Have you been injured (e.g., wounds, burns, or bone break) by shelling, tanks, artillery, or military planes?	41	4
5	Have you been injured to the degree that you lost consciousness?	68	6.6
6	Have you been exposed to live fire by occupied forces, but you were not injured?	101	9.8
7	Have you been beaten by occupied forces?	49	4.8
8	Have you been exposed to shelling by tanks, artillery, or military planes, but you were not injured?	456	44.3
9	Have the occupied forces sieged your house, block, camp, or zone?	154	15
10	Has someone of your family members been killed by occupied forces?	85	8.3
11	Has someone of your friends, neighbours, or close relatives been killed by occupied forces?	389	37.8
12	Has someone of your family members been injured by occupied forces?	107	10.4
13	Has someone of your friends, neighbours, or close relatives been injured by occupied forces?	337	32.7
14	Have you attended to martyr's funeral?	380	36.9
15	Have you been forced to leave your home during the war?	328	31.8
16	Have you been detained at home during incursion?	367	35.6
17	Have you been threatened to death by being used as human shield to arrest your neighbours by the army?	73	7.1
18	Have you witnessed the occupied forces destroying house(s)?	552	53.6
19	Have you witnessed or hearing shelling by tanks, artillery, or military planes?	931	90.4
20	Have you witnessed or hearing the occupied forces opening fire against people?	442	42.9
21	Have you witnessed the occupied forces beating some one?	472	45.8
22	Have you witnessed killing or injuring someone by the occupied forces?	605	58.7
23	Have you witnessed arresting someone by the occupied forces?	426	14.4
24	Have you witnessed the occupied forces destroying trees and farms?	491	47.7
25	Have you witnessed the occupied forces were not allowed Ambulance access to hospital?	396	38.4
26	Have you witnessed the signs of shelling on the ground?	766	74.4
27	Have you watched mutilated bodies?	579	56.2
28	Have you witnessed assassination of people by rockets?	489	47.2

707) suffered from moderate to severe emotional symptoms; 52.2% (N = 538) suffered from moderate to severe social symptoms, and 52.4% (N = 539) suffered from symptoms of moderate to severe academic dysfunction.

Demographic Variables and Exposure to War-Traumatic Events

The relationship of various factors with exposure to traumatic war events was investigated. One-way ANOVA indicated that the effect of age was significant, $F(2,1006) = 18.45$, $p < .001$, $\eta_p^2 = .035$. LSD *post hoc* tests revealed that the oldest age group showed more exposure to overall war-traumatic events than the youngest age group ($p < .001$) and middle age group ($p < .001$). There was also a significant effect of gender among children and adolescents, $t(1,020.27) = 6.50$, $p < .001$, $d = .402$ with boys showing more exposure to traumatic war events overall compared to girls (see **Table 1**).

Type of residence was found to have a significant effect on war-traumatic events experienced, $F(2,1020) = 6.01$, $p < .001$, $\eta_p^2 = .012$. LSD *post hoc* tests showed that children and adolescents who lived in villages experienced more of these events than those who lived in cities ($p = .001$) and those who live in refugee camps ($p = .01$). There were also significant differences related to family income, $t(981) = 2.10$, $p = .03$, $d = .160$. Children and adolescents from families who earned less than the average income (US $550) reported higher exposure to war-related traumatic events overall than those whose families earned more than the average income (see **Table 1**).

Fathers' education level was also found to have a significant effect on exposure to war trauma, $F(2,943) = 3.55$, $p = .02$, $\eta_p^2 = .007$. LSD *post hoc* tests showed that children and adolescents whose fathers attended higher education (e.g., university) were exposed to less overall war-traumatic events than those whose fathers had no school education ($p = .02$), and those whose fathers attended school education ($p = .01$). There was also a significant difference between those whose fathers were alive and those whose fathers were dead, $t(1020) = 2.02$, $p = .04$, $d = -.305$. Children and adolescents whose fathers were dead reported more exposure to overall war-traumatic events compared to those whose father's were still alive ($p = .04$). Finally, the results indicated that there was a significant effect of citizenship, $t(1019) = 3.02$, $p < .001$, $d = .180$. Refugee children and adolescents reported more exposure to war traumatic events overall compared to non-refugee ones (see **Table 1**).

Demographic Variables and PTSD Diagnosis

The results showed that levels of PTSD diagnosis according to DSM-V significantly differed across age groups, $\chi^2(2, N = 1,011) = 6.87$, $p = .03$, with middle age group children meeting PTSD criteria more often than the youngest and oldest age groups (see **Table 1**). Results also showed a significant association between children's and adolescents' fathers' education and PTSD, $\chi^2(2, N = 949) = 8.88$, $p = .01$. Children and adolescents whose fathers attended school education were more likely to develop PTSD than those whose fathers attended higher education (e.g., university), and those whose fathers have no schooling. In addition, a significant association was found between PTSD diagnosis and the mothers of children and adolescents' employment status, $\chi^2(1, N = 1,020) = 4.88$, $p = .02$: unemployed mothers of children and adolescents showed a diagnosis of PTSD more often than employed mothers. There was also a significant difference in frequency of PTSD diagnosis between those with a living or dead father, $\chi^2(1, N = 1,024) = 3.85$, $p = .05$: children and adolescents whose fathers were dead had a PTSD diagnosis more often than those whose fathers were still alive (see **Table 1**).

Pearson's correlation analyses were performed to investigate associations between several continuous demographic variables (age, family size, family income, and parent's education) and both PTSD criteria (intrusion symptoms, avoidance, negative alterations in cognitions and mood, and alteration in arousal and reactivity) and functional impairment (somatic symptoms, cognitive, emotional, social, and academic dysfunction symptoms). Results indicated that age was positively correlated with increased arousal and reactivity, social symptoms, and symptoms of academic dysfunction (see **Table 3**): older children show higher levels of arousal and reactivity, social symptoms, and symptoms of academic dysfunction. There was also a positive relationship between family size and both PTSD criteria and functional impairment symptoms; so that the greater the size of the family, the greater was the level of PTSD criteria and functional impairment symptoms. In contrast, family income was found to be negatively correlated with PTSD criteria (except for avoidance, which was nonsignificant) and functional impairment symptoms. Children with high family income showed lower symptoms of PTSD criteria (except avoidance) and functional impairment symptoms. Similarly, parent's education level was negatively associated with intrusion symptoms, alterations in arousal and reactivity, somatic symptoms, social symptoms, and academic dysfunction symptoms, so that children with more highly educated parents had less of these symptoms.

Finally, significant positive correlations were found between exposure to war-traumatic events categories, PTSD criteria (intrusion symptoms, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity), and functional impairment symptoms (somatic, cognitive, emotional, social, and academic dysfunction symptoms). The more children and adolescents exposed to war-traumatic events, the more they met PTSD criteria and showed symptoms of functional impairment (see **Table 3**).

Prediction of PTSD

To investigate predictors of PTSD total score symptoms (adding the items of PTSD together), each of the demographic variables was first entered alone into a series of simple univariate linear regression models (see **Table 4**). Variables showing significant prediction of PTSD were gender (female), $F(1, 1,025) = 6.77$, $p = .009$, large family size; $F(1, 939) = 14.610$, $p = .000$; low family income, $F(1, 983) = 10.34$, $p = .001$; low father education, $F(1, 1,010) = 4.03$, $p = .04$; low mother education $F(1, 1,016) = 5.67$, $p = .01$; village residence, $F(1, 1,023) = 6.465$, $p = .01$; exposure to personal trauma, $F(1, 1,024) = 153.91$, $p < .001$; witnessing

TABLE 3 | Correlations between exposure to traumatic events categories, PTSD total score, PTSD criteria, and functional impairments symptoms.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Age	-																		
2. Family size	.023	-																	
3. Family income	.015	-.123**	-																
4. Father education	.000	–.101**	.382**	-															
5. Mother education	–.066*	–.114**	.304**	.524**	-														
6. Personal Trauma	.129**	.057	–.020	–.103**	–.096**	-													
7. Witnessing trauma to others	.200**	.072*	–.044	–.049	–.050	.501**	-												
8. Seeing properties demolition	.168**	.084**	–.005	–.041	–.033	.552**	.720**	-											
9. Overall trauma	.203**	.081*	–.031	–.075*	–.073*	.772**	.906**	.847**	-										
10. PTSD	.059	.124**	–.102**	–.063*	–.075*	.361**	.273**	.280**	.354**	-									
11. Intrusion symptoms	–.012	.128**	–.115**	–.093**	–.075*	.195**	.159**	.189**	.207**	.741**	-								
12. Avoidance symptoms	.049	.069*	–.003	–.020	–.034	.246**	.186**	.193**	.241**	.654**	.490**	-							
13. Negative alterations in cognitions and mood	.041	.074*	–.070*	–.037	–.056	.350**	.270**	.253**	.342**	.880**	.609**	.584**	-						
14. Alterations in arousal and reactivity	.097**	.115**	–.092**	–.062*	–.088**	.331**	.246**	.237**	.318**	.842**	.560**	.565**	.759**	-					
15. Somatic symptoms	–.001	.122**	–.133**	–.091**	–.094**	.298**	.251**	.224**	.307**	.801**	.673**	.531**	.706**	.700**	-				
16. Cognitive symptoms	.046	.104**	–.081*	–.032	–.031	.303**	.260**	.267**	.324**	.856**	.664**	.508**	.775**	.685**	.702**	-			
17. Emotional symptoms	–.006	.112**	–.074*	–.034	–.011	.164**	.184**	.214**	.224**	.785**	.761**	.459**	.640**	.586**	.667**	.688**	-		
18. Social symptoms	.076*	.087**	–.081*	–.067*	–.084**	.389**	.238**	.209**	.326**	.838**	.484**	.663**	.752**	.798**	.663**	.638**	.485**	-	
19. Academic dysfunction symptoms	.115**	.083*	–.099**	–.101**	–.135**	.358**	.242**	.234**	.324**	.750**	.383**	.428**	.733**	.757**	.575**	.568**	.384**	.702**	-

***Correlation is significant at the.01 level (2-tailed).*
**Correlation is significant at the.05 level (2-tailed).*

trauma to others, $F(1, 1{,}024) = 82.32$, $p < .001$, seeing properties demolished, $F(1, 1{,}024) = 87.40$, $p < .001$; and overall war-related traumatic events, $F(1, 1{,}021) = 146.32$, $p < .001$.

Next, a regression model was created with demographic variables entered together in step 1. This indicated that gender (being female) and having larger family size significantly predicted PTSD even when adjusting for the other factors entered in the model. Whether demographic variables moderate the effect of exposure to personal trauma on PTSD was investigated in step 2. Gender (female), low family income, large family size, and unemployed fathers significantly moderated the effect of exposure to personal trauma. In step 3, demographic variables' moderation of the effect of witnessing trauma to others on PTSD was examined. Being female and from large family size were significant moderators of the effect of witnessing trauma to others. Moderation effects of demographic variables' on the effect of seeing properties demolished on PTSD was investigated in step 4. Being female, from low family income, and large family size significantly moderated the effect of seeing properties demolished. Finally, in step 5, the regression model investigated whether demographic variables moderate the effect of exposure to overall trauma on PTSD. Being female and from large family size were found to be significant moderators of this effect. The highest R^2 that explains PTSD is the model that included personal trauma (17.4%) followed by total trauma (15.4%), witnessing trauma of others (10.3%) and demolition of properties (10.5%) (see **Table 4**).

Logistic regression analysis was performed to examine the association between exposure to war-traumatic events and PTSD diagnosis according to DSM-V moderated by demographic variables. When demographic variables were entered alone, analyses indicated that low father education ($p = .01$), unemployed mother ($p = .02$), exposure to personal trauma ($p < .001$), witnessing trauma to others ($p < .001$), seeing properties demolished ($p < .001$), and exposure to overall trauma ($p < .001$) significantly predicted PTSD diagnosis (Univariate analysis) (see **Table 5**). Next, demographic variables were entered together. In step 1, being an older child and having a father with low

TABLE 4 | Linear regression: prediction of PTSD from demographic variables and traumatic events.

Predictors	Univariate	Step 1	Step 2	Step 3	Step 4	Step 5
	β [95% CI]	β [95% CI]	β [95% CI]	β [95% CI]	β [95% CI]	β [95% CI]
Demographic variables						
Age	.05 [–.03, 2.09]	.09 [.27, 2.98]	.06 [–.21, 2.30]	.05 [–.38, 2.26]	.06 [–.29, 2.33]	.04 [–.58, 1.98]
Gender (Female)	–.08 [.94, 6.75] *	.06 [–.34, 6.14] *	.17 [5.24, 11.53] ***	.09 [1.33, 7.66] **	.08 [.72, 7.01] *	.13 [3.24, 9.49] ***
Family income	–.10 [–3.41, –.82] *	–.07 [–3.21,.03]	–.07 [–3.00,.00] *	–.06 [–2.89,.25]	–.07 [–3.17, –.03] *	–.06 [–2.88,.17]
Family size	.12 [.58, 1.81] ***	.11 [.46, 1.78] **	.07 [.08, 1.31] *	.09 [.25, 1.53] **	.09 [.232, 1.51] **	.07 [.11, 1.37] *
Father education	–.06 [–1.92, –.02] *	–.02 [–1.62,.88]	–.001 [–1.18, 1.14]	–.01 [–1.44,.98]	–.01 [–1.41, 1.00]	–.007 [–1.28, 1.07]
Mother education	–.07 [–2.29, –.22] *	–.04 [–2.14,.54]	–.04 [–1.92,.57]	–.04 [–2.08,.51]	–.05 [–2.17,.43]	–.04 [–1.98,.55]
Father's job	–.03 [–4.34, 1.52]	.07 [–.16, 7.12]	.07 [.01, 6.78] *	.06 [–.45, 6.60]	.06 [–.42, 6.62]	.06 [–.53, 6.33]
Mother's job	–.05[–10.34,.94]	.008 [–5.56, 7.05]	–.006 [–6.36, 5.35]	.01 [–4.68, 7.51]	.01 [–4.92, 7.26]	.01 [–4.92, 6.92]
Father's alive	.036 [–3.21, 12.59]	.03 [–4.35, 15.55]	.005 [–8.61, 9.93]	.03 [–4.19, 15.06]	.03 [–5.26, 13.97]	.02 [–5.57, 13.19]
Mother's alive	–.008 [–10.60, 8.28]	–.01 [–13.39, 7.86]	.01 [–7.91, 11.87]	–.01 [–12.82, 7.73]	–.009 [–11.59, 8.95]	–.008 [–11.58, 8.91]
Type of residence (city)	–.03 [–4.62, 1.58]					
Type of residence (refugee camp)	–.05 [–8.07,.631]	–.05 [–8.73, 1.14]	–.05 [–8.64,.51]	–.02 [–6.24, 3.37]	–.04 [–7.56, 1.99]	–.02 [–6.10, 3.23]
Type of residence (Village)	.07 [1.07, 8.36] *	–.01 [–4.83, 3.65]	–.02 [–5.50, 2.38]	–.02 [–5.55, 2.67]	–.02 [–5.52, 2.69]	–.02 [–5.56, 2.42]
Citizenship	–.008 [–3.49, 2.71]	.004 [–3.59, 3.97]	.004 [–3.29, 3.72]	.02 [–2.41, 4.92]	.01 [–3.02, 4.28]	.02 [–2.30, 4.84]
Exposure to war-traumatic events						
Personal trauma	.36 [3.87, 5.33] ***		.39 [4.23, 5.91] ***			
Witnessing trauma of others	.27 [1.95, 3.03] ***			.26 [1.78, 2.97] ***		
Seeing properties demolition	.28 [3.59, 5.50] ***				.26 [3.17, 5.24] ***	
Overall trauma	.35 [1.46, 2.03] ***					.35 [1.44, 2.08] ***
R^2		0.04	0.174	0.103	0.105	0.154

***p < .001, **p < .01, *p < .05.

TABLE 5 | Logistic regression: prediction of PTSD from demographic variables and traumatic events.

Predictors	Univariate	Step 1	Step 2	Step 3	Step 4	Step 5
	Exp(B) [95% CI]	Exp(B) [95% CI]	Exp(B) [95% CI]	Exp(B) [95% CI]	Exp(B) [95% CI]	Exp(B) [95% CI]
Demographic variables						
Age	1.08 [.99, 1.18]	1.21 [1.07, 1.37]**	1.18 [1.03, 1.34]*	1.17 [1.03, 1.33]*	1.17 [1.03,1.33]*	1.15 [1.01, 1.31]*
Gender (Female)	1.08 [.84, 1.38]	1.16 [.86, 1.56]	1.59 [1.15, 2.19]**	1.26 [.93, 1.70]	1.21 [.90, 1.64]	1.40 [1.02, 1.91]*
Family income	.83 [.61, 1.13]	.88 [.59, 1.31]	.94 [.62, 1.41]	.95 [.63, 1.42]	.92 [.61, 1.38]	.96 [.64, 1.44]
Family size	1.27 [.89, 1.81]	1.16 [.79, 1.72]	1.08 [.72, 1.61]	1.12 [.76, 1.67]	1.13 [.76, 1.67]	1.10 [.74, 1.64]
Father education	.78 [.64,.95]*	.76 [.58,.98]*	.78 [.59, 1.01]	.76 [.58,.98]*	.76 [.58,.99]*	.77 [.59, 1.00]
Mother education	.91 [.74, 1.12]	.93 [.70, 1.23]	.95 [.71, 1.27]	.94 [.71, 1.25]	.95 [.71, 1.26]	.95 [.71, 1.27]
Father's job	.91 [.71, 1.16]	1.22 [.89, 1.66]	1.24 [.90, 1.71]	1.21 [.88, 1.66]	1.20 [.87, 1.65]	1.21 [.88, 1.66]
Mother's job	.58 [.35,.94]*	.58 [.29, 1.13]	.54 [.27, 1.09]	.63 [.32, 1.24]	.63 [.32, 1.24]	.61 [.30, 1.22]
Father's alive	2.02 [.98, 4.16]	1.67 [.66, 4.25]	1.29 [.49, 3.37]	1.71 [.66, 4.40]	1.61 [.62, 4.16]	1.51 [.57, 3.95]
Mother's alive	1.11 [.50, 2.47]	1.39 [.51, 3.76]	1.80 [.65, 4.94]	1.40 [.51, 3.83]	1.52 [.55, 4.19]	1.78 [.61, 5.14]
Type of residence (city)	1.08 [.83, 1.40]	1.35 [.92, 1.99]	1.49 [1.00, 2.22]*	1.44 [.97, 2.13]	1.43 [.96, 2.12]	1.48 [.99, 2.21]*
Type of residence (refugee camp)	.72 [.50, 1.05]	.77 [.47, 1.28]	.80 [.47, 1.36]	.93 [.55, 1.57]	.86 [.51, 1.44]	.94 [.55, 1.59]
Type of residence (Village)	1.11 [.82, 1.52]					
Citizenship	1.01 [.78, 1.32]	1.16 [.82, 1.64]	1.16 [.82, 1.66]	1.22 [.86, 1.74]	1.18 [.83, 1.68]	1.21 [.85, 1.73]
Exposure to war-traumatic events						
Personal trauma	1.36 [1.26, 1.47]***		1.37 [1.25, 1.50]***			
Witnessing trauma of others	1.14 [1.08, 1.20]***			1.14 [1.08, 1.21]***		
Seeing properties demolition	1.30 [1.19, 1.42]***				1.30 [1.18, 1.44]***	
Overall trauma	1.10 [1.07, 1.14]***					1.11 [1.07, 1.14]***
R^2		0.046	0.123	0.081	0.090	0.111

***p < .001, **p < .01, *p < .05.

education significantly predicted PTSD. In step 2, moderation by demographic variables of the effect of exposure to personal trauma on PTSD diagnosis was investigated. Being an older child, being females, and living in a city significantly moderated the effect of children and adolescents exposure to personal trauma. Whether demographic variables moderated the effect of witnessing trauma to others on PTSD diagnosis were analyzed in step 3. Being older and having a father with low education level significantly moderated the effect of children and adolescents witnessing trauma to others. Step 4 investigated whether demographic variables moderate the effect of seeing properties demolished on PTSD diagnosis. Being an older child

and lower father's education significantly moderated the effect of seeing properties demolished. Finally, demographic variables' moderation of the effect of exposure to overall trauma on PTSD diagnosis was examined in step 5. Being an older child, female, and living in a city significantly moderated effects of exposure to overall trauma. The highest R^2 that explains PTSD is the model that included personal trauma (12.3%) followed by total trauma (11.1%), witnessing trauma of others (8.1%) and demolition of properties (9%) (see **Table 5**).

DISCUSSION

The aim of this study was to investigate the prevalence of war-traumatic events and PTSD among children and adolescents following the November 2012 Israeli attacks on Gaza. To our knowledge, this is the first study utilizing the diagnostic criteria of PTSD according to DSM-V. It is the second major war that children and adolescents have experienced (the first happened in December 2008 to January 2009), in addition to intermittent military attacks by Israeli army forces that take place from time to time. Hence, Palestinian children and adolescents are living in a situation of ongoing trauma that makes their lives more difficult and leaves them potentially vulnerable to develop mental health problems. Therefore, we intended to assess the effect of the exposure to the most recent (2012) war-related traumatic events on children and adolescents' mental health, specifically PTSD and daily functioning. The results showed that every child or adolescent had been exposed to at least one war-traumatic event. Further, the prevalence of exposure to traumatic war event categories (experiencing personal trauma, witnessing trauma to others, and seeing demolition of properties) was high; at least 84% of the participants experienced all types of exposure. As a result, a large proportion (54%) of participants developed PTSD symptoms according to DSM-V. These findings are consistent with previous studies showing that the greater the exposure to traumatic events, the greater the likelihood of developing PTSD symptoms (10, 21–23, 26, 28, 31, 41).

Undoubtedly, increased frequency and severity of war can cause severe symptoms and, in particular, PTSD symptoms. Accordingly, it is not unexpected that Palestinian children and adolescents who experienced continuous exposure to war-traumatic events reported increased prevalence of intrusion symptoms, avoidance, alterations in arousal and reactivity, and negative alterations in cognitions and mood. Consequently, the prevalence of PTSD found to be elevated in this study compared to previous studies (26, 42, 43). In addition, the results were consistent with previous studies showing high association between exposure to war-traumatic events and PTSD criteria (42–46). Exposure to war-traumatic events was associated not only with elevated level of PTSD criteria, but also with impairments in many areas of functioning. These findings are in-line with previous studies indicating that exposure to war-traumatic events is associated with impairments in cognitive, emotional, social, and academic functioning (42, 47, 48) and somatic symptoms (3, 42, 49).

Similar to previous studies (50–53), boys reported more exposure to war-traumatic events than girls. The reason of this may be related to cultural issues as Palestinian boys are typically encouraged to participate in political activities during the war, while girls are not (54).

Another factor that can affect exposure to war-traumatic events is the age of children. Results indicated that older children report higher levels of exposure to war-traumatic events, confirming what other studies of exposure to traumatic events have also shown (5, 7, 46). Palestinian children feel that it is their responsibility to participate in community activities. As they get older this responsibility increases. Accordingly, the more that children and adolescents participate in community activities, the more exposure to war-traumatic events they experience.

Children and adolescents living in villages showed more exposure to war-traumatic events than those living in cities or refugee camps. One of the explanations is that the villages are closest in proximity to areas of attack at the time of war. Haj-Yahia (55) found that children who are living in villages showed more internalizing and externalizing symptoms as a result of exposure to traumatic events than those living in cities or refugee camps.

In regard to PTSD diagnosis, although many studies have shown females exhibit more PTSD symptoms than males (28, 42, 46, 48), the current finding is consistent with other studies that found no gender differences in relation to PTSD prevalence (56, 57). However, being a female was a risk factor of PTSD symptoms and PTSD diagnosis according to DSM-V.

The results also demonstrated that PTSD was significantly associated with age. Older children exhibited more PTSD symptoms than younger ones. The cause may be related to biological and emotional changes that occur in this period of life; these changes are considered as stressors and may contribute to the instability of adolescent mental and physical health at time of stressful events such as war trauma. Thus, Gaza adolescents face not only internal stressors caused by biological and emotional changes but also external stressors due to exposure to war-related traumatic events, which make them more likely to develop PTSD symptoms.

Confirming findings from many studies that have revealed that low socioeconomic status is one of the factors that can increase the likelihood of PTSD development (26, 28, 58), the current results showed that children and adolescents with unemployed mothers and with parents with low educational levels were more likely to develop PTSD compared to those with employed mothers and parents with higher educational levels. It can be speculated that unemployed mothers and parents with lower educational levels may have lower family income and more economic pressure. Consequently, these may cause a reduction of resources that could otherwise serve to buffer the impact of war traumatic events on children's mental health. In addition, parents can play a central role in equipping their children with suitable resources fostering the development of resilience and coping strategies that can help them bounce back and prevent the development of PTSD.

This study investigated how different types of war trauma affected the development of PTSD while taking into account other demographic and socioeconomic status factors. Future studies may focus on investigating trauma more in depth by using a qualitative method. Challenges in the Gaza Strip should also be taken into account in further studies, since PTSD could arise due to other variables occurring between the war in 2012 and the time of the study.

LIMITATIONS OF THE STUDY

This study has several limitations. Firstly, data were collected a year after the war-related traumatic events occurred. As a result, participants may have forgotten some information regarding the emotional and social effects of the war. However, research has found that exposure to war-traumatic events predicted PTSD six decades after the war (59). Secondly, data were collected via multiple-choice questionnaires, not narrative answers. Future studies should use clinical assessment for more accurate diagnosis of PTSD. Thirdly, data were collected from one source (school pupils). Future studies should consider collecting data from other sources such as parents and teachers.

CONCLUSION

To our knowledge, this is the first study that investigated the relationship between demographic, socioeconomic status and different types of war trauma in one hand, and PTSD diagnosis according to DSM-V on the other hand, after the war in 2012 in the Gaza Strip.

Despite of the previous limitations, this study provides valuable evidence that demographic and socioeconomic factors mediate the relationship between war traumatic events and its classifications and categories, and PTSD symptoms and diagnosis. The current study proves that the surrounding environment of the child has an influence on the development of PTSD either as a risk or as a protective factor. The application of the ecological framework theory with children exposed to difficult situations as here involve the relationships between risk and protective factors in the various levels of the ecological model which are the individual (e.g., age, gender), family (e.g., family size, SES), and environment (type and place of residence, citizenship, war trauma and political situation) (60). As a result, the core stone of the ecological model represented by the connectedness of these resources and factors and their implications on the individual's life. Thus, the children who are exposed to war traumatic events as in this study, the risk to develop PTSD may exaggerate if the extended resources such as their familial environment are affected by war-related trauma (61, 62). For example, the findings emphasize the importance of parental level of education and income, which can, in turn, mitigate the effects of exposure to traumatic event and thus reduce the probability to be diagnosed with PTSD. Thus, intervention programs should focus and take into account the background of the diagnosed child including their gender, age, where they live, and their socioeconomic status (e.g., family income, parents' educational level, family size). Ideally, intervention programs should be designed to alleviate the psychological symptoms and to enhance the resilience of the children. Strategies, such as psychodrama, painting, and role playing, could be used with the children as well as social support for parents and teachers.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethical committee of Kingston University London. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

BE-K conceived of the study and its design, and coordinated and drafted the manuscript. MS conceived of the study and its design, and coordinated and drafted the manuscript. CA has been involved in drafting the manuscript. All authors read and approved the final manuscript and revised it critically for important intellectual content.

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Emotional Distress in the Relationship of Caregivers and Institutionalized Babies

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Institutionalization is an exceptional and temporary measure that occurs when there is a violation of rights; lasting until the family reintegration or, in the impossibility of this, the placement in a substitute family through adoption. Among the main reasons for institutionalization in Brazil are the financial difficulties, abandonment, domestic violence, drug addiction, homelessness of the responsible for the child, sexual abuse, and the loss of parents by death or imprisonment. Although children and adolescents have their rights assured when they are institutionalized, the care provided in these spaces does not include all their needs and demands, which may damage their affective-relational development. Maternal deprivation in the first years of life can be detrimental to the development of these children, if not provided by adequate substitute care. Therefore, to understand which place the institutionalized baby occupies in the imaginary of the social caregivers and, from this, how is established the relationship regarding the care, is of fundamental importance to assess and address the risk factors in child development at this stage of life and in situation of institutionalization. This is an exploratory and descriptive study, developed in a childcare institution, located in the city of São Paulo, Brazil, capable of accommodating up to 20 babies between 0 and 2 years old. Data collection was performed with nine employees, eight social caregivers and one general service assistant who work directly in the care of the institutionalized babies. Drawing-Story with Theme (DS-T) procedures were used. Qualitative analysis was based on Interpretative Phenomenological Analysis. The appreciation of the nine applied Drawing-Story procedures allowed the establishment of three discussion axes representations of baby, baby care, and early separation process. This study concluded that the difficulties that permeate the context of caregivers' work are the high turnover of institutionalized children, as well as employees, the difficulty of dealing with processes of bonding and breaking bonds and no recognition of the profession. We highlight that the place that these babies occupy in the imaginary of these

caregivers influences the bond they establish with the children hence the care offered to the babies. It is also noteworthy that these caregivers exhibited anguish and suffering from the reasons they believed led the children to be institutionalized.

Keywords: institutionalized children, early childhood, substitute maternal care, social caregiver, emotional distress

INTRODUCTION

Institutionalization in Brazil

In Brazil, 61% or 32 million children and adolescents are under the multiple dimensions of poverty. Of these, only 6 million, although belonging to financially deprived families, have their rights guaranteed. The others, besides living in poverty, have one or more rights violated, being in a situation of multiple deprivation. The United Nations Children's Fund (1) highlights that almost half of Brazilian children and adolescents are violated by one or more of their rights.

Brazilian law states that in situations of violation of the rights of children and adolescents, in which moderate protective measures have not been effective, if it is impossible for the family of origin to provide sufficient care and protection for their child, institutional care or substitute family as an exceptional and temporary judicial measure (2, 3). This institutionalization must last until family reintegration, without exceeding the 2-year period. If there is no possibility of returning to the original family, within this period, the child should be placed in a substitute family by adoption (3).

Among the main reasons for institutionalization are the financial difficulties of parents or guardians, abandonment by parents, domestic violence, substance abuse of parents or guardians, homelessness, death or imprisonment of those responsible and, intrafamily sexual abuse (4, 5). Of the 76,216 allegations of violation of the human rights of children and adolescents in Brazil during 2018, 36.3% referred to negligence; 24.4% to psychological violence; 20.35% to physical violence, and 11.22% to sexual violence (6).

Regarding the quality of the services provided by the Brazilian sheltering institutions, there is also the predominance of the assistance function and the fragility of the commitment to the developmental issues of childhood and adolescence (7, 8); which is the opposite that says the Statute of Child and Adolescent (2, 3).

Although institutionalization in Brazil is a legal measure for a full protection and guarantee of rights, sometimes the activities carried out in the sheltering institutions do not meet the needs and demands of institutionalized children and adolescents, and it is necessary to rethink those institutions as environments that allow the construction of positive identificatory references (9, 10). Among the main difficulties encountered are the high number of children per caregiver, the standardized care, the lack of planned activities and the shift changes of the caregivers, which promote a break at the end of each period, not allowing a continuous routine of care (10, 11).

In addition, there is the difficulty of social caregivers, also called social mothers, in elaborating and separating maternal desire and motherhood from the exercise of professional activity. In this sense, it is important for professionals to be aware to the fact that they are not the mothers of the institutionalized children (12).

Many social educators interpret institutionalization as "an act of unloving and inhumanity on the part of the mother's institutionalized children" (13), which influences your relationships with these children by assigning them a certain place and contributing to their social exclusion and belief in parental abandonment and unlovingness. Such conception is strongly observed when the sheltering occurs at an early age and the caregivers find themselves facing the abandonment and fragility of the baby (14).

Current data from "Conselho Nacional de Justiça" (National Council of Justice - CNJ) indicate that 47,000 children and adolescents in Brazil are in a condition of institutionalization (15), and of these, it is estimated that only 5% are in a family shelter situation, in other words, they are living in a family environment, with substitute families accompanying them until they can cease the shelter measure. For children aged zero to two years, there are more than three thousand in institutionalization (15). Regarding early childhood, regardless of the reason that leads to institutionalization, there will always be a rupture in the mother-child relationship, due to the induced separation in an essential phase for psycho-affective and motor development (13, 16).

Maternal Care

According to Bowlby (17), substitute care can be a way of trying to reduce the damage caused by the deprivation of relationship with the parents of institutionalized children. The author points out that "firstly, we have to recognize that separating a child under the age of three from the mother is a very serious thing, one that should only be undertaken for good and solid reasons and, when done, must be planned with great care" (17) (p.8). Though, the care offered by the institutions might not be entirely adequate, due to the specificities of the functioning of these services and the relationships that social educators establish with the children (10). Institutionalized babies often receive basic care but not affection, which can trigger difficulties in physical, mental and social interaction (18, 19).

Spitz (19) considers the relationship between the child and the mother, or who makes this function, the most important condition for the development, because its reciprocity makes the child able to gradually build a coherent image of his world, because it is a special interaction that gives the baby "an exclusive world that is his own, with a specific emotional climate. It is this cycle of action and reaction that enables the baby to gradually transform meaningless stimuli into meaningful signs" (19)

(p.43). His studies focusing on the effects of maternal deprivation on institutionalized infants under reduced or nonexistent care show a significant delay in their behavioral development in relation to children living in a family. Although basic hygiene and food care is adequate in institutions, there are implications that can influence bonding, such as the large number of children for few social educators, leading to a lack of stimulation and care (19), which can also be observed in the Bowlby's studies (17).

Psychological and Cognitive Development

In the first year of life there is the maturation and unfolding of innate phylogenetic functions; the child develops resources that allow him to adapt to the world around him, becoming progressively more independent from the environment. The mother, or her substitute, should present the environment to the baby through the emotional care offered, which are essential aspects for a healthy development. This, which is the first object relationship, allows the child to develop as a social being and serves as a model for the other relationships along their growth and insertion in other environments of society. It is understood that in the first phase of life the neurophysiological development is premature. The baby does not have the full perception of his own body, so he finds no difference between his and his mother's (20). The maternal function is essential for the child's psychic organization and constitution as a subject. It can be said that it is from the psychological organization developed through the relationship with the mother, or with the caregiver, that the child gains the ability to relate to other human beings (21).

Thus, maternal deprivation has consequences for the establishment of the baby's mental health (17, 19, 22) and might cause physical and mental distress, expressed through symptoms (23). Separation of the mother and the family environment at this stage of life can be considered an important traumatic experience.

According to Bowlby (24), attachment or bonding is developed in the baby as a result of the affective experiences shared with the environment in which he lives, especially in interaction with the mother figure. The attachment relationship is an instinctive behavior of the baby that consists of communication that intends to arouse the attention of the mother or caregiver.

The form of interaction between the mother or the representative of this function and the baby, the demonstration of interest in the care offered to the child, is what makes the fundamental bond for the child's development (25), in other words, mothering of the baby is established from the affective bonds built through the care that the mother will give to her child. França (26) points out that the "main characteristic of children who have suffered lack or deprivation in this primordial bond is to have a very reduced capacity for adequate responses, both socially and emotionally" (p.9).

Considering that the child custody is taken out of the family and sent to an institution where social caregivers are the closest adults, it is important to think about the essential role they play with these institutionalized children (18).

However, often this professional practice is not recognized and valued, making them feel disposable. Although fundamental, especially in such an important period as early childhood, they see themselves as unimportant to the development of children. In addition, when a child leaves the institution, the bonding process usually breaks down and the caregiver is no longer part of the life of that child for whom had affection (11).

Long-term institutionalization favors transient attachment with various educators. Over time, the children begin to avoid any closeness, thus it is possible to observe the trauma caused by the loss and rupture of ties with those who perform the function of substitute maternal care (10).

Peiter (27) mentions that "the contact with different caregivers and the experience of discontinuities of bonds and unfinished separations can be much more complex" (p. 51), so that experiences of attachment and rupture in later relationships are experienced; as mourning processes.

The Romanian studies point out the importance of the emotional attachment and the impact of the institutionalization for the brain's development (28).

Even with the consensus in studies on child development and protection that young children should be raised in families, that foster care in institutions can bring a lot of damage to their development (28), the Brazilian reality shows significant levels of risk and violation of the rights of children and adolescents, added to the low number of foster families that makes institutionalization still remains.

According to França (26), "It is possible for institutions to be organized in such a way that, despite the absence of the mother, the child can develop physically and psychically in a healthy way" (p.12). She cites the experience developed by Emmi Pikler, in Hungary, of institutional care for young children as a model to consider some necessary changes. It is important to note that although Pikler is known and respected worldwide; in Brazil her method is not applied in the field of institutionalization, but it is explored in the field of early childhood education, being used in early childhood education centers.

Pikler's method is based on two essential conditions for the healthy development of babies: the establishment of a quality affective relationship; and the child's free exploration of the world around him and himself, his movements, according to his interests and his pace (29–31).

Since birth, the child has resources to get in touch with the environment around him, which is, he has the necessary potential to actively contact his social and physical environment, but it will be his relationship with his mother, or whoever performs the maternal function, through his sensitive and adequate responses to the baby's demands, his crying, his expressions, his movements, which will allow him to develop his real abilities (32).

The baby should not be taken as an object of manipulation for care, he is a subject, he needs the affective relationship with an adult caregiver, who will be his reference and a facilitator in his exploration of the world in a creative and autonomous way França (26). In the words of Falk (30) the act of caring must be

taken as "an intimate moment, full of communication. The baby should not be considered as a simple object of care, but as a person who has an influence on events and establishes relationships, a true companion" (p. 34).

In Pikler's method, in addition to providing spaces thinking about the baby's need for him to move freely, it is also necessary to train professionals who take care of the babies in the institution, so that those professionals can understand the essentials of child development, as well as they became psychically available to the baby in their care (30, 31).

The bonding between social caregivers and institutionalized children can be considered an attachment relationship that, at times, is equivalent to the bonds of parents and children, and in this sense it is possible that the professionals who work in this context want to maintain the union with the child, often, causing suffering and frustration when the child is taken away (11). Thus, although the process of forming affective bonds is important and necessary, social caregivers cannot nurture the desire to take the place of a family member (20). In doing that, the position of social caregiver is permeated by the conflict between being affective and not being too attached.

Through the presence of caregivers, playing the role of social mother, institutions must be responsible not only for physical care, but also to provide support for the baby to have an appropriate psychic development. It is essential to offer the best possible care so that the child's emotional development is stimulated, through the formation of attachment relationships, even in institutional settings (33, 34).

It is known that environments with few stimulation and inconsistent parenting can delay and impair the cognitive development in terms of global intellectual functioning and language (35). The relationship between the caregiver and the child, in a literature review study, proved to be a decisive factor for the good development of institutionalized children (36).

Studies by Rossetti-Ferreira, Serrano and Almeida (37); Carvalho (38); and Keller (39) point out the importance of observing the formation of bonds as "a process co-built in interactions and dialogical relationships located in different contexts" (34), as what happens in institutionalization.

It should be considered that the social caregiver of the institutionalized babies sometimes can receives information about how circumstances the institutionalization took place, for example, as a result of violence and neglect of care and, from this information, suffer from identification with the traumas suffered by those children. Lachal (40) considers that the contact of caregivers with the suffering of the babies can result in multifaceted and significant experiences. The author proposes that the fact that the babies are not able to express themselves verbally acts as a potentiator of countertransference reactions in those who take care of them. Postulates, moreover, that the baby reproduces the same relationship pattern that it experienced in situations of abuse or violence, tending to repeat, in relations with substitute caregivers, the same model of relationship established with those who previously attacked him. Therefore, attempts at new bonds would tend to suffer the interference of the same feelings that permeated the most initial relationships. The new encounter would therefore be susceptible to feelings of helplessness, fear, sadness, anger, etc.

Lachal (41), defines the moment of shared pact between the baby and the adult caregiver as a process of interaction between both, in which the adult caregiver enters the "world of the baby" sharing with him his perceptions, sensations and existing experiences. For the author, when we take care of babies in humanitarian situations and here, we also add the context of caring in public institutions for the care of babies who have experienced traumatic ruptures of early bonds, our countertransference can be complex and ambivalent. We must renounce a certain illusion that we are always maintaining a positive empathic relationship with the child. For Lachal (42), if we, those who give the care, the caregivers, do not consider this countertransferential dimension in the relationship of the care, we will lose some skills during the "care." On the other way, by assuming the feelings of ambivalence in this countertransference process, we will be able to interact and better understand the baby's world and its interactions. Who knows, we may even be able to "play" with the baby (42).

In this sense, this study aimed to understand what place the institutionalized baby occupies in the imaginary of social caregivers and how, from there, the relationship of care is established, which plays a fundamental importance to assess and face the risk factors in the child development at this stage of life and in a situation of institutionalization.

MATERIALS AND METHOD

This study is part of a major research titled: "Assessment of risk factors for cognitive and affective development and early intervention in institutionalized babies from 0 to 2 years old."

Type of Research

This is a qualitative study of exploratory and descriptive characteristic, proposing institution is the São Camilo University Center, Psychology Department. The qualitative method aims to describe, understand and analyze the observed phenomena. In this method the knowledge emerges from a process of construction and reconstruction of the human being. It does not treat reality as objective, intrinsic and irreducible, but as construction on a permanent interdependent relationship between the subject, the object and the world (43).

Qualitative methods have historically been widely used in the human and social sciences and seek to describe a complex structure, to derive a theory, to produce hypotheses. Criteria that guarantee validity and credibility of the method are: the use of different sources of data collection; validation by the subject that is recognized in the description of the phenomenon; analysis by several researchers in order to strengthen the results achieved together; approach by a clearly defined theoretical field and the incorporation of sufficient perspectives to fully explore the phenomenon (44, 45).

Research Location

The present study was conducted in a childcare sheltering institution located in the city of São Paulo, Brazil, with a maximum capacity to accommodate 20 babies between 0 and 2 years old.

Sample

Data collection was performed with eight social caregivers and an assistant of general services who work directly in the care of the institutionalized babies.

About the participants, one is less than 20 years old, four are between 20 and 30 years old and four are between 40 and 50 years old. Six of the participants have children, three are not mothers and one expressed the desire to have a baby. All have completed high school, and none have university degrees.

To achieve the proposed objectives, the Drawing-Story procedure with theme (D-S with theme) derived from the Drawing-Story procedure designed by Trinca W. Trinca (46–49), was used. The Drawing-Story procedure was developed to be used as an auxiliary tool in psychological diagnosis. It is appropriate as a psychological resource to approach the mental world, allowing to identify fantasies, desires, anxieties, affections and feelings. A variation of the Drawing-Story procedure is the DS-T technique, which was developed by Vaisberg (50). It is an adaptation of the original procedure, facilitates the expression of subjectivity also allows the subjective investigation of any theme, which can be applied in different age groups, individually or in groups.

Such adaptation can favor emotional expression in a playful, relaxed, undefended way, allowing the development of research that includes different groups and social actors (46–49, 51).

It is a technique in which the examiner presents a blank sheet of paper, black pencil and colored pencil to the participant and asks him to make a drawing with the proposed theme. In this study, the proposed theme was "to draw a baby." After the drawing was done, the examinee was asked to freely narrate stories about the baby drawn. Then, the researcher conducted a free inquiry, in order to clarify the main points of the story told, aiming at a better understanding of the participant's psychic dynamics, the place that the baby occupied in his imagination, as well as the fantasies and expectations of taking care of a baby, and an institutionalized baby.

Such procedure, Drawing-Story, as Trinca (47) indicates when referring to Levy (52), accesses the expressive potential of drawing, allowing the elaboration of images and patterns, habits, emotions and attitudes, in a conscious way or not. The subject submitted to this procedure does not realize what he is expressing, because they are unconscious contents and, thus, will be less defensive (53).

Thus, it was decided not to use the semistructured interview instrument, seeking that social caregivers talk freely about babies and the care with them. Therefore, no type of interview was conducted, except the participants' initial data, such as age, education, and whether they had children. From the first story reported, they were asked to tell more about the baby drawn, to deepen aspects of their narratives, such as what the baby was thinking or feeling, how the person responsible for the baby was thinking or feeling.

Trinca (49) points out that the DS-T procedure as a method of psychological investigation has been used in research aimed at elucidating the representations and understanding of the unconscious related to the social and collective context. It is a technique in which the examiner presents a blank sheet of paper, black pencil, and colored pencil to the subject and asks to draw with the proposed theme.

In this study, caretakers (social caregivers or other institution's professionals) were asked to draw any baby and tell a story about him. From the first narrative brought by the participant, she was encouraged to speak freely about her perceptions about the baby drawn and the associations arising from them. The main themes addressed in their narratives were about the institutionalized children, motherhood, the family of the institutionalized children and the care of social caregivers.

Ethics

The research was submitted and approved by the Ethics Committees of Centro Universitário São Camilo: Research Committee (CPq) Centro Universitário São Camilo-SP, Document number PQ.66/2018; and Embodied Opinion of CEP CAAEE 95842818.2.0000.0062, number 2.843.363.

All social caregivers and other professionals at the institution were aware and agreed with the study being conducted. After the explanation and the signing of the Free Consent Form, the projective procedure was initiated.

Data Analysis

The data obtained in the drawings-story with theme followed what proposed by the Interpretative Phenomenological Analysis (IPA). It is a phenomenological method that aims to understand the meaning of behavior with a view of unity and totality, surpassing objective thinking. In this way, the researcher deepen into the phenomena of consciousness, starting from the analysis of the whole for the unit, understanding it from the point of reference of those who are part of the phenomenon that happens (54, 55).

In order to preserve the reliability of the research (44), the results were analyzed, discussed and compared by several researchers, ensuring that the definition of the themes found and derived from the analysis of the material obtained in the research, discarding the influence of the unique view of each researcher.

RESULTS

In this study, it was possible to verify three thematic axes: the first highlights the representations that caregivers have about the institutionalized baby; the second refers to the representations of caring for the baby and the third addresses the representations about suffering and the process of separation, suffering and trauma.

Each axis was divided into the found themes, as described in **Table 1**.

TABLE 1 | Presentation of the axis and main themes.

Axes	Themes
Baby representation	Baby that stays/Baby that leaves
	Imaginary bay/Real baby
	Naming of the babies
The baby caregiving representation	Continuity and discontinuity in the bond and caring
	Motherin role/Biological mother—heart mother
	Limits in caring
	Frustration in caring—Ability to care for the baby/ Ability to be with the baby
	Dyad of caring/group/institutional/social
Representation of separation and suffering	Survivor baby/rescued baby
	Suffering expressed by the body/Injured body
	Mistreated baby/untouchable baby
	Repetition of violence

Axis 1: Representation of the Baby

It is the representation that the caregiver has about the institutionalized baby. It should be noted that the participating caregivers do not officially receive information about the baby's history and the institutional care itself. From the reports of the technical team, the family or health professionals addressed to them, or conducted in their presence, they end up constituting a fragmented history of the baby. The Baby Representation axis consists of the following three themes:

Baby That Stays/Baby That Leaves

It is observed that, although the babies are in the shelter just temporary, the suffering of the caregivers is evident when the babies leave the institution. As can be seen in excerpts taken from the stories:

> *"The babies in the shelter are like rain to me, they spend time and then they leave."*
> *"When she left, I felt sad because I couldn't see her every day anymore[…]"*
> *"I feel profound sadness to see that they are abandoned here, but we end up getting used to seeing so many stories and it takes a lot of strength because the children are distressed, and this passes on to us."*
> *"Before, I didn't know how to deal with them leaving, I even got sick […]."*
> *"When they said he was going to be adopted, I cried (cries)."*

Imaginary Baby/Real Baby

The second axis contemplates the imaginary baby and the real baby. In the graphic representations, it was observed that all drawings represented older children.

Caregivers reported their wishes for a highly successful future for the babies they cared, in which they will assume the position of good caregivers:

> *"I imagine her as a doctor, who comes to change things, does not do drugs, nor rebells"*
> *"If he had left from this shelter, he would be a doctor, a doctor who would take care of me in the future, he would give love to others because in the shelter he received love and affection from us."*

Naming of the Baby

All the caregivers spoke about the naming of the children:

> *"I did the R."*
> *"I drew B."*
> *"The baby I drew has the same name as my son, it's called V."*

Some narratives related the names given to the babies who had already attended the shelter in the past, but to which they remained bonded, making the choice to represent them and tell about the care they had with them.

They seek for children they know, who can be named by their own names, representing their singularities in the environment in which they were immersed:

> *"…left two years ago, was called M.L."*

Calling the child by his name, talking about the qualities corresponds to taking him out of the condition of 'thing', and assigning marks that will make him a subject. There is an intertwining of the symbolic field with the imaginary field and the attribution of nicknames as affective games, made by social caregivers, helping in the insertion of the subject in the social environment:

> *"[…] was called M.L. She had curly hair,"*
> *"[…] today she asks to sit on my lap, raises her arms for us to take her."*

As pointed out by social educators in their narratives, children arrive at the shelter with names assigned by their parents and, when this does not happen, the judges who do so. However, caregivers assign a new affectionate name, sometimes a part of their own names or a nickname. These often carry subjective attributes, marking affective places, as can be seen in the examples below:

> *"[…] He is light […] is an incredible child."*
> *"[…] very mischievous, used to run all around."*
> *"A.S. her name, that cutie […]."*

Axis 2: The Baby Caregiving Representation

It refers to the representation that the caregiver has about caring for the sheltered baby. Some themes were relevant:

Continuity and Discontinuity in Bonding and Caring

It addresses the issue of discontinuity in both the bond and the care; alluding to the lack of maintenance of the bond with the child after the adoption:

"I shouldn't tell you because here they don't let you keep in touch with the children after they leave, but I keep in touch with the family and monitor her growth."
"When I was there, she was very happy, and when I wasn't there she missed me, she realized."
"It was a child I met here and I intend to take it with me for the rest of my life, not only her, but the others as well."

Maternal Function/Biological Mother - Heart Mother/ Limits of Caring

This theme is about the maternal function, pointing out the search for differentiation between the roles of mothers and caregivers:

"R. needs a mother who doesn't hurt her. We are not mothers, and there are always training courses here about it, but we always form a bond, even if it is forbidden."
"For me being a mother is everything, I do everything for them. It is to abdicate a little of yourself to give to the child. First comes the child, then, me."
"I've already been a heart mother of many children, all here. They need affection, care, but I know I'm not a real mother."
"I think she thought that I was her mother and that was good, having someone she could trust, who protected her, made her feel safe."
"Maternity is where you discover the other, now you deeply worry about another."
"When it is your child, it's different, the attention can be all his, here there are too many, it needs to be shared. It is quite different when you're a mother. To me, being a mother is everything, I'll do anything for them."
"I feel love, but I know that son I only have two, the ones in the shelter are not mine, I feel love for them, but I want them to leave."
"At the shelter, we take care of them, but with a family it is better, they receive more love."

It was evident in the participants' narratives the difficulty of differentiating the role of caregiver and mother caregiver.

Frustration in Caring - Ability to Care for the Baby/ Ability to Be With the Baby

In this theme, it is noted the frustration of caregivers for not being able to take care of babies as they would like:

"I think she would like a family very much, a home, and she misses that, because here we cannot give all the love and attention they need, they're so many."

The issue of dedicating themselves to the babies is demonstrated here. A feeling of guilt from the caregivers comes to light, as they are not able to offer all the babies the special attention, they assume they need:

"If he were always in a family, it would be totally different, I see it with my children, the care I gave to each of them, each one needs a different care, attention."

Dyad of Caring/Group/Institutional/Social

The theme deals with the specificities of caring in the dyad, in the group, in the institution and in the social:

"To be a social caregiver, it takes more than liking a child."
"Sometimes people don't believe in our work, but it is important."
"Being an educator is having responsibility, it is having love, but we also suffer from the stories, but it is gratifying to see the development […]."

It was observed that when the social caregivers have time, they seek to give more attention and affection, as can be seen in the report on the importance of caring for babies affectionately:

"[…] I just believe that they need affection and when there is time we need to give love, care."

The social caregivers who point to the family as the best option to leave the shelter, are actually referring to the extended family, that is, family members who can offer adequate support and care to the children, however, there are cases in which there is no family structure and this coexistence is impossible, leading then to the placement process in a substitute family:

"Children should be with their families, and that they should bear the responsibilities and care."
"I wish there was someone from the blood family to adopt."

Some reports indicated a preference for the child to be placed in a substitute family:

"[…] I thank God that here we didn't have many cases in which the children returned to their biological families […] if I were a judge, I would never allow that, because if the family did not want, did not care, there was no reason to return ".
"I can't imagine him in the biological family […]."

Axis 3: Representation of Separation and Suffering

The third axis refers to the representation of the process of separation, the suffering and about the trauma.

Survivor Baby/Rescued Baby

The theme refers to the issue of surviving babies who were rescued:

"He arrived here very sick, had several hospitalizations, suffered a lot, and I cried a lot, I suffered with him."
"She arrived at the shelter very weak, she couldn't even move."

Suffering Expressed by the Body/Injured Body

The baby's body is represented, in the participants' narratives, as a body that bears the marks of separation and suffering:

"She was abused … She arrived very sad She was crying a lot, she felt anguish, she rolled the mat asleep."
"She is lying down because she was like that when she arrived, lying down."
"She arrived here with a more relaxed look in the eyes, I think it was due to the various hospitalizations she had, to be left in the hospital as soon as she was born and to have spent a month in the hospital after her birth."

Mistreated Baby/Untouchable Baby

The theme reflects the difficulty of taking care of the supposedly neglected and/or mistreated babies:

"She was abused, and I was afraid to touch her, because she could think it was happening again."

Repetition of Violence

This theme picture the reference to the risk of repetition of negative experiences that babies absorbed and, consequently, to the transgenerational transmission of suffering and trauma:

"He will pass on to his children what he received from his parents, so he will not be loving, caring, because he did not receive it from them."
"I feel profound sadness to see that they are abandoned here, but I end up getting used to seeing so many stories and it takes a lot of strength because the children are distressed, and this passes on to us."

DISCUSSION

This work attempted an approximation of the experience of those who have the mission of taking care of institutionalized babies. We analyzed the different forms of care provided by the professionals at the institution, with the aim of proposing new ways more adapted to the needs of the population in question.

Working with neglected and/or suffering babies can be impactful, to the point of causing not only the rejection of what these victimizations represent, but also triggering a paradox in caregivers, implying in overcaring or failing to care properly.

There was an insistence on naming babies, which can translate into a search to humanize them and make them subjects; failing to consider them only as victims and allowing them other possibilities of existence. The attribution of names to things and people refers the subject to the field of reality, that is, it marks his existence. Therefore, naming also has a function regarding the psychic constitution (56).

This process also makes it possible to have a differentiation between the subjects, since the name also occupies a privileged place in the symbolic field (57). It is about giving the child a place of existence, through which they will read about this mark that has been attributed to them; that is, the name carries a load of desire from the one who named it.

Caregivers consider that all babies deserve special care. And when they are unable to provide idealized care, they feel guilty.

It was possible to observe the presence of the feeling of loss and anguish of separation and approximation resulting from the care practices applied by the caregivers to the institutionalized children. The narratives of the professionals about the care offered by them to babies, as specific to the development of infants, denote the recognition that the team that works at the institution is important for the evolution of the institutionalized.

They also pointed out that for the healthy development you need to be inserted into a protective and loving family environment, as the shelter cannot offer more specific care, because they should be divided to the same time to many babies; as noted in the literature on institutional care (10) in relation to the high turnover of babies and employees, and the high number of children for few professionals.

Another important factor observed in the narratives was the child's right to know about his story. The revelation of biological experiences, prior to adoption, is a child's right. Even if the parents do not talk about the subject, Dolto (58) points out that "the unconscious knows, but if its true story is not put into words, the child's symbolic life will be on insecure bases" (p.235).

In view of the unfavorable position and the negative view of the shelter as a space to foster child development, the caregivers consider that it is most appropriate to be inserted into a family environment that enables the formation and establishment of lasting bonds (11).

The new relationships that the caregivers establish with the babies open the potential for transformation to the scripts or scenarios of suffering that accompany the babies. As Lachal (41) considers, the caregiver or professional with the mission to care and protect the baby is their environment. In these meetings, positive bonds are established, which allow the retrace of new possibilities for the baby's development.

However, the baby does not yet have the ability to communicate through words. Thus, the absence of a narrative discourse implies that caregivers have the ability to decentralize themselves in a more elaborate form of communication, requiring a certain unusual regression for an adult. This process requires being able to enter the baby's world, of course, when he invites us, living with the baby's point of view, with the experiences, perceptions, feelings and at the same time trying to know and overcome the psychic invasion that the baby's suffering can raise in the environment in which he is living. As Lachal (41) explains, these moments of affective agreement do

not depend exclusively on the mother's or caregiver's ability to regress, but also on an exchange, complicity and association between the baby and the adult caregiver.

One of the aspects found in the analyzed material is the fact that caregivers avoid establishing an attachment with the baby so that they do not have to experience the loss, absence and separation from the baby. This could indicate that there would be a sharing of the baby's experiences, including traumatic experiences with caregivers (40). There is a dilution of this trauma which contributes to the reconstruction of the baby's psychic, emotional and physical state. In this context, before arriving at the shelter, the child who has already traveled along the routes of his life, during relationships and early experiences, moments of traumatic suffering in his emerging scenario, can gradually enter into a process of exchanging and sharing these experiences with adults caregivers, diluting and unraveling this emerging scenario. In this way, it is possible to create care devices adapted to the good development of babies, through the adapted material built together with the caregiver-baby dyad and the group, including researchers and care professionals, with a view to an environment adapted for good development of the baby.

Before the baby moves from one stage of development to another, he goes through these moments of transition, in which the trauma experienced dramatically influences the stages of his development, and there may be a loss of confidence, where he will have reliving traumatic situations.

A central point of the shelter institution is that caregivers can influence the development of these stages of traumatic experience (early separation, neglect, suffering)—it would be as if they were changing these stages (given that they do not know the baby's dossier). The way he is cared in this transition phase, between the "nonprotective" family and the foster family —"idealized family" can influence how the caregivers will revive the trauma together with the baby. It could be said that one of the functions of the caregivers would be to act as a "catalyst" of emotions, of undetermined and unnamed experiences that could leave both the baby and those who care for him, in a process of sideration inherent to the traumatic scenario that each one lives (imaginary and real).

During the procedure of drawings and stories, a symbolic encounter takes place between "the caregiver and the baby." While the caregiver draws and cohabits the baby's story, it is possible to reestablish a bond with the baby through which coexistence is dual and group. These are moments of coexistence between the adult caregiver and the baby where the potentials involving care and the way care is instituted circulate. It is as if there was a new impact, a new space and a new time for a new construction of the "new."

When talking to caregivers, the idea of "flashback" can be considered. The fact of asking to draw any baby and they draw the institutionalized babies allows us to consider that the DS-T procedure becomes a potential space where the baby can be thought in another way. The baby who supposedly lived in situations of neglect, early separation and physical and emotional aggressions, can be narrated by the adult caregiver in a way that appears humanized, receives a name, care, and affection; ceasing to be that baby who had been reduced to being a victim of the inadequacies of the aggressive, negligent and nonprotective biological family environment.

The baby who arrives at the institution has a course of crisis, shock and rupture that ends up involving other protagonists, whose are not belonging of the family, such as the caregivers, judges, researchers to try to change the script's destiny, of the traumatic emerging scenario. Each stage of the experience of the story told, between the caregivers and the baby; between caregivers and the institutional working group and between caregivers and researchers, allows sharing the baby, with what this little being represents and the baggage he carries as well as the scenario that emerges from his life and in his environment. As previously said, even without speaking he is able to share and communicate because in the process of living together and exchanging from a shared agreement, the adult imagines a story about the imagined baby.

It can be considered that the baby tells his suffering and his needs with his gaze, his yell, his cry, depositing and sharing this suffering, that the adult caregiver will assign meanings and, from that, respond to the baby. It is this process of sharing the trauma that eases the density and intensity of pain, both for the baby and the adult caregiver (41).

In this study, the participants spoke and drew the baby from the institution, exposing the life experience that this baby lived. It is noticed in the analysis of the results that they liked to talk and to be heard about that feeling of the "unspoken" of the babies, of the baby's impossibility to speak, but at the same time he is able to express the cry for help, or maybe, they are able to decode the scenario of a helpless and institutionalized baby.

The bond with the adult caregiver allows to change the traumatic mark previously established with a nonprotective adult. The exchanges and the way of care conducted by the caregivers allow the reconstruction of the universe of these institutionalized babies. Some questions inspire us, among them:

- How to train caregivers not to be invaded by the baby's trauma and to be able to take care of him, give a care good enough for him to continue development?
- How to establish a favorable bond with the baby and vice versa?

CONCLUSION

Institutionalized children or those deprived of their families experience a rupture in the mother-child relationship. The narratives and the graphic material made it possible to verify the difficulties that permeate the context of the performance of these professionals, such as the high turnover of children entering and leaving, as well as employees, the difficulty of dealing with the babies leaving, that is, the bonding process and bond breaking and nonrecognition of the profession. Emphasizing, mainly, the anguish and suffering of the participants from the reasons that they believe lead the children to be institutionalized.

It was also evident, through the interpretation of the data obtained in the DS-T procedure, that there are disagreements

regarding the professionals' conception about the placement in a substitute family or family reintegration. Most participants consider the institutionalization to be important, as it is a protective measure for children in situations of vulnerability and risk due to neglect, early separation and mistreatment.

Another aspect present in the narratives were questions about the formation of bonds between social caregivers and babies, and also the prohibition to keep in touch after the children left the institution. Therefore, it is possible to verify that the work with institutionalized babies causes a series of personal, emotional and structural issues that can have impacts. Therefore, the caregiver as the child can experience the formation and rupture of bonds at different times, which can generate losses understood as inherent to the emerging scenario present in the trauma transmission process.

It was highlighted that the narratives and drawings allowed us to observe that many of the social educators, although recognizing that the institutionalized babies are not their children and that the professional performance scenario is marked by pain and suffering, they imagine one day being remembered affectionately by adults who the babies will become, for having played a maternal role in their lives during the institutionalization period, which indicates that in addition to professional recognition there is a need for a place of affection.

The difficulty of differentiating personal life from professional life, was part of the narrative of social caregivers and other professionals participating in the study who called themselves, in some drawing-stories, as "mothers of the institution." If, on the one hand, the feeling of mothering with the institutionalized babies can generate confusion of roles and feelings of sadness when the baby leaves the institution; on the other hand, there is evidence of the establishment of bonds between the professionals and the babies, these bonds being fundamental for healthy child development.

The analysis of the data obtained favored the understanding that the high number of institutionalized babies to a few professionals is an issue that needs to be rethought, since social caregivers sometimes told about it in their stories, justifying not offering care with quality due the lack of time and not due to negligence or unwillingness.

In this sense, it is important that Brazilian public policies regarding institutional care are rethought both in terms of the number of people being institutionalized and in the sense of seeking interventions that allow listening to social caregivers, allowing them a space to elaborate their losses and anguish, which directly impact on the baby care.

The study allowed to understand the imaginary and fantasies of the professionals in relation to the institutionalized babies, and the magical solution of an idealized future of success, in which children overcome the marks and frustrations caused by abandonment in early childhood and living in an institution.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding authors.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethical Committee at São Camilo University, PQ.66/2018; and Embodied Document of CEP CAAEE 95842818.2.0000.0062, document number 2.843.363. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

RN: conception and design of the study, organized the database, wrote the sections of the manuscript, wrote the first draft of the manuscript, performed the statistical analysis, and revised the manuscript. MO: conception and design of the major research, rewrote and revised the manuscript. GB: conception and design of the major research, revised the manuscript. AL: wrote the first draft of the manuscript, wrote the sections of the manuscript. FG: wrote the first draft of the manuscript, wrote the sections of the manuscript. TB: conception and design of the study, organized the database, wrote the sections of the manuscript, performed the statistical analysis, and revised the manuscript. All the authors contributed to manuscript revision, read, and approved the submitted version

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Cultural Competence of Professionals Working With Unaccompanied Minors: Addressing Empathy by a Shared Narrative

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Background: The number of migrant youth traveling without parents continues to rise in Europe and North America. Some of t hem leave their home countries on their own and find themselves in a new country, separated from their family and cut off from their cultural roots. Besides those who leave to study, work, and pursue a better life, others are escaping war-torn countries. They need adequate social, educational, and therapeutic spaces, where they can feel entitled to speak. Social workers often ask about how they can understand these young people better so that they can provide them with better care (cope with their trauma and suspicion, deal with the cultural distance between the adolescents and their social workers, etc).

Aim: At Cochin Hospital in Paris, we led a participative action-research program to transmit cultural competence to social workers who provide care for these youth. The aim was to develop an approach to help these young migrants to share their representations about themselves and to train these social workers to encourage this sharing in a culturally sensitive manner.

Methods: This study used a qualitative method that mixed narrative and transcultural approaches. Two researchers met each youth and social worker with an interpreter-cultural mediator three times (once a month) to assess changes in their relationships during the study. The youth were asked to bring three items of their choice, representing their past, present, and future. They could use their imagination and creativity. We also used the circle test described by Cottle for this purpose. We used a phenomenological approach to analyze the interviews.

Results and Discussion: This study included 29 young people from 13 different countries and 29 social workers. A transcultural approach appears to be a useful framework for reactivating their identity construction process. It promotes the emergence of cultural representations and takes their experiences before, during, and after migration into account. We assisted them in developing their ability to produce a

thorough narrative of their bicultural adolescences and simultaneously helped their social workers to develop their cultural competence.

Conclusion: Together, a transcultural approach and methods stimulating the production of narrative are relevant ways to help children to describe their representations of themselves, especially those who have learned to protect themselves by remaining silent. This protocol could be useful for both preventive action and therapy for psychotrauma.

Keywords: unaccompanied migrant youth, cultural competence, transcultural approach, migration, trauma, social work

INTRODUCTION

In France, unaccompanied immigrant minors are considered to be children unprotected by parents or other legal representatives. They often come from North Africa, the Indian subcontinent, or sub-Saharan Africa, after a perilous journey. Some have left their country and their family to study, work, and pursue a better life. Others are escaping war-torn countries. Some are seeking asylum, while others are not. They are separated from their families and cut off from their cultural roots. Most of them have faced traumatizing adverse events before, during, or after their journey. The mobilization of their psychological resources is thus essential to cope with the difficulties they confront, to ensure their survival, and to face the challenge of migration to a world they had idealized but did not know, one that disrupts their identity.

Despite the absence of clinical homogeneity, most of these teenagers have had to live alone through their identity construction period and have often experienced repeated trauma and multiple bereavements. The brutal and repetitive ruptures that they experience may generate mental illnesses, especially attachment or posttraumatic disorders. Studies report that 52% have posttraumatic disorders, 44% depressive syndromes, and 38% an anxiety disorder (1–4). For around a third of these adolescents, these disorders go on to become chronic (5), especially those with anxious or posttraumatic symptoms (6).

The only significant protective factors so far reported are optimal social work, school management, and long-distance family support (7–9). Accordingly, international publications about these young people (7, 10–13) underline the need to improve how professionals understand them and to provide better care to prevent these psychiatric disorders. Nonetheless, the professionals responsible for providing them with support often feel helpless as they require information to help them to understand and take action (14) to assist these unaccompanied migrant youth, whose issues differ greatly from those of teens traveling with their families. The social workers who work with them must cope with a variety of problems. In France, the Child Welfare Bureaus, responsible for providing services for them, are saturated because of the continuous increase in their number since the turn of the century.[1] Lack of knowledge about the youth's culture and lack of training about symptoms of trauma can lead to misinterpretation and misunderstanding. Furthermore, a degree of suspicion often interferes with the social work: these youths are regularly suspected of making up stories to obtain legal immigration status (15). The teens themselves may experience difficulties in trusting any adults, after the loss of their family or other various traumatic events, including being victimized by smugglers. The discontinuities in social work services do not promote either clarity about the social workers' role or the quality of the services they provide. On arrival in France, these young people are first evaluated to verify that they are indeed minors and without family; they are then transferred successively to different sites (an emergency shelter, and then a more stable group home, or hotel or foster family). Finally, these youngsters confront a multiplicity of difficulties and paradoxes. Because their absence of adult protection prevails over their "foreignness," they receive temporary legal protection and social services in France. At 18, however, they can be deported back to the chaotic environment that they fled, often at the risk of their lives. They are exposed to extremely discordant attitudes among the professionals who deal with them (due to the conflicts between immigration policy and child protection laws).

Professionals consider that overcoming these complex and specific problems requires transcultural skills, concepts defined by Domenig (16) and Althaus (17). The transcultural approach has developed over the past 20 years in France; it is based on the assumption that to understand and effectively care for migrants, it is necessary to take into account their cultural affiliations, their ways of thinking, but also their migration experience (12, 18, 19). Creativity is required for helping these young unaccompanied migrants whose families are far away (18, 20).

From a psychological perspective it is imperative to provide a setting where they feel welcomed and create spaces where they can express their needs and desires. Good communication is also essential in constructing a "working alliance" with them, especially at their arrival, when they are in the greatest need of information.

The *Maison des Adolescents* (French facilities providing integrated youth health care) (21) at Cochin Hospital (known as the *Maison de Solenn*) in Paris conducted a qualitative study[2] from 2012 to 2016 of the construction of narratives, jointly by the

[1] In France, 14,908 unaccompanied minors were reported in 2018, compared with 8,054 in 2016 (source: Ministry of Justice).

[2] NAMIE Research Action: New Welcome for Unaccompanied Foreign Minors. Laboratory Inserm U 1178, Center Babel (S Bouznah), Hospital Cochin: Pr MR MORO (director of research), R. RADJACK (scientific supervisor), F. TOUHAMI, S MINASSIAN, L WOESTELANDT, C. LEBRUN, A. BERNICHI, S MALEY, A. MOSCOCO, S HIERON, F. HOLLANDE, J LACHAL, G LECONTE, T BAUBET, G STURM, A BENOIT, C LEDU, S ZIEMER, J MAILLARD.

young unaccompanied migrants whose life stories these are, and the social workers responsible for them. This research involved creating a situation where the youth and his or her social worker could meet and learn from each other and where we and the social workers could learn more about these youth and their journeys. It is part of a comprehensive interinstitutional project jointly conducted by clinical departments (*Maison de Solenn*-Hospital Cochin), a research group (INSERM U1178), and the Paris Child Welfare Bureau.

Our study had a twofold principal objective: 1) to develop an approach to help these youth describe their representations of themselves, as well as their journeys and their answers to transcultural questions from the narratives they provided, stimulated by objects they chose; and 2) simultaneously training the social workers who work with them to encourage this sharing in a culturally sensitive manner. Our aims were to identify how gain access to their perspectives, while taking into account their cultural representations, and to teach this skill to social workers. The secondary objective was to assess the youths' experience of the treatment program we studied. We seek in particular to identity the aspects useful for the preventive or therapeutic management of psychological trauma in this population at risk.

MATERIALS AND METHODS

This is a qualitative study. The appropriate ethics committee (CEERB Paris North IRB00006477) approved this protocol in 2014.

During a *focus group* that took place during the exploratory portion of this study with our partners of the Child Welfare Bureau, care providers and social workers often expressed a sense that they were "missing something" in their encounters with these youth. These destabilizing professional experiences engendered countertransference reactions of helplessness and failure. We therefore constructed a research framework likely to facilitate the emergence of the teens' discourse about accurate representations of themselves. We wanted to give them the chance to develop narratives that escape the preconceived representations associated with their status. The underlying idea was to initiate, when necessary, a process of change in social workers' representations of the youth to whom they are providing services and support and to help the professional recognize when this process is necessary and how to trigger it. In the literature on transcultural competence, we rely on the concept of narrative empathy set forth by Domenig (16), who describes this as the ability to listen in a way that is kind and supportive.

For the young migrants, this method attempts to induce them to feel the continuity of their existence and to help them construct their identity while far away from the landmarks that helped construct it. The theoretical foundation comes from the psychoanalytic literature on psychological trauma and identity reconstruction (22–24); narrative identity (25–27); and transcultural psychotherapy (18). At stake is the adolescent's resumption of the process of identity construction, which this self-narration is intended to facilitate.

Participants and Sampling

The study took place in three different cities (Paris, Bobigny, and Lille) among the districts hosting the largest portion of unaccompanied minors. Recruitment took place through two gateways: either after information meetings in the institutions chosen with the assistance of the Child Welfare Bureau (facilities serving mainly unaccompanied minors in their group homes); or after a request for psychological care by social workers to our team of transcultural clinicians.[3] Participation was proposed to social workers who asked how to get to know the young migrants better because they felt that that they did not understand this population, or were missing something, or that there were cultural misunderstandings or distrust. It was also suggested when some action for the youth appeared useful but long-term follow-up seemed unnecessary, so that a limited number of interviews would be most productive.

The inclusion criteria for the young migrants were: agreement to participate, with their signature attesting to informed consent after translation by the interpreter), aged 11 to 19 years, and the agreement of their institutions for the social workers' participation. An information sheet about the study was provided to social workers and adolescents. This information was provided in the youth's maternal language, with the help of an interpreter. Particular care was given to the information and explanation of the study, especially in the context of the differences in language and culture and the often traumatic context of migration. We used purposive sampling to include participants who were typical of the study population. Both the professionals and the youth people included signed consent forms. We excluded those teens for whom immediate psychiatric care (for an acute psychiatric illness) was more important than participation in research. The data have been anonymized.

Setting and Data Collection

A semistructured interview topic guide developed in the exploratory study was used to probe each youth's cultural identity, journey, perception, and experience after migration. A focus group including several transcultural clinicians sought to identify the most relevant and simplest questions enabling the emergence of a discourse and showing an interest in the other's culture. The semistructured interview was drafted and then reassessed by a group of 10 transcultural experts. The circle test was added after a preliminary study, as was a self-administered questionnaire for professionals about the difficulties they encountered and the strategies they used in transcultural situations, required of professionals who wanted to participate in this study.

The process involved three meetings led by two researchers (trained in transcultural clinical care and management of psychotrauma) in the presence of the referring social worker

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and an interpreter-mediator to coconstruct a life narrative. We relied on three tools to facilitate the narrative: objects, the circle test, and cultural mediators. Accordingly, the youth were never directly questioned about their journeys; they were free to choose the topics selected.

The three meetings took place, each a month apart (**Figure 1**). The interpreter-mediator, the minor, the referring social worker, and two researchers experienced in transcultural clinical care were present for all meetings. The first meeting began by asking the adolescent to take the Circle Test (**Table 1**), to test his or her spatial perception of time (28, 29). This test allowed the subjects to represent their perceptions of the past, present, and future, as well as the potential correlations between them.

At the end of this first meeting, the teen was asked to bring three objects or thoughts (for example, some music, an image, a souvenir/memory, or a sentence) to the next meeting. The three objects were to be associated with the adolescent's past, present, and future and were required to illustrate some aspects of their inner life, chosen randomly by context, mood, and the investment of the social worker. We were inspired by the floating objects used in a systemic approach (30, 31). This enabled the young participants to use their imagination and creativity. Methods stimulating the production of narrative are relevant ways to help children to describe their representations of themselves, especially those who have learned to protect themselves by remaining silent.

The second meeting involved the exploration of the interaction between the adolescent and his or her social worker, in the presence of the interpreter-mediator.[4] The objects provided the basis for the narrative. The researchers made transcultural propositions (18, 32, 33), while adopting narrative empathy, that is, listening attentively in a way that let the narrative move forward without being forced. Its emergence was facilitated by the active intervention of the mediator and the anthropological interpretation of the objects. The interpreter's role is not solely to facilitate the progression of the narrative. The shared language and the interpreter's knowledge of the world the youth comes from increase the possibilities of identification and promote the construction of the narrative by enabling an association between the youth's past and present (**Figure 2**).

At the third meeting, conducted as a semistructured interview, each participant provided feedback about the overall experience. As in the first interview, the young participants were asked to take the "Circle Test" to see if any changes had occurred in their subjective experience of time from the beginning to the end of the study.

All interviews were audiorecorded and transcribed verbatim. All of the self-administered questionnaires were completed and used for our question-by-question analysis. The two sheets of the circle test (one the first month, and the other the third) were also collected for the analysis.

Method of Analysis

The analysis—qualitative and thematic—is organized into two main themes: first, analysis of the life narratives, and second, the analysis of the changes in the narrative during the three interviews, as related to the mediators used (the circle test, the objects, and interpreters-mediators). A dual phenomenological and narrative approach is thus used (34–37).

TABLE 1 | Instructions Circle test (28).

Instruction	*"Represent the past, present, and future in the form of circle"*
Guidelines	*"Draw three circles using the space of the white sheet, to represent the past, present, and future. Place them in the way that best represents what you feel about the relation between the past, present and future. You can use circles of different sizes"*
Legends	*"When you have finished, label each circle: the ones that represents the past, the present, and the future."*
Comments	The adolescents are asked to comment on their circle tests

The phenomenological approach is descriptive (35, 38). The analysis focused on the subjects' narratives, the ways that they put their lives into a story to give it a meaning. The aim is thus to report the youths' experiences holistically, preserving their richness and complexity. The analysis took place at several levels, as we attempted to demonstrate change and what drives it in the evolution of the discourse (content and form), to disengage its major themes, its context, and the individual, interpersonal, group, and societal connections.

The interview transcripts were analyzed thematically. They were read several times and then coded to identify the first themes. Initial codes were generated and then sorted into broader themes, with similar codes placed under the same theme. A theme was determined on the basis of its significance to the research question. Themes were then revised and refined to ensure codes within each theme were closely associated and that each theme was distinctive. Themes were then named. Procedural consistency was guaranteed by using a double-coding approach, with cross-checking between coders to ensure consistency. The youths' names have been replaced by letters to protect their privacy. The analyses were performed simultaneously by one researcher who did not participate in the interviews and one who did. The researchers sought to distinguish the recurrent patterns, but they also integrated the emerging questions to take the convergences and divergences in the data into account. Divergences in assessment were resolved by a third researcher. The final stage is the production of a consistent ordered presentation of the themes that describe the participants' experience (35).

The circle test was analyzed as described by Cottle (28): the sizes of the circles, the distance between them, their contents—all of that, juxtaposed to the narrative analysis of what was said about these circles and taking the transcultural context into account. We analyzed the changes of these circles between the first and the third interviews (39). The objects were analyzed from an anthropological perspective. The mediator assisted in the interpretation and in explaining the youth's choice of object. The discourses around these objects were analyzed according to the content of the corresponding narrative, their poetic structures (themes, images, and metaphors), and the narrative itself (tone, rhythm, narrative coherence score) (40).

[4] Professional interpreters trained in intercultural mediation.

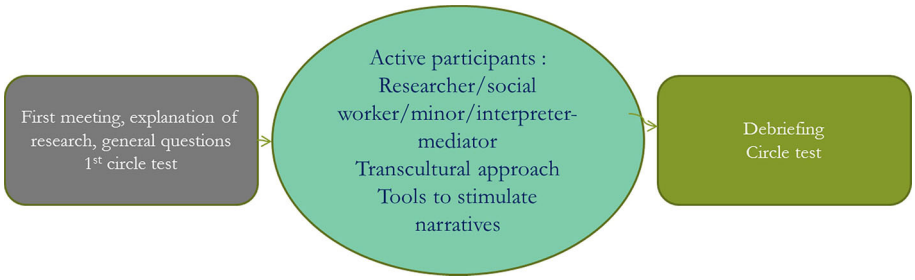

FIGURE 1 | Three semistructured monthly interviews.

The final stage of the analysis involved writing a synthesis of the results. This synthesis includes several parts, each corresponding to a stage of the analysis. That is, the substantial quantity of data generated by this study requires the presentation of the specific results for each part of the analysis. Accordingly, the analyses restricted to a specific aspect have been the topic of academic work and/or publications by members of our research group, especially the analysis of the mediation by the objects (40) or by the *circle test* (39, 41, 42, 43), the difficulty of projection into the future (44), modifications in the social worker's relationship with the youth between the three interviews (45, 46), the description of several life narratives (47–54), and the implementation of mental health care for distressed young migrants (55–57). Here, the research group proposes a cross-sectional analysis of the data useful for the preventive management of psychological trauma.

RESULTS AND ANALYSIS

The study included 29 young unaccompanied migrants and 29 social workers. Their sociodemographic profile varied by age, sex, and geographic origin, but was representative of the overall population of these youth. They were all aged 16 to 18 years, which is the most common age group for unaccompanied youth in France. The group includes only three girls, consistent with strong male sex distribution of this group in France. Their cultural origins are representative of the recent migration flows in France: sub-Saharan Africa, North Africa, and southern Asia. The difference between the age range included and the inclusion criteria is probably due to the fact that social workers find it more difficult to work with migrant youth approaching their 18th birthday (because they receive care and support from the Bureau of Child Welfare only until then, except in exceptional situations). That is, the youth and the social worker must adjust/adapt to each other even more rapidly (language learning, administrative issues, entry into a rapid training program to be able to support him- or herself at the age of 18 years) and the challenge of support is still more complex. The social workers accordingly offered this study most often to these older youths.

Of the 29 subjects, 21 completed the three successive interviews. Two youths were unable to complete the second and third interviews due to severe psychiatric decompensation related to stressful contemporaneous events (their 18th birthdays and failure to obtain legal status). Others had to move away from Paris and leave their group home. Two ran away. Psychological distress was identified or mentioned before or during the research for 8 of 29 teenagers PTSD, depression, addictions, and somatic complaints. We then helped them to start treatment.

Their social workers also had a varied profile. Their professional experience working with unaccompanied minors ranged from 7 months to 4 years for the most experienced. They

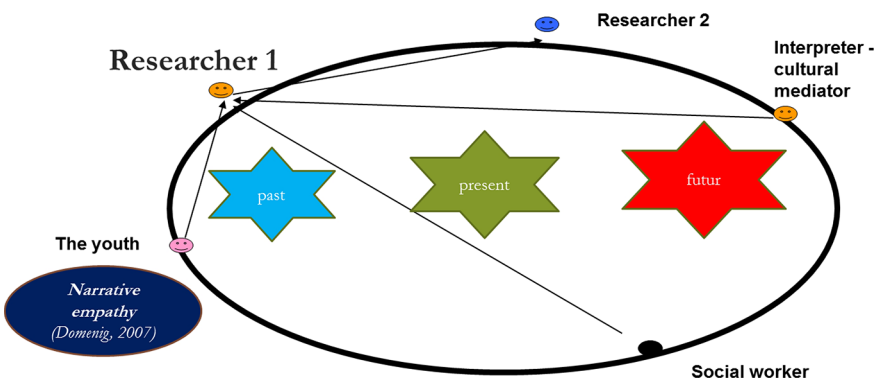

FIGURE 2 | The research program.

worked either in a group home or shelter or for an association or agency supporting youths housed in a hotel. Their decisions to suggest the youth's participation in this study were based on their impressions of not adequately understanding their young client.

The analysis of the results shows two primary types of themes (**Table 2**): those that are part of the experience of being a young unaccompanied migrant, and those related to the value of this method in promoting changes in the youth and in the relationship between the youth and the social worker.

The Experience of Being a Young Unaccompanied Migrant

A Suspended Future

For most of these adolescents, projection into the future was difficult. Their future felt suspended, subject to administrative and legal decisions, despite their hope of obtaining a residence permit, a diploma, or a job. It remained hypothetical for some, "*a hole, empty, there's no future and that's all*" for the young Y.

For three youths, especially, it was impossible to imagine an object associated with the future as long as their future remained uncertain. Nonetheless, the experience of the study and the creation of a narrative were described as positive by all of the participants who completed all three interviews. In the subgroup of youths who did not ask for psychological treatment, there was a clear positive evolution of the circle test between the first and third interviews; at the first interview, the present and future predominated, while in the second circle test, the largest circle is the future: *"an inflated future that is flying away and is filled it with important things, with a content ("women, children, parents, bank account, job*").

Inversely, the circle tests did not change between the first and third interviews for those who needed psychological treatment, and the dominant time at the first interview was always the past. Nonetheless, the narrative around these circle tests evolved each time it was given: from a "transient present to a supportive present", from a "past postponed to a past to be mastered," from a "future unthought of" to a future that can be envisioned." ("that of the future is bigger, I didn't do it on purpose, it just came like that by itself"). We observed two psychiatric decompensations that were essentially brief psychotic episodes, although the first interviews did not include any notable elements that might have predicted them. These youth did not have any particular psychiatric history, but both turned 18 between the first and the second interviews and found their situations extremely precarious when they were no longer under the care of the Child Welfare Bureau (they had not obtained legal status). We can talk about wandering that can induce insanity and the impact of this sword of Damocles on their 18 birthday that seems to decide their future. We helped to organize hospitalization for these two youth, who came spontaneously to our facility (not for study interviews), having evidently recognized their welcome would be kind.

TABLE 2 | Themes.

The experience of being an unaccompanied minor	- A suspended future - Religion: guarantee of continuity - Preserving one's dignity - Difficulty of escaping a sense of loneliness
Study impact	- Taking into account the experiences before, during, and after migration - From "I" to "we" - A mediator that facilitates bridges between the cultural worlds

Religion: Guarantee of Continuity

Religion and more particularly the individual's relationship to God and Islam was the theme found most frequently in these narratives. It was mentioned more specifically in discussing the past and the present. In the past, it was a link to the transmission of religious practices, by reading and, for some, learning verses of the Koran. It also testified to their membership in a tradition. At the present, it anchors them, especially as they continue, despite some difficulties, practices such as Ramadan in the host country. In most cases, God is a positive factor helping to alleviate an unknown future.

For example, Ad., from Senegal, brought a Koran for all three objects.

Describing the past, he explained, "in fact, since I was very young, I was born into it, the Koran; it's what I learned first, well before I learned French or Arabic." He had the best grades at his Koran school and was also the most adaptable of all his siblings. His father therefore chose him to go try his luck abroad.

For the present, he reported that the Koran represents a familiar object that he was able to find in France; it lets him remember who he is and encounter otherness with less anxiety. The Koran for him represents a reassuring and permanent object that helps him to face an uncertain future. He noted the importance of relying on thoughts or familiar places when one arrives in a land one does not know, with codes one has not learned. For the future, he said, he would use the Koran as a "guide for good behavior", to give him his bearings in a new world still to be decoded.

Demonstrating his detailed knowledge of the Koran also enhanced his social worker's impression of him. This simultaneously increased his own self-esteem, which is important in the creation of good bonds for these youths who often feel judged or undesirable in the host country and who thus feel their dignity attacked. Finally it allowed him to reconstruct with spontaneity a network to belong to, to feel less lonely, even to want again finally to belong to a group. At the last interview, the social worker was surprised at the changes in Ad., who was open and seemed to have more self-assurance after the acknowledgment of his worth. He was later able to join a theater group at his training center.

Preserving One's Dignity

This theme was regularly associated in the narratives with recognition of the distress these youths have experienced. They allowed themselves to express the offense to their dignity although they had not succeeded in expressing it elsewhere. For example, M., a young Congolese from a well-to-do family describes discovering on his arrival in France how low on the social ladder he was now placed. His school showed its solidarity

and found him lodgings. Nonetheless, none of the other students are aware of his situation.

> Researcher: *He has to prove his identity, who he is. There is also this impossibility of speaking it and the weight of his need for success.*
> Interpreter: *Especially in the region he's from, men cannot show their feelings. From the age of 15 years, there, he is considered a man. A man, he must not cry, he must not show his feelings. So his honor is also at stake.*
> Researcher: *He has a great deal of courage and dignity, and it is the case for many of these young minors who come from somewhere else, who suffer, but cannot tell their families their real situation in France.*

In another register, we were able to resolve a cultural misunderstanding for S., from India. He hadn't dared to express the reasons he had refused a training program in horticulture, a program his social worker was quite proud of having obtained for him. In the presence of the interpreter-mediator and with the help of the researchers, who were able to get him to talk about his Sikh origins in relation to the objects he had brought (typical bracelets), he was able to explain that the crafts resulting in dirt stains on clothing were performed only by "castes inferior" to his. He thus felt humiliated and insisted on a training program in cooking, which his social worker had not understood.

Difficulties in Escaping a Feeling of Loneliness

Loneliness was another theme often found, despite the presence of people around them.

One adolescent quoted the Algerian proverb: "*One hand does not applaud*." This experience was particularly intense in those youth who expressed psychological distress.

> "*I always feel all alone, because at the difficult moments, there is no one here for me*," F.
> This deep feeling comes from the break with family, and sometimes from the difficulty of trusting: "*The community makes everyone think about itself, not help each other, so I can't trust [anyone].*" (Al., first interview)
> "*By coming to Europe, I've left my place empty back there, I've lost my place.*" (Al.)

He thus faced an impasse: he had a vital need to be surrounded by people who care about him, but had not succeeded in meeting people he could count on in his current environment. This young Algerian was thus lost in his identity, somatizing his pain and using alcohol as an avoidance strategy.

Several teens stated that they do not want to worry their families, already in need. This aggravated their feelings of isolation, of loneliness. They have demonstrated their sensitivity to acknowledgment and recognition of their journey to uphold their dignity.

> Interpreter: *"It's El Dorado, that's exactly it. You think that in arriving here, you just have to ask and you get. The problem with all that, it's that the people who have immigrated here, who succeeded here, when they return to their country, they live like pashas, and that makes people think that in France, there's a lot of money. So when people leave from there to come here, they think they're going to El Dorado. Unfortunately here, there's reality … All the minors I know, who I work with a lot, they often hide the problems from their family, because the family cannot imagine what happens here, and afterwards, they will worry too much. So the minor prefers to take it all on his own shoulders. But he believes that he has to succeed here and that he doesn't have the right to fail."*
> Researcher: *"It's a dual isolation."*
> Interpreter: *"And failure is forbidden."*

The semistructured interviews made it possible to reconstruct the networks to which the youth belonged. The researchers made an effort to not think of these teens as isolated, by asking questions for example about the family, even though it is absent, and through the objects. The study aimed to make these adolescents want to belong once again to a group.

Effects of This Research Program

Taking Experiences Before, During, and After Migration Into Account

The use of objects (**Supplementary Table 3**) and the circle test made it possible to avoid the cleavage of migration and, by systematically going back and forth between these three time periods, to help these adolescents recover the continuity between their past, present, and future. The items used to evoke narrative facilitated access to their life paths and their histories. They talked more spontaneously about aspects of their identity and their experience and expressed their emotions and feelings more easily than during the first interview, when they had brushed past or avoided these questions.

These youth had often passed through several countries and had had to adapt several times to different changes and risks.

> "*For example I had 7 sets of identity papers, and there were two that were in Arabic and in Spanish."*

The cleavage of migration that follows the trauma of exile often makes it difficult to have access to narratives of the past. This reached its zenith for some teens who had fantasies of rebirth:

> The documents to start his life: *"I don't believe that I'm in Paris now, for me it's incredible; it's a dream in fact; it's as if I'm not yet born, all this. (F.)*
> *"Compared with the interviews that I had before this study, there was a language barrier then. They asked me general questions about what happened in my life before, earlier. Here, the interviews, you've gone over*

my whole life. The future, I can't tell it, because I don't know what's going to happen, but my childhood, how I grew up, all those aspects were considered. It's allowed me to rewrite my history." (K).

The link between the past, present and future allowed him to construct his identity and to reactivate his psychological resources:

K: "Yes, it's clear that if you want to be a farmer, you need to be strong. There, in my country, I was someone who was a big guy.
Researcher: And you're not anymore?
K: Yes, I'm still strong!"

For those youth who mentioned psychological distress, the use of objects as part of the interview had a dual effect: of holding and of transformation. These objects thus helped the teens to jump-start the process of narrativity.

The objects chosen for the past were often memory objects, those of the present useful objects and those of the future something proving the youth's membership in French society. For the past, music was the object mentioned most often, but each piece of music was related to these youths' personal experience ("*what he says speaks to me, the songs about kids like me*", in reference to Cheb Bilal, a singer himself exiled for 12 years without legal documents), a personal experience that is part of the country's collective history (Crazy Soldier denounces the violence and the political situation of the country that M. had to leave to survive). Sometimes the object testifies to the trauma experienced and the migration (the dinar and the wound).

The objects of the present were most often utilitarian things associated with lodging, training programs, or learning French. These responses were less personal, but had a greater social valence. For the objects of the future, most mentioned obtaining a diploma, a "Young adult contract", a residency permit, or French nationality.

For several youths, the choice of objects helped them to find a meaning to their fragmented pathway during which dreams were sometimes lost, replaced by discouragement. Accordingly K., who said that he had almost given up describing his route at the first interview, used as his object of the present at the second interview a drawing he made of himself with a beard to show that his departure far from his family served as a journey of initiation, a rite of passage. "*I started to shave, a deep shave. I have a little beard, hairs, to say that I'm older, so I can find a job.*"

Sometimes the choice of object helped in the coconstruction of a project shared with the social worker. Thus the young F., a young orphan from the Congo whose parents died in a traffic accident, said in her first interview that she is not motivated by her current schooling plan (providing personal services). During the second interview, she brought a fabric representing the 6 provinces of the Congo for the past, a choice linked to the cloth worn by her mother when she left on business. She then changed her plans and chose to study commerce. This cloth also allowed her to describe the distress and particular strengths of only daughters (her mother was also an only daughter) and to talk about her kinship line.

We also note that transcultural questions related to naming or food were especially strong generators of narrative.

From "I' to "We"

Leaving the Sense of Loneliness Behind Between the First and Third Interviews

The discourse concerning the objects, the circle test, and the narrative developed in collaboration with the researchers and the social workers showed an evolution between the first and last meeting for the experience of isolation and loneliness.

Specifically, we note a greater prevalence of the use of "I" by these adolescents, to describe their distress, an "I" that is closed, trapped ("*I am inside*"); it evokes their loneliness (the social worker's help seems disembodied). This "I" is organized around the "we", with the collective and the peer groups in the old country, or around a "one" still more undifferentiated, in the present time, when they identify themselves with migrants or unaccompanied minor foreigners. They are becoming part of another peer group, not from their country of origin, but a mixed group of youth who have had similar pathways, at the same time that they were different. In the future, the "I" regularly becomes "one" when associated with a pathway that is organized in close association with their social worker. For some, this connection also takes place within larger social groups, that of friends from different training programs and for others around the other youths at the shelter they live in.

During the third interview, in many cases, a connection had clearly been established at the interpersonal level with the youth (in particular by the social worker). "*You helped me, all of you. When I come, I'm soothed, I sit down," "before, I was taking rivotril (clonazepam) and now I don't take it any more since I started with you*" (young Algerian, third interview). Another young Algerian was finally able to formulate a request for assistance to his social worker (the terms "*help,*" "*need,*" and "*one*" are repeated at the third interview).

Several circle tests by themselves represented an evolution toward adoption of the values of the host country, probably addressed to the social worker and part of a process of cultural métissage. Let us illustrate this by the story of the young Malian, B., included in the study because he seemed to be isolated and to express a sadness and somatizations likely to affect his plan to learn to be a plumber. We learned from the mediator during this first circle test that this youth dreaded drawing a circle (**Figure 3**). The words for circle or *round* in Bambara and Soninké are "*korri,*" which is translated literally as "enclosure," a closed space: closing someone in a circle or turning him around it is considered a bad omen. He therefore drew the future in the form of deployed wings.

His circle test at the third interview was in the shape of three round, regular circles about the same size (**Figure 4**). He wanted to write the times in French in the circles. He thus expressed his ability to close them in the circle without fear that this would affect him later. We note greater confidence in his future, which is no longer vulnerable to bad omens or evil eyes, although they were previously likely to shut him in and prevent any progress. During this cycle of interviews, he succeeded in describing some

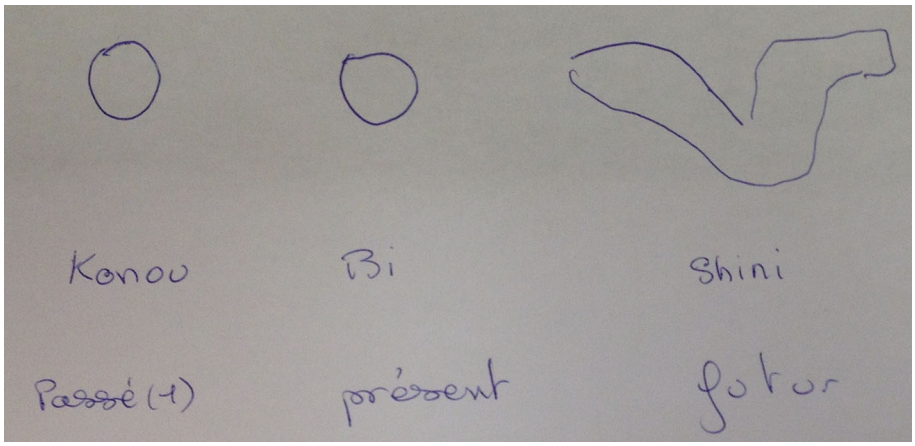

FIGURE 3 | First circle test of a young malian (B.).

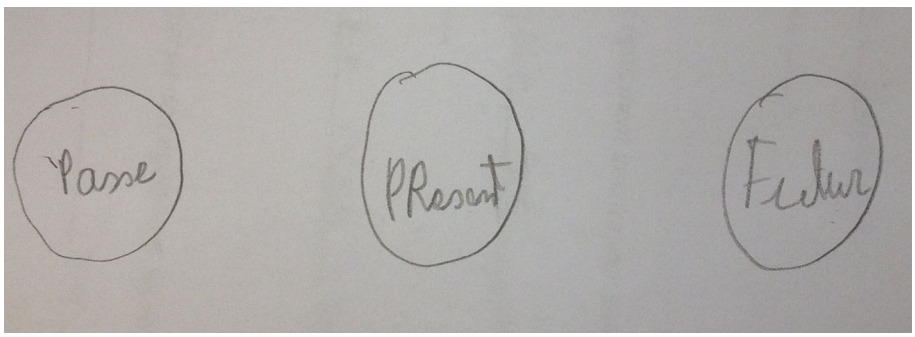

FIGURE 4 | Second circle test (B.).

aspects of his history. The social worker was able to describe in detail the difficulties in management that flowed from their professional positions and the youth's shift in relation to the representations he had had of the concept of adolescence.

Talk About Oneself so That the Teens Can Talk About Their Own Cultural Representations in the Form of Exchanges, Conversation, and Sharing

This dialectic around the successful meeting might have occurred because the research process had enabled multidirectional mutual knowledge: between the teens and the social workers, between the social workers and the researchers-clinicians, and between the teens and the researchers-clinicians.

At the first interview, many of the social workers expressed their lack of knowledge of the youth, despite their intention to know him and to be engaged in his care.

> *"I'm supposed to know him," "I have the impression that I don't know him." (social worker of T. from Morocco and of Al., from Algeria)*

The youth were on the whole sensitive to the changes in their social workers. Some social workers had shared experiences from personal journeys or anecdotes with other youth. The young migrants looked at their social workers more as humans, now that these professionals were more exposed in relation to their position to otherness and their own experiences of decentering.[5] Behind the professional is the human, and there is a cultural being who cannot from the outset know all of the youth's cultural codes; and vice versa. Some social workers revealed themselves in some ways, while remaining professional: that is, they exposed themselves as professionals at the right dose, showing a little bit

[5] Decentering is a process of flushing out the position that denies cultural otherness and sanding down or eroding human complexity by reducing from the unknown to the known. It's about leaving behind "cultural commonplaces." Professionals must "decenter" themselves from their own representations to avoid interpreting through a single prism, which can lead to errors or overgeneralization. Experiences traveling or working in transcultural situations make it possible to recognize that there are many ways to think of social work and care or treatment, all of them valid in some ways or situations.

more of their identities, of their relation to the minors' countries, their knowledge of the cultural universes to which they belonged, etc. This self-revelation was possible because it was initiated or encouraged by the researchers. This enabled the lifting of a cultural taboo: what one can allow oneself to say (or not). In truth, these youth are sensitive to others' authentic interest in them, their culture, their cultural identities, and there is less self-censorship and more willingness to allow oneself to express one's ignorance or doubt about the other's culture. It involves learning from the other so that the other would like to learn from us.

> Researcher: "*What do you get from working with this young man?*"
> Social worker: "*It's cultural enrichment. It's true that Pakistan, I didn't know it very well, or its history or its past, or any of that. So it's true that it's a cultural exchange that is very interesting. And then after, from a personal point of view, the choice of the profession of social worker, it's also personal enrichment, that's why you choose this profession, generally.*"

Mirroring this "humanization" of the social workers in the eyes of these young people is the personalization of the social work care and the humanization of the youth's record:

K.'s social worker was able to underline his chaotic pathway and submit to the judge a solid case proving both that he was a minor and that his situation was very precarious. She was especially proud to have succeeded in humanizing his file to make the judge more aware: "*The fact that we showed K.'s pathway, everything that was done here at the Maison de Solenn, all that allowed us to humanize his file for the judge."*

Acknowledge the Challenge of Integrating and Adapting to a New Society, a New School System, a New Social Environment With Unfamiliar Codes

We find the recurrent theme of the recognition of the youth's suffering and the paradoxes of the system (subthemes of the relation to the policy world); this leads social workers to sometimes share the adolescents' agitation and confusion, but without their impotence.

> "*Arriving here, I discovered the reality. They told me a little that it was difficult down there, but I thought it was stories. But I've seen with my own eyes that it's not stories, it's reality, unfortunately*" (K., in his first interview, in which he described his voyage, during which he was treated badly across several European countries; nonetheless he reported that one of the greatest difficulties has been this precariousness at his final destination).

The recognition of the difficulties of the present was an essential stage and a prerequisite to developing a narrative that included the past. Those who did not need mental health care were better able to give a thoughtful character to their ordeals without being afraid of retraumatization by recounting it. This recognition also enables the initiation of a conversation on the relation to norms: in the present, related to what these teens want to take from their peers to construct their identity at the level of their affiliations but also what they think that adults in the host country expect of them and their fears of misunderstanding as they seek integration and respect. They must simultaneously consider not only who they are and who they want to become, but also what adults expect them to be. A particular fear is related to religion, which has been transmitted by their ancestors and is part of their filiation for the construction of their identity. The researchers regularly show that these two movements can be reconciled.

> Social worker: "*In our association, it's our principle to accept each person in their own culture, in their differences, with their past and their experience. Concretely, it's respect for their religion.*"

For these youth, hearing that explicitly stated by someone who works in an institution of the Republic enables them to recount their affiliations, without self-censorship. It is not, on the other hand, mentioned in this way when interviews are conducted in a more formal, more administrative framework, on the subject of support. The young man here responded:

> "*For a while I was at a hotel, I was allowed three meals a day and they gave me Halal meat. Another kid was in a different social work sector and his social worker said to him from the beginning: " now, you are in France, you need to eat like the French do.*"

Assuming a Mother-Child Relationship

A maternal representation was quite regularly attributed to the social workers in this study. We might apply the concept of a good-enough mother, described by Winnicott[6] in the mother-baby relationship. In these situations, it may involve a substitute mother able to meet these young people's needs and support them in their progressive discovery of their new world. After a period of wandering in France, the social worker is their first stable reference, and it is by and through the social workers that these youth begin to discover the world in France in small doses. These institutional representatives/mediators thus provide a "presentation to the world" together with their framework for interpreting it to the youth; they support these young people in an environment that is culturally unknown and perhaps traumatizing in this setting of migration.

Accordingly one mediator reported a strong and emotional relationship between Al. and his social worker, but also the impression that he envisioned his relationship with her as unchangeable: *"He has a very strong relationship with her, at the same time as … it's as if he were sure of keeping her with him."*

They sometimes compared their social workers directly to a mother:

> "*Like my mother because there are things she says to me, my mother also said to me" (unaccompanied youth from the Congo)*

[6] Winnicott D. La mère suffisamment bonne. Paris: Payot & Rivages; 2006

> "*He considers her like a mother and with all the respect and what goes with it." (unaccompanied youth from Guinea).*

It should be noted that in some cultures, it is sometimes a mark of respect to designate a kind adult to whom one is close by a term designating the generation above (uncle, mother, aunt…).

This maternal identification might initially have caused surprise or discomfort to social workers, in view of the representation of the maternal bond in their own culture and the sensitive issue of emotions in their professional training:

> "*I never realized where you were putting me in relation to you.*"
> "*Here the word mother does not have at all the same meaning.*"
> "*In our profession, it is considered a professional flaw to show affection for a child, for a youth."*

For several of these adolescents, the need for a mother figure originated in a lack in their childhood family and in the need to take responsibility for themselves early on, without a family to support and shore them up in developing an ever more appropriate response to situations.

For several social workers, this feeling of discomfort evolved during the interviews and an emotional relationship with the adolescents did not become more threatening.

This was the case for the social worker of a young Cameroonian; she felt committed to a role that was not hers: "*… he put me in a very particular place, right away he said to me, I need you.*"

Later, she said: "*I'd like to say that the association took care of him; it carried him and showed him the world, perhaps as only a mother can show the world to her child.*"

But often it was the fact that the social workers were not the only professionals dealing with the child that made it possible for them to take on this emotional relationship. Here it was the association or voluntary agency that is treated as the parent. Sometimes a social worker mentioned that another social worker shared responsibility for the case. We can imagine that being the only person to "hold" the especially loaded history of an adolescent who is massively invested in a transference creates the risk of too great an investment by the social worker and too great a fascination, which is not neutral. In the study, things happened as if it required the gaze of a third party (the researcher) who has also heard the youth's story for the social worker to take on this relationship with the youth and to know that it was possible without any role confusion. The agency offers itself as the "good-enough mother" where after the perfect adjustment sought by the social workers, they move toward progressive separation. The objective is to enable an exit from the state of dependence that these teens may have toward their social workers, without inducing unbearable anxieties for them, and thus avoid inflicting yet another of the ruptures they have experienced so many times along their journeys. The team can thus maintain a representation of the agency's containment without its physical presence.

Sometimes, it is the research setting that evokes a reassuring familial ambience: *"he feels as if he's at home, with family and he talks as if he's with family"* (mediator).

A Mediator Who Facilitates Bridges Between Cultural Worlds

Social Workers Who Use Interpreters Rarely

The analyses of the self-administered questionnaires and of their experience of the study, as reported at the last interview, show that social workers are not used to using professional interpreters, even though they recognize that the language barrier is one of the principal difficulties. Language is one of the themes that appears most often in the transcripts. It is through language that we see the prism of the world. Nonetheless, the social workers only discovered during these research interviews the specific languages these adolescents had mastered.

> " *I met B. and we didn't need an interpreter to talk because he spoke French, and I wasn't curious about it; because I started and I didn't know what it could refer to, ethnicity, the village, the origins; I said to myself that I had everything in the report…" (a social worker)*

The social workers used interpreters as mediators even less often, unaware of the value they provide in this role.

We can see this in the situation of T., a young Algerian who talked so much that his logorrhea left his social worker at a professional standstill ("*Because he talked to me so so much at each interview, he talks, I even have trouble stopping him so I can say something*"). Attributing communication problems in part to the language barrier, the social worker arranged for someone who could translate for the first interviews of the follow-up, but this effort was unsuccessful ("*I understood nothing at all, at all."*). The function of a professional interpreter can go beyond the simple translation of words, which is already necessary for reasons of ethics and respect for the client (due to the risk that information will be lost or even deformed; there is also the problem of asking questions freely, through this filter). During this study, the teens easily grasped the value of the mediators, as the social workers observed. The mediator's presence enabled them, for example, to manipulate the languages they spoke according to function and context. For example, they often reported their history and emotions in their native language, while stating concrete facts or words intended for the social workers in French.

A Role Model for the Youth

The questions about languages and cultural group of birth were among the first questions by the researchers and enhanced the meeting from the start:

"*I found that right away, he was talking in Arabic, he was talking as if he'd met an old friend, or someone he already knew.*" (a social worker)

Mediators facilitate bridges with the country of origin. They are people who have succeeded in adapting themselves in several different universes. They are therefore adults who have succeeded their cultural métissage between here and there and who juggle between their two identities to turn them into creative wealth. They provide real help in negotiating between two cultural worlds. They are therefore figures the youth may identify with and aspire to be like. Beyond the language assistance they provide, the mediator ensures that these youths without families can dare to express their own points of view to an adult without being judged and be certain to be understood.

We also observed the importance of the continuity provided by using the same mediator for each interview.

Using the Mother Tongue Is Very Helpful for the Construction of a Multicultural Identity

Mediators help to avoid cultural misunderstandings. They are coprofessionals who take an active role in the interview and thus enable the researcher and social worker to listen more carefully. They can describe the habits and customs of the young person's place of origin.

Interpreter: "*In fact, in the Punjab region of Pakistan, it's not the same thing as in Punjab India; [in Pakistan], they don't go to school much, they do the minimum. And afterwards, the children often take over their parents' land to continue to perpetuate the tradition — farming.*"
Researcher: "*And what do they grow there?*"
Interpreter: "*It's known for raising buffalo. In Pakistan, there are cows but most often we have buffalo. We use a lot of buffalo milk. This region is well known for that, for its milk."*
The youth to the interpreter: "*that's exactly right, but how do you know that?*"
Interpreter: "*I've worked in farming and I've raised buffalo too.*"

The migrant youth thus sees that the interpreter knows the world of France well, but also the world of Pakistan; the interpreter himself migrated from there. Interpreters can thus be very useful in the function of mediators: we ask the interpreter to translate word for word but also to facilitate the sharing of cultural representations and to allow a narrative to take shape. The interpreter can actively seek to create bridges with the country and can appreciate the youth and his or her skills. This often leads the teens to feel supported in expressing themselves. Furthermore, the interpreter-mediator enables the triangulation of the relationship between the social worker and the patient. This dual relationship is not natural in some countries. It is easier to express emotions in the mother tongue than in a second language.

Mediators thus appear essential in any interview with unaccompanied minor migrants or refugees, whether they know the only the rudiments of French or speak it fluently.

DISCUSSION

Key Findings

In only three meetings, most of these situations were able to develop favorably, in the creation of a narrative, but also with the improvement of the relationship between young migrants and their social workers. The young migrants were led to unfold their story in a situation where it would not affect the definition of their status or their outcome. We did not force narratives in youths whose journeys had been traumatic, to avoid retraumatizing them, but the story emerged thanks to the organization of the framework described here. It is this framework as a whole that facilitates listening, understanding, and the youth's speaking. The group also creates a containing environment for these migrant youth whose cultural envelopes appear torn. Moreover, in many of the traditional societies they come from, there is a permanent reference to the group, and issues are resolved by several group members.

The supports or prompts for narration (objects, circle test) adapted to this transcultural interaction proved to be very useful for these young people who did not express themselves easily. The young participants understood the instructions to bring an object with them. These methods therefore made it easier to gain access to and obtain a singular representation of their histories and pathways. It also facilitated the creation of a therapeutic alliance, the first stage of the beginning of long-term psychological or psychiatric treatment. These tools enabled the interactive creation and transformation of a self-narrative for each of these young migrants and most especially for those whose ability to narrate was impeded by various psychiatric disorders and mutilated by trauma. For those less affected by the trauma, the initial explanation for why social workers did not have access to these young people histories might lie in the cleavage of migration, a phenomenon described by Nathan (58): the experience of mental separation between before and after migration for every migrant. It resembles the loss of a psychological and sensory envelope with which one decodes the exterior world and stimulates the need to create another one, like a new skin. This experience of separation can be reactivated by each new period of separation (changing of group home or lodgings, for example). The associations made between past, present, and future in this study probably worked together to facilitate the construction of these young people's identities. This takes place through the construction of an experience of the continuity of one's existence [the *self-continuity* of Chandler and Lalonde (59)]. We constantly searched for coherence in their pathways so often characterized by family separations, cultural ruptures, and changes in their care. This coherence (in finding/refinding a direction in the fragmented journey) and this life story are necessary for the construction of their identity after the experience of trauma.

New clinical practices can thus be envisioned, as part of transcultural services. Moreover, within this program, we have been able to transmit to social workers the ways we work with interpreters-mediators, which they might possibly take up in their own institutions (12). Calling upon mediators in the framework of an institution appears to be an accessible means to improve care rapidly.

One of the important results of this study is that it served as a good introduction to mental health care: both for the teens who needed it but had not yet been identified; and for those who initially refused it because they were unable to represent its environment (for example, several with problems related to addiction or somatization). This study enabled us to define preventive or transition actions to provide them with better representations of mental health care and to introduce this care if appropriate when the time is right. The most appropriate timing to screen for posttraumatic stress disorder (PTSD) is still under debate (60). Stress reactions in the first 4 to 6 weeks after the traumatic event are considered a "normal reaction to abnormal events." For psychotherapists, it is vital to start individual trauma therapy for young refugees only when it can be completed, which might be a challenge because of the insecure status of the length of their stay at a specific location.

Even though this research was not particularly addressed at a clinical population, these youth felt authorized to express their psychological distress in some situations and were able to ask for psychological care. The modality of this treatment was then explained by the mediators, and accurate representations by the youth (and the social workers) of its meaning facilitated the procedure. This research framework should make it easier to consider an analysis of the introduction of mental health care, its relevance, timing, and form. The transmission of transcultural skills to social workers can also, inversely, prevent unnecessary mental health care, especially through the use of mediation by objects and by their appropriation of this method of introducing transcultural jump-starts, through meetings such as those described in this study and conducted in a framework that facilitates the emergence of cultural representations. The introduction of an umpteenth professional (psychiatrist or psychologist in a clinical setting) for teens who have already met many (judges, police, group-home directors, social workers, group-home psychologists, etc.) can increase their confusion in identifying the roles of each, as well as adding to the number of ruptures in a pathway already strewn with them.

The question of the identification of those who do need psychological care (all do not need it despite possibly traumatic journeys) and how to introduce it is not obvious. For example, when they do need it, some young migrants refuse as part of a strategy of defense against trauma: not dealing with the past and denying anxiety becomes an adaptive coping strategy that enables them to limit their risk of collapsing into depression in the present: time splitting (61). Only a small percentage of refugees with psychological problems seeks for help (60).

Horlings and Hein (60) recommend short-term group interventions for young refugees suffering from PTSD. Group interventions have the advantage of being supportive when the problems are identifiable, recognizable, and the young people can be examples for each other. Moreover, they are less time-consuming and more cost-effective than individual treatments.

It is accordingly important to work on reassurance and the identification of the meaning of psychological treatment. Several studies have identified unaccompanied young migrants as a population at risk of developing psychiatric diseases and noted the importance of treating these disorders rapidly. Nonetheless, most of this population does not receive psychological care, and there is a dearth of studies assessing the effectiveness of treatment for them (62).

Major work on support at the sites the young migrants are housed can already be helpful; a first stage for a youth arriving in France is a place to settle and receive support to mitigate the risk of profound loneliness. It is often difficult for them to settle on arrival, with frequent and recurrent changes in housing and little time to discover a new world. We find the concept of trust central in the experience of these youth, who often describe a feeling of stigmatization and do not always feel that the various stakeholders listen to them, or even that they are allowed to talk about or practice their religion. Once their material survival is assured, depressive or posttraumatic symptoms that have been deferred may appear. The transition on their 18th birthday is another period of major psychological vulnerability, when some of these youth sometimes decompensate briefly into psychosis and require holding, in Winnicott's sense of the word, to surmount this stage.

This follow-up cannot begin without the social worker, who is often the person to whom these youth turn first, as a resource person, in whom they confide, and who can therefore help them to formulate a request for psychiatric care and can support them in this framework. The social worker must thus be integrated into this management from beginning to end, for these young people whose parents are far away.

Comparison With the Literature

There is a lack of research on screening and interventions in this specific population.

Hodge conducted a meta-analysis of 21 US studies assessing culturally sensitive interventions (CSI) for minority youth seen for violent behavior, substance use, and sometimes for physical medical problems (63). Its results suggest that currently operationalized CSIs are modestly effective with these youth. Although their results do not support the view that CSIs are more effective than standard treatments, these CSIs were tested as a first-line treatment for an entire population from a cultural minority. In our study, we suggest our intervention be used for specific indications rather than systematically. It is addressed to social workers who encounter problems in providing support services to unaccompanied foreign youth and who require specialist professional advice, as when there is a risk of a cultural misunderstanding or when the social worker has the impression that he or she does not know the youth or cannot succeed in creating a relationship of trust. Moreover, Hodge's meta-analysis does not include any analysis according to either

the youth's degree of acculturation and/or generation of migration (first or second). In our study, the youths are unaccompanied first-generation foreigners who have recently arrived. These youths have therefore undergone a recent cultural shock, and these professionals must confront the otherness that accompanies them.

According to Horvat et al. (64), such cultural competence education programs need to be better specified and described. They should set forth including their conceptual rationale, actual content, delivery, organizational support and approach to evaluation. These authors examined five randomized controlled trials from different countries to assess the effects of cultural competence education interventions for health professionals on patient-related outcomes, health professional outcomes, and healthcare organization outcomes. There was positive, albeit low-quality evidence, showing improvements in the involvement of culturally and linguistically diverse patients. Findings showed either support for the educational interventions or no evidence of effect. They concluded that uncertainty exists about the best and most effective way to educate health professionals in cultural competence that leads to improved health outcomes for cultural minorities. Here, our study describes in detail a training program in cultural competence in which the social worker works directly with the youth, together with two experts in transcultural clinical practice. During this intervention, social workers learn on several levels: the nature of the relevant questions, the framework to modify, and how to work with an interpreter as a mediator. They will later be able to call upon these mediators more easily and will no longer be alone in transcultural situations. The result here is measured in terms of the improvement in the relationship with the youth and in terms of the therapeutic alliance, and not on clinical improvement, contrary to the studies identified by Horvat, which concerned quite different types of diseases, such as diabetes and hypercholesterolemia.

Successful interventions in young refugees do not require simply psychotherapeutic treatment focusing on PTSD symptoms. Instead to improve outcomes they should consist of individual as well as supportive factors, including but not limited to (reuniting) family, schooling, integration of traditional health care, and language training (65, 66). Our study underlines the value of some of the coping strategies described in the literature. Especially important is the need to maintain continuity despite an unstable and shifting situation (67, 68). Continuity can be facilitated by the maintenance of religious beliefs and practices in the host country (69, 70). Psychological functioning is improved by peer support; feeling safe at school, lack of discrimination, and low peer violence levels enable higher self-esteem (60). Accordingly, finding familiarity and regaining one's bearings enable a transition that eases integration to the host country's values and self-construction in a harmonious cultural métissage between two cultural worlds (71, 72). We also find in the literature the need for progressive acquisition of new cultural norms and the major role of contact with peers from their culture now integrated into the host country, who have often endured very similar situations and with whom they can share their experiences (67). It is often surprising, because we transform these youth into victims by underestimating their capacity of resilience. Most often, they talk little at the beginning, because they are sad and struggling. Telling them what we know of their collective history, by direct experience or texts and readings, can transform them (73). The very idea that they can be part of a collective history lifts their self-esteem. They understand that the professionals do not perceive them as wanderers but as people who seek to transform their destinies. We must make sure that they can restore their dignity and regain a desire to participate in a community by progressing past their distrust. We must not ask them to renounce their identity and their past, but rather we should help them to construct themselves with both. Interventions should start with a public health approach, focusing on basic security, environmental and supportive factors (60).

Strengths and Limitations

This is the first study collecting the experience of 29 unaccompanied minors and providing them with detailed and original transcultural services adapted specifically to this population. A quantitative study might usefully complement this research by evaluating and assessing the impact of these services. Our idea is to adapt these services for prevention and when necessary, for treatment.

The analysis includes the eight youths who were lost to follow-up and had only a single interview because they are representative of situations of wandering. This wandering or rootlessness is often a part of the pathway of these unaccompanied minor migrants and is therefore part of our data and a result in itself. We have been able to analyze the first circle tests and what prevented a second interview. In most cases, the problems were related to the pathway through institutions and in three cases, to difficulties linked to their own errancy. Leconte explains the continuous wandering of some youth as a result of their need to pursue their route of exile to avoid encountering the moment of stability that will cause them to collapse psychologically (44).

Conclusions/Implications for Practice

This transcultural approach appears to be a relevant framework for reactivating the process of identity construction. It promotes the emergence of cultural representations, while taking experiences before, during, and after migration into account. As a preventive process, this approach also makes it possible to limit routine use of mental health care and use it instead only when necessary and when it will be most effective.

The multiplicity of the problems concerning these unaccompanied minors lends itself to a qualitative methodology to explore these complex situations. This original study protocol is simultaneously useful for these adolescents, their social workers, and researchers. The migrant youth's identity construction process is based on affiliation, belonging, and alternative affiliations (and the professional is the adult who might help to build a positive future). Professionals responsible for migrant young people must

have an active part in the therapeutic process. In a transcultural approach, therefore, we emphasize their skills, we let them build their caring capacity, and we focus on plans, procedures, and a shared understanding of their future. This study has led to the emergence of requests for training. We have thus organized a seminar in Paris and drafted a handbook for social work professionals to encourage and enhance these meetings that improve the social workers' knowledge of these adolescents and promote their successful interaction. The reception of these steps further underlines the importance of creating spaces for sharing thoughts, ideas, and interprofessional exchanges.

After the conclusion of this study, this service was resumed in the framework of the clinical and transcultural groups at the Maison de Solenn. It takes place in small groups, uses creativity and flexibility, is designed to facilitate narration, and takes special care for continuity, through the systematic presence of both the social workers and the mediator. These "transcultural jump-starts" are inspired by the transcultural group system, adaptable to different situations (74, 75) and based on the skills and uniqueness of the pathway of these children; they are intended to enhance resilience and promote the appreciation and showcasing of the heroic valence of a migration. Rather than uprooting the youth, we choose as in this study to help them in their cultural métissage and to construct new knowledge, based on their skills. Clinical work with these youngsters is often very rich. Inducing the invocation of their relatives' existence in their narratives alleviates their feelings of isolation and fosters the sense of belonging to a group. We can thus assist them in their ability to produce an inclusive narrative of a bicultural adolescence and navigate smoothly between two worlds.

DATA AVAILABILITY STATEMENT

All datasets generated for this study are included in the article/ **Supplementary Material**.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by CEERB Paris North IRB00006477. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin. Written informed consent was obtained from the individual(s)' and minor(s)' legal guardian/next of kin, for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

All authors listed have made substantial, direct, and intellectual contribution to the work and approved it for publication.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2020.00528/full#supplementary-material

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The Impact of Avoidant/Disengagement Coping and Social Support on the Mental Health of Adolescent Victims of Sexual Violence in Eastern Congo

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Introduction: Eastern Congo has been affected by armed conflict for decades while the rampant use of sexual violence has left many women and girls dealing with a wide range of consequences of sexual violence. For adolescent victims the psychosocial impact of sexual violence is devastating. However, the role of avoidant/disengagement coping and family support on the mental health impact of sexual violence remains unclear.

Methods: The study design was a cross-sectional, population-based survey in which 1,305 school-going adolescent girls aged 11 to 23 participated. Mental health symptoms (IES-R and HSCL-37A), family support (MSPSS), avoidant/disengagement (Kidcope), war-related traumatic events (ACEES), experiences of sexual violence, daily stressors, and stigmatization (ACEDSS) were administered through self-report measures. Hierarchical multiple regression analysis was carried out with mental health outcomes as dependent variables for different types of sexual violence. Finally, several ANCOVA models were defined to explore possible interaction effects of avoidant/disengagement coping and family support with stigmatization, daily stressors and war-related traumatic exposure.

Results: For girls who did not report sexual violence, *avoidant/disengagement coping* has a direct negative effect on all psychological symptoms. For victims of sexual violence, when high levels of stigma were reported, avoidant/disengagement coping possibly served as a protective factor, as shown by the interaction effect between avoidance/disengagement coping and stigmatization on mental health outcomes. In victims of sexual violence however, high levels of daily stressors combined with avoidant/disengagement strategies showed a strong increase in posttraumatic stress symptoms. Interestingly, the mental health impact of sexual violence was not mitigated by support by family members. For girls who reported a nonconsensual sexual experience without labelling it as rape and at the same time testified to have a lot of family support, there was a positive association

between stressors (daily stressors, stigma, and war-related trauma) and posttraumatic stress symptoms.

Conclusions: These results of this study underwrite to the importance of looking beyond the straightforward negative impact of avoidant/disengagement coping strategies on mental health in adolescent victims of sexual violence. While avoidant/disengagement coping can have a negative impact on psychosocial well-being on adolescent victims of sexual violence, in case of high levels of stigmatization it can as well protect them from posttraumatic stress or anxiety. Furthermore these findings speak to the importance of exploring the diversified relationship between risk and protective factors, such as avoidant/disengagement coping strategies and family support, that shape the mental health impact of sexual violence in adolescent victims.

Keywords: sexual violence, mental health, adolescent girls, coping, family support, social support

INTRODUCTION

A decade long conflict has deeply harmed and devastated the Congolese society; its population afflicted by multiple human rights abuses (1, 2). The use of strategic violence against civilians in this warring context has affected families, kinship, and community bonds, thereby pervasively disrupting social ties (3). One of these "weapons of war" is sexual violence, extensively—up until today—used as a war tactic by many armed groups in eastern Congo (4, 5). Moreover, a "normalization" of rape has also been noticed, with a substantial increase of reported sexual violence by civilian perpetrators (6, 7). However, different forms of sexual violence by civilian perpetrators are often silenced, due to socio-cultural norms and the prevailing discourse framing sexual violence as a weapon of war (7). This could also influence how victims label an experience of sexual violence. Even when women undergo sexual experiences that are legally considered as rape, many of them will not label it as such (8–12). This labeling of an unwanted sexual experience has important implications for victims' mental health, although findings about the direction of this impact are inconsistent (11, 13–16). Nevertheless, overall, experiences of sexual violence have highly detrimental effects for victims' mental well-being (11, 17–20), irrelevant of how it is labeled. Victims of sexual violence in war-torn eastern Congo has shown that both girls who label a nonconsensual sexual experience (NCSE) as rape as well as those who do not label their sexual violence experiences as "rape," report very high levels of psychological symptoms (21).

The large variation in mental health consequences of sexual violence (22) has led many scholars to investigate factors that might impact mental health. Risk factors of other war-related traumatic events, daily stressors, and (widely reported) negative social reactions have been identified as contributing to mental health outcomes of sexual violence in war settings (20, 22, 23). Recent studies point in particular to how the various ways victims of sexual violence are stigmatized, rejected, and excluded has a detrimental effect on their mental health (20, 21, 24–26).

However, there is a scarcity of literature investigating the impact of possible protective factors, such as coping and social support, for adolescent victims of sexual violence in (post) conflict contexts.

Coping mechanisms are the cognitive and behavioral strategies applied when faced with stressful events (27). Coping strategies have been described in different ways, but are generally positioned into two dimensions, namely, approach/engagement strategies (cognitive or emotional activity toward a stressful event or object or the emotional or cognitive reaction a person has to it; e.g., problem solving, cognitive restructuring) versus avoidance/disengagement strategies (cognitive or emotional activity away from a stressful event or objector the emotional or cognitive reaction a person has to it; e.g., distraction, social withdrawal) (28). Approach strategies have been associated with fewer psychological symptoms and a smoother recovery after sexual violence (29, 30). In general, while avoidance strategies may be considered adaptive to reduce the stress directly after the traumatic event, in the long term they could lead to more mental health problems (29, 31–33). This is also applicable in the case of victims of sexual violence (33–36). Research with adolescent victims of sexual violence has illuminated that victims of sexual violence have a tendency to use avoidance strategies (37), and that this is even more so for victims who label their NCSE as rape in comparison to victims who do not label it as such (11). While studies in nonwar affected areas have strongly supported these findings, namely, that avoidance coping is associated with more psychological problems, some studies, especially in war-torn areas, have generated evidence that avoidance can lead to fewer psychological problems such as depression and anxiety (31, 38). A study of Mels and colleagues (39) assessing the impact of coping on mental health issues in eastern Congolese adolescents found that avoidance/disengagement coping was associated with a reduction in symptoms of posttraumatic stress and anxiety in older adolescents. However, the particular role of avoidant/disengagement coping in the mental health of adolescent victims of sexual violence has not yet been investigated in (post) war contexts.

Social support—"the availability of components of support from interpersonal relationships" [(40):1273]— has generally shown to be a protective factor for mental health outcomes of sexual violence (41, 42). Also, family support in particular can be a protective factor to the mental health consequences of rape in adolescent victims (43). Additionally, victims who label their experiences of sexual violence as rape have been shown to look for social support more often (11). However, in (post)conflict contexts, such as eastern Congo where rape is used as a weapon of war to rupture social ties, the disturbed family and community support structures are often still too weak to provide victims of sexual violence with the support they so greatly need (23). Being raped decreases a girl's marriageability, and thus risks having economic and social consequences for the family (44). While family support can have a protective effect on victims' mental health after sexual violence, the adverse impact of negative social reactions on victims' mental well-being might be even stronger (40, 45–47).

This study, therefore, strives to increase the understanding of the use of avoidant coping and family support as well as the impact on the mental health of adolescent victims of sexual violence living in the distinct setting of war-affected eastern Congo. Hereby also taking into consideration their association with the following risk factors: daily stressors, war-related traumatic exposure, and stigmatization. From these findings, implications for interventions will be drawn.

METHODS

Participants and Procedure

The study was conducted in the current province of Ituri, in Eastern DRC, a region where armed conflicts have caused havoc for the last decades (1, 48). While acknowledging that also boys face considerable levels of sexual violence in this region (49), this study focuses on adolescent girls. This choice was made in close collaboration with the local expert team guiding this study. A boy's responses could be highly influenced by taboos regarding sexual violation of boys, rendering this method (self-report measures in a classroom setting) less applicable for boys. Across the large region of Ituri's main city, Bunia, 22 secondary schools in all 10 neighborhoods, were selected using stratified sampling in relation to location (rural, suburban and urban regions). All of the selected schools agreed to participate. Per school all the female pupils from the second and third year of high school were invited, informed and consented to take part in the study (n = 1,304). Of the participants, aged 11 to 23, with a mean age of 15.89 (SD = 1.54), 14.0% (n = 183) of the sample confirmed being raped, while 24.2% (n = 315) of the sample mentioned having experienced a NCSE which they did not label as rape (**Table 1**). Some socio-demographic differences were found between the three groups (**Table 1**).

The questionnaires were administered during a 60–90 min class period, while the boys of the respective classes were engaged in other activities organized by the teacher. A description of the study was provided to the participants followed by obtaining written informed consent. During the completion of the self-report questionnaires, the researcher and a research assistant or two research assistants were present. Questionnaires were administered in French, since this is the official language in secondary schools, and a pilot study showed that the students preferred French questionnaires over the translated Kiswahili versions. Questionnaires were self-administered while thoroughly guided and structured by the research assistants. To promote interresearcher reliability 90 h of extensive theoretical and practical training was provided to all research assistants. The researcher provided her contact details to participants, as well as information on local psychological support projects for those in need of further professional care. The researcher had a large network of professional psychosocial professional services that were used to refer participants of this particular study to. Ethical approval for the study was given by the Ethical Committee of the Faculty of Psychology and Educational Sciences, Ghent University.

Measures

Six self-report questionnaires, all culturally adapted and some constructed for use in eastern Congo (50) were administered. First, a socio-demographic questionnaire investigated variables such as age, housing situation (as an indicator of participants' socio-economic status), and parental availability.

TABLE 1 | Socio-demographic characteristics and stressful experiences of the participants.

	Total group (n=1,304)	No sexual violence (n=806)	Rape (n=183)	Nonconsensual sex (n=315)	F/χ^2
Age†	15.89 (1.54)	15.73 (1.49)	16.34 (1.51)	16.04 (1.63)	13.90**
Socio-economic status					21.08**
Brick house	600 (46.4%)	404 (50.5%)	86 (47.5%)	110 (35.3%)	
Nonbrick house	693 (53.6%)	396 (49.5%)	95 (52.5%)	202 (64.7%)	
Parental availability					20.20**
Both parents alive	781 (78.93)	486 (80.7%)	103 (67.8%)	192 (79.0%)	
One or both parents deceased	216 (21.7%)	116 (19.3%)	49 (32.2%)	51 (21.0%)	
War-related traumatic exposure (ACEES)†	2.83 (2.43)	2.19 (1.90)	4.71 (3.05)	3.16 (2.45)	86.62
Daily Stressors (ACEDSS)†	5.34 (3.31)	4.57 (2.98)	7.78 (2.98)	6.08 (3.11)	201.12*
Stigmatization (ACEDSS)†	3.95 (3.45)	2.82 (2.50)	7.53 (4.28)	4.90 (3.37)	200.33

*N(%); †Mean (SD); *p < .01, **p < .001; Rape, participant who reported experiences of rape; Nonconsensual sex, participants who reported nonconsensual sexual experiences, but did not label these as "rape"; ACEES, Adolescent Complex Emergency Exposure Scale; ACEDSS, Adolescent Complex Emergency Daily Stressors Scale.*

Second, the Adolescent Complex Emergency Exposure Scale (ACEES) was used, as it was developed to measure exposure to potentially traumatic war-related events in eastern Congolese adolescents (50). The ACEES measured exposure to 14 context-specific potentially traumatic war-related events (yes/no), such as having witnessed people being killed, being separated from family and having witnessed rape. In addition to this questionnaire, specific questions regarding experiences of sexual violence were added. Besides the question "Have you experienced rape?", the questionnaire was comprised of four questions referring to other forms of sexual violence or coercive sexual experiences: being forced to have sex with a boyfriend, being forced to have sex with someone you know, being forced to have sex in exchange for goods, and being forced to marry. These four forms of coercive sexual experience are all mentioned as being "sexual violence" in 2006 Congolese legislation (51).

Third, the Adolescent Complex Emergency Daily Stressors Scale (ACEDSS) (50) inquired about a range of different daily and social stressors (stigmatization) and whether or not they occurred during the past month (yes/no). This included 14 daily stressors (e.g., lack of food or medical care), and 14 stigmatization items (perceived discrimination and social exclusion in the familial and community context) (e.g., being treated as if you were different, being isolated by the nuclear family, being treated badly by family members). These stigmatization items were initially derived from the Everyday Discrimination Scale (52), and adapted to this particular cultural context following the procedure of Mels and colleagues (50).

Fourth, perceived social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) (53), a brief self-report measure of subjective assessment of social support. This measure was adapted to the cultural context through the cultural adaptation procedure of Mels and colleagues (50). The scale comprises of 12 items that are scored on a five-point Likert scale, ranging from 1 (not at all) to 5 (a lot), and accompanied by a visual probe. The MSPSS measures the perceived adequacy of support of family, friends, and significant others through three subscales, offering the mean scores of items belonging to the subscale. In the interest of answering the research questions, we only retained the family subscale in further analyses. Cronbach alpha of the MSPSS was measured and proved adequate for all three subscales: friends (.70), family (.77), and significant other (.76).

Fifth, coping strategies were measured using the Kidcope (54), which was previously culturally validated for use with eastern Congolese adolescents by Mels et al. (50). This brief instrument uses 11 items to inquire about the use of 11 different coping strategies (e.g., distraction, social withdrawal, wishful thinking, problem solving, emotional regulation, and social support), by asking respondents to indicate on a four-point Likert scale [from 1 (not at all) to 4 (almost all the time)], how frequently they have applied them during the past month. Subscale and total scores were calculated, as was the two-factor structure proposed by Cheng and Chan (55) of escape-oriented coping (sum of subscales: distraction, social withdrawal, self-criticism, blaming others, wishful thinking, resignation, emotional outburst) and control-oriented coping (subscales: problem solving, cognitive restructuring, social support, relaxation). This categorization has been previously used in the eastern Congolese context when studying coping in war-affected adolescents (50) and matches the engagement/disengagement (28) and positive/negative (56) dimension of coping used in coping studies. Cronbach's alpha for the avoidant/disengagement subscale was (.74), yet weaker for the control-oriented/engagement scale (.65). Therefore, we focused on the avoidance/disengagement scale in further analyses.

Sixth, symptoms of posttraumatic stress were measured with the culturally adapted Congolese (French) version (50) of the Impact of Event Scale-Revised (IES-R) (57), a diagnostic self-administered questionnaire comprised of 22 questions to be answered on a Likert scale [from 0 (never) to 5 (extremely)], accompanied by a visual probe. Items can be grouped into three subscales (symptoms of intrusion, avoidance, and hyperarousal). Cronbach's alphas in this study were between.77 and.83.

Seventh, the culturally adapted Congolese (French) version (50) of the Hopkins Symptom Checklist-37 for Adolescents (HSCL-37A) (57) measured symptoms of anxiety (12 items), depression (13 items), and externalising problems (12 items). All items had to be answered on a four-point Likert scale [from 1 (not/never) to 4 (always)], accompanied by a visual probe. Cronbach's alphas in this study were between.60 and.85. The externalizing scale with a low Cronbach alpha of.60 was omitted from further analyses.

Statistical Analysis

Chi square and ANOVA analysis were carried out to explore differences in sociodemographic variables and types of sexual violence for categorical and continuous variables respectively. Differences between mental health outcomes (HSCL-37A and IES-R) for different types of sexual violence were investigated through ANOVA analysis. Odds ratios were considered to measure differences between groups of type of sexual violence concerning potentially traumatic war-related events. Pearson correlations between covariates were calculated for each group based on the type of sexual violence experienced.

Hierarchical multiple regression analysis was conducted respectively, as dependent variables, with: HSCL-37A subscales of depression and anxiety; the IES-R subscales intrusion, hyperarousal, and avoidance; and the total IES-R posttraumatic stress score. The number of daily stressors (ACEDSS) and war-related traumatic events (ACEES) were entered at stage one of the regression analysis in order to control for these potential risk factors. Stigmatization (number of social stressors; ACEDSS) was entered at stage two, avoidant/disengagement coping (Kidcope) at stage three and family support (MSPSS) at stage four. Prior to model fitting, variables were standardized. To avoid complexity, models were fitted to three subsets of the data based on the experiences of sexual violence (no sexual violence experienced, sexual violence labeled as "rape," sexual violence labeled as "nonconsensual" sexual experiences), resulting in three times six hierarchical regression models.

Finally, several ANCOVA models were defined to explore the main effects and possible interaction effects of avoidant/

disengagement coping and family support with daily stressors, war-related traumatic exposure and stigmatization on the different mental health outcomes. Again, covariates were standardized prior to the analyses.

To control type-I errors, alpha was set at.01.

RESULTS

Socio-Demographic Variables and Stressful Experiences

38.2% (n = 499) of adolescent girls who participated in this study reported being a victim of sexual violence. The remaining 61.8% (n = 806) did not report any form of sexual violence. Socio-demographic characteristics of the three groups of participants (i.e., those who did not experience sexual violence, those who did label the sexual violence as "rape," and those who reported experiences of sexual violence but did not label it as "rape") and the stressful events they experienced (i.e., war-related traumatic events, daily stressors, and social stressors/ stigmatization) are reported in **Table 1**.

Analysis shows that girls who report rape and girls who report NCSE also report more potentially traumatic war-related events than girls who never experienced sexual violence. **Table 2** shows differences between groups on the experiences of potentially traumatic war-related events. Some potentially traumatic war-related events are reported considerably more by rape victims than by NCSE or girls who never experienced sexual violence such as having been in imprisoned, having been kidnapped and enrolled by an armed group, having been forced to kill, injure or rape someone or seeing someone being raped.

TABLE 2 | Potentially traumatic war-related events.

	Rape (n=183)	Nonconsensual sex (n=315)	χ^2 (df=2)
Have been separated from family	1.85	2.18	29.38**
Have witnessed violent acts against family members or friends	2.17	1.72	16.29**
Had family members or friends violently killed during the war	1.92	1.19	15.76**
Experienced pillage or setting your house on fire	2.56	1.14	30.15**
Experienced gunfire attacks	2.65	1.74	41.06**
Have seen somebody being killed	2.34	2.20	45.92**
Have seen dead bodies or mutilated bodies	3.21	1.67	53.79**
Have been injured during the war	7.56	2.75	79.69**
Have been in prison	48.18	9.11	183.22**
Have been enrolled in an armed group	50.76	18.22	95.73**
Have been kidnapped by an armed group	19.17	2.99	165.01**
Have been forced to kill, injure or rape someone themselves	8.45	1.42	85.67**
Have seen someone being raped	5.08	2.56	72.79**
Total traumatic exposure (regression coefficients as obtained from ANOVA)	2.43	1.01	96,59**

$^{**}p < .001$.

Coping Strategies, Family Support and Mental Health

Levels of mental health issues (symptoms of anxiety, depression, and posttraumatic stress) (HSCL-37A and IES-R), avoidant/ disengagement coping (Kidcope), and family support (MSPSS) for the three groups are reported in **Table 3**.

Pearson's correlations suggested that avoidant/disengagement coping was also correlated to war-related traumatic exposure, daily stressors and stigmatization in both girls who did not report any sexual violence and girls who reported rape (**Table 4**). For all three groups, girls who report sexual violence, girls who report NCSE and those who not report any sexual violence, there is no significant correlation for war-related traumatic exposure, daily stressors, and stigmatization. Strongest correlations were found between stigmatization and daily stressors.

The Impact of Coping and Family Support on Mental Health

Multiple regression analyses (**Table 5**) demonstrated a positive impact of stigmatization on girls' mental health, specifically for those girls reporting NCSEs and those girls who did not report any experiences of sexual violence. This means that the more girls are stigmatized the more mental health problems they report. The results suggest that for girls who report NCSE, the more stigma they experience the more PTSD symptoms they report. For girls who do not report any sexual violence, we found that the more stigma they report, the more depression and anxiety they experience. No main effect of stigma was found in rape victims.

The change in R^2 from model 2 to 3 showed that avoidant/ disengagement coping explained a substantial amount of variance to the previous models, in particular for girls who had not experienced sexual violence and girls who reported NCSEs. For girls who reported rape, avoidant/disengagement coping only led to more symptoms of hyperarousal (IES-R),

For all participants there is a significant positive effect of avoidant/disengagement coping on symptoms of depression and anxiety (HSCL-37A). This means the more avoidant/ disengagement coping they apply the more depression and anxiety (HSCL-37A) symptoms they report.

There is a positive effect of avoidant/disengagement coping for girls who do not report sexual violence and to a smaller extent for girls who report NCSE. Avoidant/disengagement coping has a strong positive effect on avoidance symptoms (IES-R) for all three groups. In addition, a strong positive effect of avoidance coping on hyperarousal symptoms (IES-R) for girls who report rape.

The change in R^2 from model 3 to 4 showed that family support explained some variance compared to the previous models. Family support shows a strong positive effect on intrusion symptoms for girls who report NCSE. A strong positive effect of family support is also found for PTSD symptoms in girls who report rape. This means rape victims who report more family support also report more PTSD symptoms. In addition, we found a small negative effect of

TABLE 3 | Mental health, family support, and coping.

	Total group (n=1,304)	NSV (n=806)	Rape (n=183)	NCS (n=315)	F
IES-R					
Intrusion	1.82 (.69)	1.71 (.63)	1.83 (.69)	2.09 (.79)	35.94**
Avoidance	1.92 (.72)	1.80 (.70)	2.06 (.68)	2.14 (.76)	29.09**
Hyperarousal	1.87 (.74)	1.71 (.68)	2.08 (.67)	2.15 (.83)	51.19**
Total PTSD score	1.87 (.65)	1.74 (.61)	1.98 (.57)	2.12 (.71)	17.55**
HSCL-37A					
Depression	1.68 (.35)	1.61 (.33)	1.76 (.36)	1.77 (.37)	29.20**
Anxiety	1.76 (.37)	1.71 (.37)	1.79 (.37)	1.85 (.38)	17.18**
Family support (MSPSS)	3.02 (1.01)	3.10 (1.05)	2.85 (.81)	2.96 (1.00)	5.29*
Avoidant/adjustment coping (Kidcope)	1.80 (.52)	1.70 (.48)	2.03 (.54)	1.95 (.53)	50.22**

*Mean(SD); *p < .01, **p < .001; NSV, participants who reported no sexual violence; Rape, participants who reported experiences of rape; NCS, participants who reported nonconsensual sexual experiences, but did not label these as "rape"; IES-R, Impact of Events Scale-Revised; PTSD, posttraumatic stress disorder; HSCL-37A, Hopkins Symptom Checklist-37 for Adolescents; MSPSS, Multidimensional Scale of Perceived Social Support.*

family support on depression for girls who do not report any sexual violence.

Further exploration of the impact of avoidant/disengagement coping with ANCOVA-analyses showed that there were interaction effects between avoidant/disengagement coping and stigmatization in victims of sexual violence (both girls who report as girls who report NCSE) for symptoms of posttraumatic stress and anxiety (**Table 6**). In lower levels of avoidant coping, the relation between stigmatization and psychological symptoms is slightly positive; when reported avoidant coping is high, the relationship between stigmatization and psychological symptoms is strongly negative (**Figure 1**).

In the effect plots, the lower plots are associated with a higher number of avoidant/disengagement coping while the higher plots suggest a higher level of avoidant/disengagement coping. The interaction effects found between avoidant/disengagement coping and daily stressors in victims of sexual violence (rape and NCSE) were: when low avoidance coping was reported no association was found between daily stressors and posttraumatic stress symptoms (IES-R); while in high levels of avoidant coping a positive association was reported between daily stressors and symptoms. In contrast, interaction effects of avoidant/disengagement coping with war-related traumatic exposure for victims of rape on symptoms of intrusion (IES-R), depression, and anxiety (HSCL-37A) were: when low levels of avoidant coping were noticed, there was a strong positive relation between war-related trauma and symptoms; while a reverse relationship was observed in high levels of avoidance coping.

Overall, there seemed to be a limited impact of family support on participants' mental health, as also indicated by the variability accounted for between the third and the fourth models (**Table 7**). Higher levels of family support were significantly associated with symptoms of intrusions in girls who reported experiences of sexual violence.

Further analyses indicated that for girls who reported NCSEs there was a strong interaction effect between family support and stigmatization on hyperarousal symptoms (IES-R): for victims who reported low levels of family support, stigmatization was not significantly associated with higher hyperarousal symptoms; while for girls with estimated high levels of family support, an increase in stigmatization was strongly associated with an increase in hyperarousal symptoms (**Figure 2**).

For girls who reported rape, an interaction effect was found in intrusion symptoms (IES-R) between family support and daily stressors: there was no association between family support and intrusion symptoms when little daily stressors are mentioned; however, when reporting higher levels of daily stressors, an increase in family support was associated with higher levels of intrusion.

In the group of girls who reported NCSEs, analyses showed interaction effects between family support and war-related

TABLE 4 | Pearson correlations between several independent and dependent variables.

		Daily Stressors	War-related trauma	Stigmatization	Family support
War-related traumatic exposure (ACEES)	Total group	.358**			
	NSV	.310**			
	Rape	.186			
	NCSE	.235			
Stigmatization (ACEDSS)	Total group	.520**	.317**		
	NSV	.394**	.223**		
	Rape	.554**	.044		
	NCSE	.410**	.245**		
Family support (MSPSS)	Total group	−.064	−.007	−.071*	
	NSV	−.009	.029	−.058	
	Rape	−.059	−.084	−.162	
	NCSE	−.076	.089	.110	
Avoidant/ disengagement coping (Kidcope)	Total group	.249**	.249**	.258**	.125**
	NSV	.209**	.210**	.170**	.177**
	Rape	.304**	.264**	.394**	.098
	NCSE	.033	.062	−.007	.131

*p < .01, **p < .001; NSV, participants who reported no sexual violence; Rape, participants who reported experiences of rape; Nonconsensual sex, participants who reported nonconsensual sexual experiences, but did not label these as "rape"; ACEES, the Adolescent Complex Emergency Exposure Scale; ACEDSS, Adolescent Complex Emergency Daily Stressors Scale; MSPSS, Multidimensional Scale of Perceived Social Support.*

TABLE 5 | Multiple hierarchical regression analyses.

	IES-R												HSCL-37A					
	Intrusion			Avoidance			Hyperarousal			PTSD Total			Depression			Anxiety		
STEP 1	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS
War trauma	.35**	.23**	.44**	.29**	.18**	.25**	.34**	.25**	.34**	.36**	.24**	.38**	.23**	.19*	.22**	.21**	.20**	.23**
Daily stressors	.26**	.00	.32**	.26**	.06	.30**	.29**	.20**	.35**	.30**	.08	.35**	.29**	.06	.31**	.27**	.04	.33**
R^2	.22**	.09*	.27**	.15**	.08*	.17**	.23**	.21**	.23**	.23**	.14**	.27**	.18**	.07*	.15**	.12**	.07*	.19**
STEP 2																		
War trauma	.34**	.22**	.40**	.27**	.18*	.24**	.33**	.26**	.30**	.34**	.24**	.35**	.20**	.20**	.19**	.18**	.20**	.22**
Daily stressors	.23**	.06	.21**	.21**	.06	.27**	.26**	.13	.27**	.26**	.09	.27**	.21**	−.05	.24**	.19**	−.00	.30**
Stigma	.10	−.09	.28**	.17**	−.01	.08	.10	.10	.23**	.14*	−.02	.22**	.30**	.17	.19*	.26**	.06	.08
Delta R^2	.01	.01	.05**	.01**	.00	.00	.01	.01	.03**	.01*	.00	.03**	.05**	.03	.03*	.03**	.00	.00
STEP 3																		
War trauma	.30**	.22**	.39**	.23**	.15*	.22**	.28**	.19**	.29**	.30**	.21**	.33**	.17**	.16*	.18*	.16**	.16*	.21**
Daily stressors	.20**	.06	.20*	.18**	.07	.26**	.22**	.10	.26**	.22**	.08	.26**	.19**	−.06	.23**	.18**	−.02	.30**
Stigma	.07	−.10	.29**	.14*	−.04	.09	.07	.00	.23**	.11*	−.06	.23**	.29**	.10	.19*	.25**	−.01	.08
Avoidant coping	.22**	.01	.17*	.24**	.23*	.33**	.27**	.35**	.18**	.27**	.16	.26**	.16**	.23*	.17*	.13**	.23*	.15*
Delta R^2	.05**	.00	.02*	.05**	.04*	.11**	.07**	.12**	.03**	.07**	.03	.06**	.02**	.04*	.03*	.01**	.05*	.02*
STEP 4																		
War trauma	.30**	.24**	.37**	.23**	.16*	.22**	.28**	.20**	.29**	.30**	.22**	.33**	.17**	.15	.18**	.16**	.15	.21**
Daily stressors	.20**	.05	.24**	.18**	.07	.27**	.22**	.10	.26**	.22**	.07	.28**	.18**	−.06	.23**	.18**	−.02	.29**
Stigma	.07	−.06	.26**	.15*	−.03	.09	.07	.02	.23**	.11*	−.04	.21**	.28**	.07	.20*	.25**	−.02	.09
Avoidant coping	.23**	−.03	.15*	.23**	.21	.33**	.27**	.33**	.18**	.27**	.13	.25**	.17**	.26*	.17*	.13**	.24*	.15*
Family support	−.03	.23	.19**	.02	.08	.04	.00	.09	−.00	.00	.16*	.09	−.06*	−.14	−.01	−.01	−.08	−.03
Delta R^2	.00	.03	.03**	.00	.01	.00	.00	.01	.00	.00	.02*	.01	.01*	.01	.00	.00	.00	.00

**p <. 01, **p <. 001; NSV, participants who reported no sexual violence; Rape, participant who reported experiences of rape; Nonconsensual sex, participants who reported nonconsensual sexual experiences, but did not label these as "rape."*

TABLE 6 | ANCOVA analyses exploring the impact of avoidant/disengagement coping on mental health.

	IES-R												HSCL-37A					
	Intrusion			Avoidance			Hyperarousal			PTSD total			Depression			Anxiety		
	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS
Intercept	0.01	−0.08	0.15*	0.18	0.06	0.09	−0.02	−0.08	0.16*	0.00	−0.02	.14*	0.03	−0.06	0.08	0.05	−0.10	0.09
Stigma	0.09	−0.08	0.27**	0.16**	−0.05	0.09	0.09	−0.01	0.21**	0.12*	−0.07	.21**	0.29**	0.11	0.25**	0.25**	0.00	0.09
War-related trauma	0.29**	0.24**	0.37**	0.23**	0.14	0.23**	0.28**	0.19**	0.27**	0.29**	0.22**	.33**	0.17**	0.20*	0.15*	0.15**	0.18*	0.23**
Daily stressors	0.22**	0.12	0.15	0.18**	0.07	0.23**	0.23**	0.10	0.23**	0.24**	0.10	.22**	0.18**	−0.03	0.18*	0.18**	0.03	0.26**
Avoidant coping	0.28**	0.35*	0.22**	0.28**	0.10	0.32**	0.31**	0.24	0.25**	0.32**	0.27	.29**	0.17**	0.42*	0.09	0.12*	0.49**	0.09
Stigma * avoidant coping	0.07	−0.27*	−0.15*	0.02	0.01	0.00	0.04	−0.06	−0.18*	0.05	−0.17	−.10	−0.02	−0.00	0.02	−0.10	−0.18	0.08
War-related * trauma avoidant coping	0.06	−0.17*	−0.11	0.11	−0.06	−0.04	0.06	−0.03	−0.09	0.88	−0.11	−.09	0.10	−0.19*	0.12	0.08	−0.16*	−0.01
Daily * stressors avoidant coping	0.07	0.17	0.28**	0.13	0.22	0.12	0.04	0.19	0.22**	0.05	0.21	.22**	−0.03	−0.02	0.12	0.06	0.12	0.10
Overall explained variance (r^2)	0.28	0.17	0.39	0.23	0.18	0.29	0.31	0.38	0.33	0.32	0.21	0.39	0.23	0.18	0.24	0.17	0.16	0.24

**p < .01, **p <. 001; NSV, participants who reported no sexual violence; Rape, participants who reported experiences of rape; NCS, participants who reported nonconsensual sexual experiences, but did not label these as "rape"; IES-R, Impact of Events Scale-Revised; PTSD, posttraumatic stress disorder; HSCL-37A, Hopkins Symptom Checklist-37 for Adolescents.*

traumatic exposure on all posttraumatic stress symptoms: when low levels of war-related trauma was reported, there was no association between family support and posttraumatic stress; while in high levels of war-related traumatic exposure, an increase of family support was strongly associated with posttraumatic stress.

DISCUSSION

Over one-third of adolescent girls in this study reported having experienced sexual violence. While sexual violence clearly impacts adolescent girls' mental health, a considerable variation in trauma symptoms can still be observed. This study

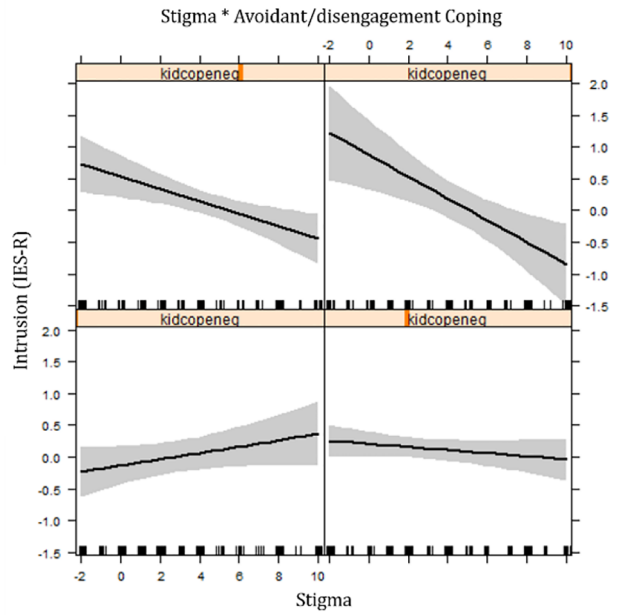

FIGURE 1 | Effect plot showing interaction between avoidant/disengagement coping and stigma on intrusive symptoms for rape victims.

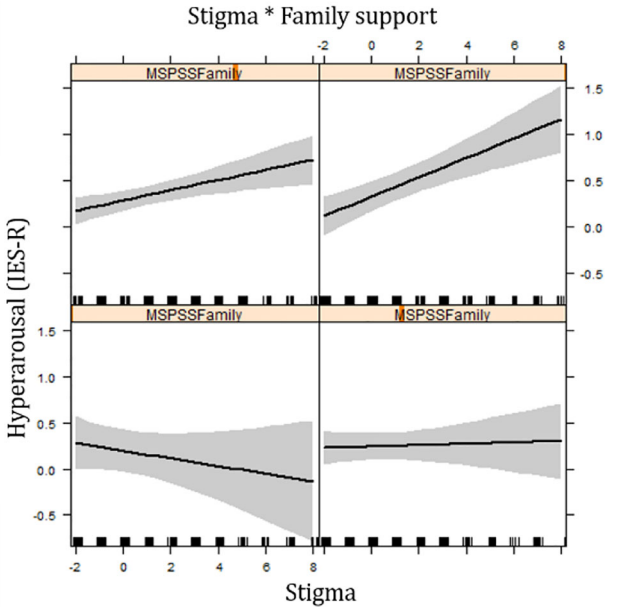

FIGURE 2 | Effect plot showing interaction between family support and stigma on hyperarousal symptoms for girls reporting NCSE.

investigated the potentially protective role of avoidant/disengagement coping and family support for adolescent girls in Eastern Congo who reported they were victims of sexual violence (either "rape" or "NCSEs"), in comparison with girls who did not report any sexual violence. While this study underscores the role of both avoidant/disengagement coping and family support in girls' mental well-being after sexual violence, it also revealed important interactions with other factors, like stigmatization.

First, for girls who did not report any experiences of sexual violence *avoidant/disengagement coping* has a direct negative effect on all psychological outcomes, which underscores the well-documented negative effect of avoidant/disengagement coping on psychological distress (29, 31–33).

TABLE 7 | ANCOVA analyses exploring the impact of family support.

	IES-R									HSCL-37A								
	Intrusion			Avoidance			Hyper-arousal			PTSD total			Depression			Anxiety		
	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS	NSV	RAPE	NCS
Intercept	0.01	−0.10	0.20**	0.01	0.03	0.18	−0.04	−0.11	0.17*	−0.00	−0.06	0.20**	0.02	−0.07	0.13	0.05	−0.13	0.12
Stigma	0.10	−0.05	0.23**	0.18**	0.00	0.05	0.11*	0.14	0.19*	0.14**	0.01	0.18*	0.30	0.17	0.19*	0.27**	0.07	0.07
War-related trauma	0.34**	0.21**	0.36**	0.27**	0.07	0.22**	0.32**	0.25**	0.28**	0.34**	0.23**	0.32**	0.20	0.17*	0.20**	0.18**	0.17**	0.21
Daily stressors	0.23**	0.09	0.24**	0.22**	0.02	0.28**	0.26**	0.14	0.26**	0.26**	0.11	0.29**	0.21	−0.02	0.24**	0.20**	0.02	0.30
Family support	0.03	0.18	0.18**	0.08	0.17	0.07	0.08	0.14	−0.00	0.07	0.18	0.10	−0.03	−0.05	0.02	0.02	0.02	0.00
Stigma* family support	0.02	−0.00	0.06	0.04	0.02	0.04	0.04	0.03	0.17*	0.36	−0.01	0.08	0.01	0.08	−0.10	0.03	0.03	−0.02
War-related trauma* family support	0.03	−0.06	0.18**	0.02	−0.02	0.17*	0.02	−0.06	0.28**	0.28	−0.06	0.22**	−0.02	−0.14	−0.02	−0.00	−0.11	0.14
Daily stressors* family support	0.01	0.23*	0.05	0.00	0.03	0.05	0.02	0.15	−0.02	0.01	0.18	0.04	−0.00	0.06	0.02	−0.00	0.07	−0.30
Overall explained variance (r^2)	0.22	0.17	0.39	0.17	0.11	0.21	0.24	0.28	0.37	0.25	0.20	0.37	0.21	0.13	0.19	0.15	0.10	0.20

**p < .01, **p < .001; NSV, participants who reported no sexual violence; Rape, participants who reported experiences of rape; NCS, participants who reported nonconsensual sexual experiences, but did not label these as "rape"; IES-R, Impact of Events Scale-Revised; PTSD, posttraumatic stress disorder; HSCL-37A, Hopkins Symptom Checklist-37 for Adolescents.*

However, a more nuanced picture about the influence of avoidant coping was found in girls who reported experiences of sexual violence. An interaction effect between avoidant/disengagement coping and stigmatization on different mental health outcomes (posttraumatic stress symptoms and anxiety) was found. This means that when the girls experienced little stigma, avoidant/disengagement coping seemed to impact mental health negatively. Although, when girls reported high levels of stigma, avoidant/disengagement coping seemed to serve as a protective factor, as it is associated with a lower level of psychological symptoms. One possible explanation here is that stigmatization accounts for a continuous revictimization (58–60), creating a situation in which avoidant/disengagement coping is seemingly an adaptive way to deal with these overwhelming emotional responses (38, 61, 62). A qualitative study in Eastern Congo (63) corroborates these findings, describing how adolescent girls identified the advice to cope with sexual violence and its social consequences in an avoidant way as the most helpful strategy to overcome their psychological difficulties. These findings also add to a more nuanced perspective on avoidant coping that goes beyond a traditional divide of avoidant coping being either harmful or helpful (64).

In contrast with the impact of a high number of experiences of stigmatization we found that in girls who experience high levels of daily stressors, avoidant/disengagement coping strategies were associated with a strong increase in posttraumatic stress symptoms. So, in the case the victim finds herself in a situation of overwhelming material and situational daily stressors, it adds an additional burden and thoroughly affects their mental health. At the same time, it might not necessarily retraumatize the victim or make them relive the trauma creating a situation of prolonged and recurrent traumatization in which avoidant coping might be adaptive and lead to less posttraumatic stress symptoms, as is the case in stigmatization. Furthermore, we hypothesize that avoidant coping might not be very helpful when confronted with high levels of daily stressors, as they pervasively influence their primary needs.

Second, the study showed how girl victims of sexual violence experienced less *family support* than peers who had not experienced sexual violence. In contrast with other studies, we found no main protective role of family support for the mental well-being of girls who experienced sexual violence. These findings thus support studies that point to the complex role families play in supporting victims of sexual violence in (post) conflict settings (65). One hypothesis here could be that the social support questionnaire (MSPSS) did not fully assess all of the socio-cultural meanings of social support (66). Moreover, the MSPSS mainly included emotional support, while recent qualitative studies revealed that adolescent victims of sexual violence in eastern Congo defined social support from family members through a combination of instrumental and emotional supports (23, 63). It is possible that the situational demands, reflected through the numerous daily and social stressors, require a social support that is more instrumental than emotional. Potentially the large presence and activities of humanitarian and development organisations across the region (44) could contribute to a conceptualisation of support and needs in an instrumental way. A second hypothesis is linked to other findings that demonstrated how avoidant/disengagement coping might be an adequate response when dealing with both sexual violence and high levels of stigma or traumatic exposure, a coping strategy that might not be compatible with emotional family support. In addition, sharing pain and difficulties might make the victims feel the pain of their adversity more intensely, and, consequently, be associated with more mental health problems (67).

We also found interaction effects that revealed a more complex role of family support with symptoms of posttraumatic stress, in particular for girls who reported NCSEs: when girls report high levels of support from their family, there was a positive association between stressors (daily stressors, stigma and war-related trauma) and symptoms of PTSD, while this was not the case when low levels of family support were indicated. Interestingly, these interaction effects were not found in girls reporting rape.

One possible explanation for both the main as interaction effects of family support could be that these girls reported higher levels of stigma, not only from the larger community but also from family members. It might be the case that confounded stigmatization or rejection by family members might render family support less helpful for these victims of sexual violence. A recent study with victims of sexual violence in Eastern Congo also pointed to the positive association of emotional support seeking and stigma and symptoms of depression and PTSD (68). Punamäki (69) found that inconsistent social support from parents was related to higher levels of posttraumatic stress disorder, compared to children who perceived overall loving support from both parents. Moreover, sexual violence not only impacts the victim, but also her close social environment (23). In a context where there is still a large stigma attached to sexual violence, disclosure of sexual violence could greatly affect family members' well-being and social position, impeding them from providing social support to the victim (70). Hobfoll and London (71) also proposed the notion of the "pressure cooker effect," referring to the way, especially in times of armed conflict, social support might backfire. Here, Hobfoll and London (71) point to the way in which social relationships are put under pressure in times of war, as conversations are inundated by recurring rumors, impending doom and needed comfort referring to war, while close intimate social support providers are also struggling with the same problems and, therefore, unable to provide adequate support. Furthermore, providing social support may confront family and community members with their own sense of guilt and shame for failing to prevent what happened to their own daughter or neighbour (67).

Limitations

It is also important to consider limitations to this study. First, the socio-cultural context in which coping and social support occur may influence the strategies utilized, the extent to which they are (mal)adaptive, and their specific cultural understanding. The questionnaires used, although culturally validated, may not have

captured all socio-cultural meanings and interpretations of these protective factors. We recommend future studies that also include further qualitative explorations of the cultural and contextual representation of concepts as social support and coping.

Second, the post-conflict contextual realities directed us toward a cross-sectional study design. A longitudinal study would have provided information on participants' previous psychological well-being and on the long-term influence of adherence to particular coping strategies or reliance on family support.

Third, while sexual violence was assessed in different forms (rape, NCSEs), the reported figures are most likely an underestimation of the true extent of sexual violence experienced by the participants. Research has shown that sexual violence is often underreported in the war-ridden region as victims fear accusation and stigma (72–74). On the other hand, there is a possibility that for some respondents their reporting of sexual violence was informed by an expectation of material compensation. However, throughout the study it was repeatedly stressed that no material compensation was connected to reporting.

Practical reasons and logistics made that only school-going girls were included in the study, this might diminish the study generalizability to out-of-school adolescents.

Implications

An ecological approach to mental health sequalae of sexual violence in adolescent victims in a war-ridden setting like eastern Congo is scarce. Building on the findings of this study, we seek to formulate important implications for further research and intervention.

First, our study shows that the effect of avoidance/disengagement coping on mental health outcomes of victims of sexual violence is not linear, nor fixed. Second, the flexible adaptation of coping strategies by adolescent girl victims of sexual violence speaks to the adoption of flexible approaches in providing psychological care. As situational demands and factors, such as daily stressors and stigmatization, are strongly associated with the use of coping strategies, psychological support needs to consider these extra burdens on victims' mental health. Further research on other coping strategies, beyond avoidance/disengagement coping, would be crucial to further the comprehension of coping strategies that could be addressed in psychological care initiatives.

Third, while these results suggest that family support might not serve as a protective factor for mental health in most adolescent girls, we plead not to discard family support in the ecological investigation of risk and protective factors on mental health outcomes of sexual violence. We thus plea for more interventions addressing the psychosocial well-being of family and community members in order to support them to create an adapted supportive environment for their victimised family and community members. Above all, we urge for further investigation of the nature of "adaptive" or "helpful" family support in the complex process of recovery from sexual violence, hereby taking into account the specific socio-cultural and contextual ideas. This further investigation of the socio-cultural understanding of the mental health impact of sexual violence, as well as the role of social and family support and other protective resources, should inform local support initiatives for victims of sexual violence. Informal care structures such as religious support groups, traditional support mechanisms and peer support groups seem to play an important role in the well-being of victims of sexual violence (63). These informal care structures and mechanisms merit further scientific explorations to inform local support initiatives.

Fourth, we suggest a holistic approach to healing when taking into account family support and coping strategies. Our research shows that victims of sexual violence face an array of difficulties, from daily stressors to stigmatization. These findings combined with the need for extensive attention to the socio-cultural meaning of social support, direct us to propose a systems approach that considers the individual definition of helpful psychosocial support. Instrumental support might in some cases regarded as more adapted to an individual victim's needs, and form more a perceived priority than strengthening emotional family support. Therefore, we think interventions supporting victims of sexual violence should include attention for instrumental needs while respecting the potential protective role of the family and their support mechanisms.

CONCLUSIONS

Over one-third of adolescent girls who participated in this study reported experiencing sexual violence. The study focused on the impact of avoidant/disengagement coping and family support on the mental health sequelae of the experience of sexual violence in eastern Congolese girls. Analysis showed that that negative coping in this postconflict setting resulted in more negative mental health outcomes, corroborating with the thesis that long-term adherence to avoidant coping increases negative mental health outcomes. In victims of sexual violence, however, the combination of having experienced sexual violence and enduring high levels of stigmatization or having been exposed to more potentially traumatic life-events created a reverse effect, where avoidant/disengagement coping leads to less posttraumatic stress. In addition, this study does not find evidence that family support is a protective factor for mental health outcomes after sexual violence. To the contrary, in girls who report NCSE we found that when high levels of family support were reported, a positive association between stressors (daily stressors, stigma, and war-related trauma) and posttraumatic stress symptoms exists. The study underscores the importance of further scientific investigation into the complex role of coping and family support in the mental health consequences of sexual violence in adolescent victims.

AUTHOR'S NOTE

The study described in this manuscript is part of a large-scale quantitative study conducted in Eastern Democratic Republic of the Congo (DRCongo) with 1304 school-going adolescent girls. The aim of the larger doctoral study is to further evidence base on the psychological and social consequences of sexual violence toward adolescent victims in the war-affected region of Eastern

DRCongo. A first published study by Verelst, De Schryver, Broekaert, and Derluyn (21) focuses on the association of how war-affected adolescent girls label sexual violence (rape or NCSEs) and their mental health. This study documents the impact of different risk factors such as daily stressors and stressful life experiences on the mental health sequalae of sexual violence. A second publication (20) drawing on the large quantitative data set focused on the stigmatization and showed that in this population the mental health impact of sexual violence is largely explained by stigmatization.

This particular study indeed builds on the previous studies but has a distinguished novel focus. While the methodology to the study overlaps with previous studies because the dataset it describes is to some extent the same, the analysis and focus are distinct. This study zooms in onto the role of two risk and protective factors to the mental health impact of sexual violence. Avoidant/disengagement coping is generally perceived as a risk factor and family support generally perceived as a protective factor for mental health outcomes of sexual violence. In none of the previous studies these factors have been addressed. Some of the variables such as stigma, daily stressors and war-related traumatic events are also part of this study to allow for ANCOVA models that explore interaction models, hence the overlap in the methodology section with previous publications. The analysis is different than any of the other studies also shedding light on new results. These results seek to contribute to the specific evidence base on the mental health impact of sexual violence in adolescent victims related to the association with avoidant/disengagement coping and family support.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the informed consents did not mention sharing of the data beyond the research team, we will unfortunately not be able to share the dataset even upon request.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethical Committee of the Faculty of Psychology and Educational Sciences, Ghent University. 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

All authors contributed to the design of the study, the data collection and analysis and the writing up of the article.

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ORIGINAL RESEARCH
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The Transgenerational Transmission of Trauma: The Effects of Maternal PTSD in Mother-Infant Interactions

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The objective of the study was to examine the process of mother to infant trauma transmission among traumatized mothers in humanitarian contexts. We investigated the impact of mothers' post-traumatic stress disorder symptoms on the quality of the dyadic interaction by conducting a microanalysis of mother-infant interactions at specific moments when trauma was recalled, compared to more neutral moments. Twenty-four mother-infant dyadic interactions of traumatized mothers and children aged from 1.5 to 30 months Central Africa, Chad, and Cameroon were videotaped during three sequences: a neutral initial session (baseline) exploring mothers' representations of the infant and of their bonding; a second sequence, "the traumatic narration," in which mothers were asked to talk about the difficult events they had experienced; and a third sequence focusing on a neutral subject. Three minutes of each sequence were coded through a specific grid for microanalysis [based on the scales developed at Bobigny Faculty of Medicine and the work of (1)], according to different communication modalities (touch, visual, and vocal), for both the mother and the child. Impact of traumatic event (IES-R), the level of depression and anxiety (HAD) were investigated in order to have a holistic understanding of the trauma transmission mechanism. The data analysis highlighted significant differences in mothers, children and their interaction during the "traumatic narration": mothers touched and looked at the infant less, looked more absent and smiled less, and looked less at the interviewer; infants looked less at the interviewer, and sucked the breast more. The mother-child interaction "infant self-stimulation—mother looks absent" and "Infant sucks the breast—mother looks absent" occurred more often during the mothers' traumatic narrations. The "absence" of the mother during trauma recall seems to have repercussions on infants' behavior and interaction; infants show coping strategies that are discussed. We found no significant associations between interaction and infant gender and age, the severity of traumatic experience, mothers' depression and anxiety symptoms, and the country of residence. The results of the microanalysis of interaction can shed light on the fundamental role of intermodal exchanges between mother and infant in trauma transmission during mothers' trauma reactivation.

Keywords: trauma transmission, mother-infant relationships, cross modal interactions, PTSD (post-traumatic stress disorder), infants

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INTRODUCTION

Trauma exposure is extremely common in countries affected by conflicts or natural disasters. In recent years, several studies have pointed to intergenerational trauma transmission (ITT) in countries affected by massive traumatic events (i.e., Burundi, Rwanda, Cambodia, Sierra Leone) and underlined the need to understand the mechanisms of transmission, in order to limit the potential negative impact on an entire community or even region, through generations (2–5).

Several studies in recent decades have tried to explain the transmission of parental trauma to the child. Many of these studies referred to collective historical trauma: the Holocaust, September 9/11, Vietnam Veterans, the Armenian genocide, etc., in which the impact of parents' post-traumatic stress disorder (PTSD) was measured in older children or in the second generation (6–10). Various other backgrounds have been explored in the process of ITT across generations, in different contexts of populations at risk for PTSD: low-income (11), abused mothers (12), adverse Childhood experiences (13) etc. Research has highlighted several possible models that may help explain the pathways of intergenerational trauma transmission.

Kellermann (14) proposed to distinguish the process of transmission, and what is transmitted. He described four models: psychodynamic, sociocultural, family system, and biological. Since this paper, two directions have been especially explored. Biological models have tried to understand the intergenerational transmission of stress (15) and the epigenetic mechanisms of stress and trauma transmission (16). Another set of studies concerns how the infants' sociocultural and family environment, the parents' representations, behavior and patterns of communication with their infant, can be considered as important factors involved in the process of ITT, a mechanism that appears to be a complex interaction between several co-processes [Perinatal Interactional Model of ITT, (17)]. Parental PTSD is characterized by physiological and emotional dysregulation, trauma related beliefs, and avoidance/withdrawal. This impacts fetal programming, and has repercussions on parent-child interaction through social learning, and maladaptive parenting. These phenomena decrease the child's regulatory capacity, increase child distress, and can lead to poorer child mental health, which in turn participates in a vicious circle.

The attachment theory (18) offers a theoretical framework to explain how caregiving behavior is impacted by parents' traumatic experience and can directly affect the child. Parents with unresolved trauma experience dissociation phenomena. They show frightened emotional expressions to the child who is unable to make the causal link between the terror of his/her parents and the trauma. The child responds with emotional and behavioral disorganization (19) and disorganized attachment behavior (20).

Maternal cognitions and representations also impact caregiving behavior, through reflective functioning. Schechter et al. (21) found that greater maternal PTSD severity was associated with unrealistic expectations of the child and distorted attributions of child intentions. These distorted maternal mental representations of the child (22, 23) will increase the frightening behaviors in response to the child, who consequently will react with disorganized behaviors. Child distress and reactions can reactivate traumatic memories in the mother, leading to a vicious circle. This can lead to specific offspring attachment orientations, in particular to higher attachment insecurities, either anxiety or avoidance, in association to self-amplifying cycle of PTSD and attachment insecurities of parents following trauma exposure (24).

Emotional availability (25) focuses more specifically on the emotional signaling between mother and child as a major mediator of trauma transmission. High scores indicate adequate maternal emotion regulation, and the open expression of negative emotions results in lower scoring. It has been proposed as a process involved in ITT, in spite of the fact that it was not found as a mediator between maternal trauma and infant psychosocial functioning in a sample of refugee mothers (26).

The PTSD mechanism was confirmed in a recent longitudinal study of ITT, which suggested a strong effect of maternal PTSD on the attachment relationship and consequently on child development; however, the need to identify the mechanisms by which maternal PTSD has an impact on the mother-infant relationship was underlined (27). The interpersonal neurobiological model of attachment and relational trauma developed by Schore (28, 29) can help to explain maternal PTSD transmission to the infant through a mechanism involving the rhythmic pattern behind mother-infant interactions (visual, tactile, vocal), which are negatively affected when mothers are traumatized. Mothers cannot modulate their stimulation and their response to their infant's needs, leading to overstimulation or on the contrary, to neglect of the child. Both behaviors can be traumatic for the infant who will have difficulty self-regulating his affective state to protect himself from becoming overwhelmed by hyperstimulation or the absence of stimulation from the mother. In a refugee sample, mothers' intrusion and avoidance explained individual differences in extremely insensitive parenting, which had direct negative effects on children's attachment organization (26).

In line with this mechanism, through the concept of "Affective Attunement," Stern (30) proposed a pathway of transmission based on the sharing of emotional states between mother and child by means of inter-modal exchanges. D. Stern uses the term "intermodal" when in the dyadic exchanges an affect is expressed according to one modality (vocal, visual, bodily) then is "translated" and associated with another modality.

Affective attunement is a process centered on the mother's intermodal transformation of the baby's affective state. The mother tends to complement the baby's actions with gestures, gaze, and vocalizations, while the infant matches the mother's gesture behavior and perceives this as an affirmation of the continuity of his own affective state. The mother's transformation of the infant's affective state through behavior emphasizes the infant's recognition of his internal state. Traumatized mothers can transmit their negative affective states through their behavior, and these behaviors can modify the process of infant internalization of mothers' intentions.

More recently, a paradigm shift has been proposed for ITT in complex settings (war, migration). Intermediary dimensions

have been introduced between parental PTSD and their effects on parent-child relationships. When parents were less able to draw on secure attachment representations, symptoms of PTSD increased the risk of insensitive parenting in a sample of Dutch asylum seekers and refugee parents (31). It is difficult to isolate the contribution of mothers' Post-Traumatic Stress Disorder (PTSD) in ITT, as in most cases, similarities with depressed or anxious mothers are frequent.

Studies of the direct mechanisms behind the transmission of parental traumatic experience to young children through caregiving have been undertaken recently, but are still rare (6, 20, 23, 26, 27, 32–35).

To investigate trauma transmission in a population at high risk of trauma exposure, we chose population from Central African Republic (CAR), which has been affected by collective violence since 2013, forcing the population to live in internal displaced camps or to migrate to refugee camps in border countries such as Chad or Cameroon. The current study addresses the issue of psychological trauma of the mother, which occurred in her life before the child was born. The objective was to identify the direct specific processes of mother-to-infant trauma transmission in traumatized mothers in humanitarian contexts, through the comparison of inter-modal mother-child interactions, occurring during different paradigmatic moments: moments of trauma recall (possibly leading to dissociation), compared to neutral moments, using a microanalysis method. We hypothesized that mothers affected by maternal post-traumatic stress symptoms would show lower levels of availability to respond to their infants' needs and show poor or inappropriate mother-infant interactions. When faced with the traumatic experiences or their recall (36), mothers may show specific behaviors (absent gaze, disconnection from reality, etc. as manifestations of dissociative states), which will result in a lack of attunement in interactions: non-synchrony (temporal coordination) or non-qualitative contingency (lack of inter-modality) between mother and infant behaviors. We hypothesized that during the narration of their traumatic experience in presence of the child, mothers may experience episodes of dissociation, that impact the infant's reactions and the interactions between mother and infant. Observing this specific moment in comparison with a neutral moment could highlight the specific mechanisms involved in trauma transmission.

METHODS

Participants

Inclusion criteria: participants in the study were mother and child dyads in which the mothers had been exposed to traumatic events, according to criteria A of DSM V, in absence of the infant, or before the child's birth, including during pregnancy. Children were aged 1–36 months.

The recruitment took place in three African countries affected by the political crises in the Central African Republic (CAR), which started in 2013. In CAR, the sample comprised internally displaced mothers and their infants, whereas in Chad and Cameroon, the sample comprised refugees who had fled the ongoing violence in CAR.

The dyads were selected in accordance with the inclusion criteria by psychosocial workers working in the international NGO *Action Contre la Faim* (ACF) psychosocial support programs in the three countries. All the participants provided their written informed consent. Mothers were given the opportunity to ask questions to better understand the aims of the study before agreeing to take part and could refuse to continue the interview at any time.

The research protocol was approved by the institutional ethical review boards in CAR and in Cameroon, and by the "*Ministère de la Femme, de l'Action Sociale et de la Solidarité Nationale*" (Ministry of Women, Social Action and National Solidarity) in Chad.

Procedure

The mothers were invited to participate in semi-structured interviews in the presence of their infant. The interview was videotaped to allow the microanalysis of mother and child behaviors and their interactions.

A clinical psychologist interviewed each mother with her infant in presence of the psychosocial worker who was in charge of the mother's psychological follow-up in the ACF program. This option was chosen in order to establish greater trust between the mother and the investigator and to guarantee a follow up in the case of increased distress in mothers and or infants during or after the research interview. The psychosocial worker was also the interpreter, as the investigator did not speak the local languages.

To investigate the core process of trauma transmission we developed a paradigm involving different settings, which explores the mother-infant interactions during three different moments: one moment of trauma recall, and two neutral moments, in order to compare within each dyad, each dyad being its own control, the changes in mother-child interaction.

- First sequence: a neutral initial session considered as the baseline to compare the other two sessions, "before the traumatic narration." Some neutral questions explored mothers' representations of the infant and of their bonding,
- Second sequence: "the traumatic narration." Mothers were asked to answer the question: "Could you tell me something about the difficult events you have experienced?" They were invited to narrate their traumatic events with the maximum of details (nature, temporality, numbers of events, etc.) and the effect on their present life (migration, change of situation, loss of family links, mourning, etc.). This was not the first time they narrated the events as they had already done so during the psychological follow up with the psychosocial worker.
- Third sequence: "after the traumatic narration," began with the first mention by the mother of a neutral subject (i.e., the naming of the child, her projection into the future, cultural practices surrounding birth, etc.). The aim of these questions was to stabilize the mothers' emotional state.

Measures

Impact of traumatic events and Post-traumatic Stress Disorder (PTSD) symptoms of mothers were screened using the Impact of

Event Scale revised (IES-R) questionnaire (37). The scale consists of a list of 22 self-reported items assessing the perceived distress caused by traumatic events. Participants are asked to identify a specific stressful life event and then to say to what extent they had been affected during the past week on a 5-point Likert scale ranging from 0 "not at all" to 4 "extremely." The IES-R total score ranges from 0 to 88 and subscale scores can also be calculated for the intrusion (8 items), avoidance (8 items), and hyperarousal (6 items) subscales. For each of these subscale scores, it is recommended to use means instead of raw sums. The maximum mean score on each of the three subscales is "4." The IES-R is widely used for a preliminary diagnosis of PTSD (38). For the general IES-R score (calculated using summing), 33 and above represents the best cut-off for a probable diagnosis of PTSD (39). The literature shows that even though not formally validated in all the different contexts, the IES-R scale is used to measure PTSD symptoms in many cultures throughout the world (40). For this study, the French version of the IES-R was used, which has satisfactory internal validity and test-retest reliability (41).

Symptoms of depression and anxiety were measured using the Hospital Anxiety and Depression scale (HAD) (42). The HAD is an instrument for symptoms related to anxiety (HADS-A) and depression (HADS-D) composed of 14 items. Each question asks about the frequency of specific symptoms in the past week using a 4-point scale ranging from 0 (*not at all*) to 3 (*very often*). For each subscale, the cut-off identified is a point of 8/21. This instrument has been validated in both medical and general populations, and the results of a recent systematic review on screening tools for common mental disorders in low and middle income countries (43) broadly recommend using the HAD scale for depressive and anxiety disorders, as it been validated in multiple settings.

Microanalysis of Mother and Child Behaviors

We chose to conduct a microanalysis of the mother-child interaction in order to identify instant-by-instant events and the intermodality of interaction. Videotaped mother and child interactions during the interview were analyzed with an observation grid based on the Action Research Training (RAF, *Recherche Action Formation*) scales developed at the Bobigny Faculty of Medicine (44) and on the microanalysis conducted by Beebe et al. (45) on mother-infant interactions (**Table 1**). These previous studies analyzed mother/infant or mother/toddler behaviors according to the different types of communication: tactile, vocal and visual.

In addition to the distinct behavior and communication actions of mother and child, a list of possible communication overlaps, which could suggest a possible interaction, was defined. Based on the most frequently observed interactions, 28 mother-child communication modality pairs were retained for the analysis (**Table 2**).

We selected the first 3 min of each of the three moments of videotaped interview (before, during and after the "traumatic narration") for analysis.

In each sequence of 3 min, any change in behavior, among those listed in the grid shown in **Table 1**, was noted and measured in terms of duration. Interrupts of the same action lasting <0.50 s were not taken into account. The action was then coded as continuous. "Touch" was coded as such only if the gesture was intentional. Contacts between mother and baby caused by unintentional gestures were not considered. The fact that the child was sitting on the mother's lap was not taken into account in intentional tactile interactions.

TABLE 1 | Observation grid for mother and infant communication modalities.

Modality of communication	Behavior observed	
	Mother	**Infant**
Bodily	Touches the infant Touches an object	Touches the mother Touches an object Self-stimulation/ self-regulation Sucks the breast Sleeps
Visual	Looks at the infant Look at what is doing the infant Looks at the interviewer Look at the environment Looks absent	Looks at the mother Looks at the interviewer Look at the environment Looks at an object Looks at his body Looks absent
Vocal	Speaks to the infant Vocalizes to the infant Speaks to the interviewer	Vocalizes Vocalizes to the mother Vocalizes to the interviewer
Affects	Smiles Smiles at the infant Cries	Smiles Smiles at the mother Cries

The frequency and the duration of the mother-infant inter-modal interactions were coded using the open source multimedia annotator Elan, version 4.9.3 (46). The software was used to code the length of intermodal distinct behavior and interactions. Communication overlaps (see **Table 2**) were generated automatically by the Elan software. Inter-rater reliability (Cohen's Kappa) of the coding of mother and infant behaviors was calculated on a randomly selected sample of 25% of the dyads interviewed and was satisfactory ($k = 0.686$).

Statistical Analysis

Friedman's test was used for the analysis of difference in behaviors and interactions before, during, and after the traumatic narration by the mother.

The choice of a non-parametric test was made because of the small sample size. Among the non-parametric tests, Friedman's test is an ideal statistic to use for a repeated measures type of experiment to determine if a particular factor has an effect (47). The Friedman test is a non-parametric alternative to the repeated measures ANOVA when the assumption of normality is not acceptable.

In addition, to examine where the differences actually occurred, we ran separate Wilcoxon signed-rank tests on the different combinations of related groups. Spearman's correlation was used to analyse correlations between scale scores and

TABLE 2 | Grid for microanalysis of mother-infant interactions.

Mother–infant interactions
Infant touches the mother - Mother touches the infant
Infant touches the mother - Mother looks at the infant
Infant self-stimulation - Mother looks absent
Infant sucks the breast - Mother touches the infant
Infant sucks the breast - Mother looks at the infant
Infant sucks the breast - Mother looks absent
Infant looks at the mother - Mother touches the infant
Infant looks at the mother - Mother looks at the infant
Infant looks at the mother - Mother looks absent
Infant look at an object - Mother looks at what is doing the infant
Infant looks absent - Mother touches the infant
Infant looks absent - Mother looks at the infant
Infant looks absent - Mother looks absent
Infant vocalizes - Mother vocalizes to the infant
Infant vocalizes - Mother speaks to the infant
Infant vocalizes - Mother touches the infant
Infant vocalizes - Mother looks at the infant
Infant vocalizes - Mother looks absent
Infant smiles - Mother touches the infant
Infant smiles - Mother looks at the infant
Infant smiles - Mother looks absent
Infant smiles at the mother - Mother miles at the infant
Infant cries - Mother touches the infant
Infant cries - Mother looks at the infant
Infant cries - Mother looks absent
Infant cries - Mother smiles

demographic variables. All statistical analyses were performed using SPSS version 21.

RESULTS

Descriptive Results

Twenty-four mother and infant dyads met the inclusion criteria of this study. Sixteen were recruited in CAR, three in Chad and five in Cameroon. The demographic data for the 24 dyads are presented in **Table 3**.

The children's age ranged from 1.2 to 30 months [$M = 11.94$, $SD = 6.92$; Median = 10.55, Interquartile Range (IRQ) = 6.3] and consisted of 11 boys and 13 girls.

The mothers were aged between 16 and 37 [$M = 26$, $SD = 16.18$; Median = 27, Interquartile Range (IRQ) = 11]. Some mothers were unable to indicate their own age, as they did not know it. This is quite frequent in the rural contexts of countries in the field of this study. Eighty-three percent of the mothers were pregnant during the traumatic event; four children were born during traumatic situations. Only one mother was pregnant during the interview. At the time of the interview, all of the children were the youngest of the siblings. The father was present in 62.5% of the cases. His absence was due either to his death or to his disappearance, without having given any news.

Mothers had experienced multiple traumatic events. The detail for each mother is shown in **Table 3**: among the traumatic events they had witnessed the murder of their children, or husband, relatives or friends, some of them witnessed massive violence in the community and/or had been forced to leave their homes, lost all their possessions, and feared for themselves and their loved ones, etc. The time between the traumatic event and the interview was on average 16 months, with a minimum of 7 and a maximum of 31 months (Median = 13, IRQ = 11).

As shown in **Table 4**, the impact of the traumatic event was very high among mothers. In addition, they presented high rates of depression and anxiety.

Correlations Between Clinical Status and Demographic Variables

Correlations were run to assess the relationships between the clinical status (scores of HAD and IES-R scales in **Table 4**) and the main demographic variables reported in **Table 3**. Spearman's correlation coefficient was used rather than the Pearson correlation coefficient because of the small sample size ($n = 24$).

No correlation was found between scores at HAD or IES-R and the age of the mother, the gender and age of the child, the presence of the father, the fact of being primiparous and the number of children.

Results of the Spearman correlation indicated that there was a significant positive association between the severity of the impact of the traumatic event (IES-R) and the time that had elapsed since the traumatic events ($r = 0.54$, $p = 0.01$), meaning that the more time had passed since exposure to the traumatic event, the more the participants showed traumatic symptoms, in particular for intrusion ($r = 0.45$, $p = 0.05$) and hyper arousal ($r = 0.468$, $p < 0.001$), both measured through IES-R subscales.

The Wilcoxon-Mann-Whitney test was used to cross the qualitative variables with two classes such as the gender of the child, with the quantitative variable of the clinical scales. No significant differences were found between the gender of the child and the clinical profile of the mother.

A Kruskal-Wallis test was conducted to examine the differences in mothers' clinical symptoms according to the country of residence. Results indicated that the highest level of PTSD symptoms was associated with populations still living in CAR, H (2) = 8.5, $p = 0.014$.

No other clinical symptoms (Anxiety and Depression) were linked to the Country of residence.

Results of Microanalysis

Results refer to separate actions by the mother and by the infant, and to their interactions.

TABLE 3 | Demographic data of participants.

Dyad	Country	Age of the mother (years)	Age of the child (months)	Sex of the child	Number of children in the family	Type of traumatic event	Mother : pregnant during the traumatic event	Presence of the father	Raison of the absence of father
1	Cameroon	35	11	F	7	1;2;4;5	Yes	Yes	–
2	Cameroon	30	7	F	3	1;2;3;4;8	Yes	Yes	–
3	Cameroon	25	1,5	F	6	1;2;3;4	No	Yes	–
4	Cameroon	26	12	F	MD*	1;2;3;5	Yes	Yes	–
5	Cameroon	MD	6	F	MD	1;2;3;6;7	Yes	No	Disappeared
6	CAR	18	9	M	1	1;3;5;7	Yes	No	Disappeared
7	CAR	28	30	M	5	1;3;4	Yes	Yes	–
8	CAR	37	7	F	4	1;3;4;8	Yes	Yes	–
9	CAR	MD	17	M	1	1;3;4;6	No	Yes	–
10	CAR	MD	17	M	?	1;3;4	Yes	Yes	–
11	CAR	19	8	F	1	1;3;4;7	Yes	No	Disappeared
12	CAR	MD	12	F	MD	1;3;4;6	Yes	No	Dead
13	CAR	16	12	M	1	1;3;4	Yes	Yes	–
14	CAR	26	11	M	2	1;3;6	Yes	Yes	–
15	CAR	31	24	M	3	1;3;4	Yes	Yes	–
16	CAR	28	14	F	3	1;3;4;5;6	Yes	Yes	–
17	CAR	16	7	F	1	1;3	Yes	Yes	–
18	CAR	20	8	F	2	1;3;4;5;6;7	No	No	Disappeared
19	CAR	28	7	M	2	1;3;4	Yes	Yes	–
20	CAR	29	28	M	9	1;3;4	Yes	Yes	–
21	CAR	32	10	M	6	1;3;4;5	Yes	No	Dead
22	Chad	MD	12	F	3	1;3;4	No	No	He stayed in CAR
23	Chad	MD	8	F	MD	1;3;4	Yes	No	He Fled
24	Chad	25	8	M	1	1;3;4;5	Yes	No	Dead

**MD, Missing Data.*
1 Escape from gunfire, detonations, violence.
2 Migration on foot in extremely difficult conditions.
3 Exposure to combat and violence.
4 Witness to the murders.
5 Witness to the death of a family member.
6 Death of loved one due to the conflict.
7 Husband's disappearance.
8 Death of his own child(ren).

TABLE 4 | Clinical status.

Measure	Outcome	Min	Max	*M*	*SD*	Median	IRQ	Range
HAD	Anxiety	5	18	13.08	3.425	14	4.5	Clinical
	Depression	8	17	12.33	2.180	12	3	Clinical
IES-R	Avoidance	1	3	1.96	0.374	1.85	0.7	High
	Intrusion	1	3	2.36	0.687	2.55	2.6	High
	Hyperarousal	0	3	2.22	0.817	2.25	1.2	High
	Total PTSD	20	64	47.08	10.685	49.5	12.8	Clinical

Differences in the Mothers' Behaviors Between the Three Sessions

Analysis revealed the following statistically significant differences (**Table 5**): the mother spoke to the interviewer ($p = 0.030$) more during the traumatic narration than in the session after ($Z = -2.171$, $p = 0.030$); the mother touched the infant ($p = 0.001$) less during the traumatic narration than in the session before ($Z = -3.589$, $p = 0.000$) and more than in the session after ($Z = -2.886$, $p = 0.004$); the mother looked at the infant ($p = 0.018$) less during the traumatic narration than after ($Z = -3.494$, $p = 0.000$); the mother looked at the interviewer ($p = 0.006$) less during the traumatic narration than before

TABLE 5 | Differencesin the duration of the mothers' behaviors in the three sessions.

	3 min session before (a)				3 min session during (b)				3 min session after (c)				Asymp Sig.	Pairwise comparison (Wilcoxon sing-ranked test)
	Min	Max	Mean (SD)	MD (interquartile range IQR)	Min	Max	Mean (SD)	MD (IQR)	Min	Max	Mean (SD)	MD (IQR)		
Vocal interactions														
Mother speaks to the infant	0	1.1	0.08 (0.28)	0 (0)	0.8	2.3	0.18 (0.55)	0 (0)	0.3	16.6	1.37 (3.46)	0 (1.9)	*0.139*	
Mother vocalizes to the infant	0	6.3	2.61 (1.27)	0 (0)	0	0	0 (0)	0 (0)	0	0	0 (0)	0 (0)	*0.368*	
Mother speaks to the interviewer	26.4	136.7	65.23 (28.43)	58.2 (35.7)	30.03	180.7	75.02 (35.25)	63.8 (22.9)	0	104.6	55.85 (25.79)	53.1 (36.6)	***0.030****	***b* > *a*; *b* > *c****
Touch interactions														
Mother touches the infant	0	152.7	58.34 (47.07)	46.1 (79.2)	0.1	118.3	23.35 (28.71)	14.7 (-23)	0.2	164.2	52.13 (40.46)	47.2 (67.6)	***0.001****	***b* < *a**; *b* < *c****
Mother looks at the infant	0	20.03	6.57 (6.83)	3.9 (13.4)	0	14.7	3.35 (4.45)	1.6 (5.7)	0	45.1	10.68 (11.79)	7.1 (9.5)	***0.018****	***b* < *a*; *b* < *c****
Mother looks at what the infant is doing	0	46.9	8.69 (10.93)	4.9 (13.2)	0	20.6	3.66 (5.31)	1.7 (5.9)	0	39.8	6.75 (10.26)	2.2 (9)	*0.096*	
Mother looks at the interviewer	23.8	178.5	114.95 (28.12)	11.5 (48.3)	19.7	169.6	90.69 (39.53)	91 (57.1)	22.9	156.9	106.82 (37.43)	115.6 (55.6)	***0.006****	***b* < *a**; *b* < *c****
Mother looks at the environment	0	73.1	14.06 (15.55)	9.9 (13.3)	0	98.3	18.37 (26.4)	8.2 (19.5)	0	107.9	18.07 (23.61)	9.8 (16)	*0.153*	
Mother looks absent	0	145	34.78 (37.43)	22.3 (34.1)	0	146	59.17 (44.1)	50.9 (74.6)	0	119	36.8 (32.12)	25.6 (35.3)	***0.004****	***b* > *a**; *b* > *c****
Affects														
Mother smiles	0	57.9	13.0 (18.26)	4.04 (17.4)	0	47.6	3.59 (10.63)	0 (0.5)	0	77	12.15 (21.13)	3.25 (16.6)	***0.004****	***b* < *a**; *b* < *c****
Mother cries	0	0	0 (0)	0 (0)	0	88.2	3.67 (18)	0 (0)	0	0	0 (0)	0 (0)	*0.368*	

*$p < 0.05$.

TABLE 6 | Differences in the duration of infants' behaviors in the three sessions.

	3 min session before (a)				3 min session during (b)				3 min session after (c)				Asymp Sig.	Pairwise comparison (Wilcoxon sing-ranked test)
	Min	Max	Mean (SD)	MD (interquartile range IQR)	Min	Max	Mean (SD)	MD (IQR)	Min	Max	Mean (SD)	MD (IQR)		
Vocal interaction														
Infant vocalizes	0	69.2	6.24 (14.94)	1.51 (5.1)	0	70.3	10.85 (18.35)	0.85 (11.4)	0	35.1	7.29 (10.09)	1.25 (13.3)	0.532	
Touch interactions														
Infant touches the mother	0	98.7	27 (30.26)	11.51 (45.2)	0	174.3	44.21 (43.87)	31.15 (55.1)	0	167.4	46.2 (49.03)	28.8 (49.3)	0.158	
Infant touches an object	0	180.4	95.73 (68.88)	88.49 (145.5)	0	180.7	83.61 (71.66)	82.5 (152.6)	0	180.8	58.21 (66.89)	31.5 (123.4)	0.071	
Infant self-stimulation	0	179.7	21.18 (40.29)	4.03 (28.8)	0	151.2	29.45 (41.31)	9 (38.9)	0	173.1	25.21 (498)	2.65 (27.5)	0.542	
Infant sucks the breast	0	180.0	16.45 (42.76)	0 (0)	0	180.8	50.72 (71.58)	0 (100.3)	0	152.8	27.81 (51.53)	0 (42)	**0.045***	***b* > *a**; *b* > *c***
Visual interactions														
Infant looks at the mother	0	29.1	2.47 (6.12)	0.2 (1.7)	0	10.2	1.28 (2.5)	0 (1.6)	0	15.2	3.7 5 (4.71)	1.65 (5.7)	0.288	
Infant looks at the environment	0	131	39.15 (39.37)	31.8 (56)	0	122.2	43.42 (34.39)	42.85 (44.9)	0	104.2	36.32 (30.72)	27.9 (62.8)	0.722	
Infant looks at the interviewer	0	103.7	37.34 (27.94)	30.29 (31.2)	0	79.2	16.45 (20.56)	7.3 (24.3)	0	71.9	16.23 (20.1)	10.2 (26.5)	**0.001***	***b* < *a**; *b* > *c***
Infant looks at his own body	0	28.5	3.25 (6.93)	0 (3.3)	0	20	1.76 (4.39)	0 (1.9)	0	41.8	2.5 (8.7)	0 (0)	0.195	
Infant looks absent	0	64.4	24.78 (21.04)	20.4 (38.1)	0	86.9	24.78 (30.16)	10.25 (43)	0	78.9	18.59 (26.46)	3.15 (30.8)	0.364	
Affects														
Infant smiles	0	7.5	1.28 (2.25)	0 (3.2)	0	3.5	0.73 (1.17)	0 (1.4)	0	19.9	1.85 (20.06)	0 (2)	0.980	
Infant cries	0	18.1	1.8 (4.97)	0 (0)	0	57.3	4.99 (12.92)	0 (1.2)	0	86.5	8.4 (20.5)	0 (1)	0.412	

*$p < 0.05$.

($Z = -2.886$, $p = 0.004$) and less than in the session after ($Z = -2.800$, $p = 0.005$); the mother looked absent ($p = 0.004$) more during the traumatic narration than before ($Z = -2.950$, $p = 0.003$) and more than after ($Z = -3.346$, $p = 0.001$); the mother smiled ($p = 0.004$) less during the traumatic narration than before ($Z = -2.675$, $p = 0.007$) and after ($Z = -2.045$, $p = 0.041$). No other significant differences were found.

Qualitative Analysis of Mothers' Behavior

The mothers' vocal interactions with the infant were very limited; mothers were more involved in speaking with the interviewer, especially when they were recounting the traumatic event. The mothers' visual interactions with the infant were poor and more focused on the interviewer.

All the mothers touched the infant at least once during one of the three sessions analyzed. Most of the time during the interview the mother showed a neutral facial affect except for a visible change of gaze when narrating the traumatic event. Only one mother cried and 17 mothers smiled at least once, but they never smiled at the infant.

Differences in the Infants' Behaviors Between the Three Sessions

The repeated measures compared using Friedman's test revealed a statistically significant difference in (**Table 6**): "Infant looks at the interviewer" ($p = 0.001$) and "Infant sucks the breast" ($p = 0.045$). *Post-hoc* analysis with Wilcoxon signed-rank tests was conducted and showed that the infant looked at the interviewer less during the mother's traumatic narration than in the session before ($Z = -3.360$, $p = 0.001$) and they sucked the breast more during the mother's traumatic narration than before ($Z = -2.395$, $p = 0.017$). No other changes in infant behavior were significant in the three sessions.

Qualitative Analysis of Infants' Behavior

As with the mothers, very few *vocal* infant interactions were observed during the sessions. Vocalizations were generally neutral or positive. To determine the direction of the infant's vocalization, we observed the direction of gaze and / or the spatial position of the infant's body, to understand if the vocal interaction was toward the mother and/or the interviewer. Infants produced no vocalizations toward the mother or the interviewer.

The infants' *visual* interactions tended to be directed toward an object: a toy, the chair where they were seated with their mother, objects on the ground, etc. When the infant changed the direction of his gaze, it was toward the interviewer or the environment, rather than toward the mother. Touch was the most frequent communicative means used by infants. All the infants touched their mother at least once during the three sessions. In particular, the tactile interaction was more frequent during the traumatic narrative. The majority of children (21 of 24) showed self-stimulation behaviors. We included in self-stimulation broader behaviors represented by the repetition of physical movements (e.g., repetitive swaying, movement of the fingers, hands, etc.), which can be self-regulation behaviors.

Sucking the breast was included among the physical interactions and 11 infants suckled at least once during the three sessions. These infants were aged from 1.5 to 17 months ($M = 11.5$, $SD = 4.47$; Median = 12, IRQ = 4). In general, infants showed a neutral expression during the sessions. One third expressed affect by smiling or crying.

Differences in the Mother-Infant Interactions Between the Three Sessions

The repeated measures of all the 28 interactions between mother and child revealed that only two variables were statistically significant: "Infant self-stimulation—Mother looks absent" ($p = 0.045$) that occurred more during the mother's traumatic narration than in the session before ($Z = -2.999$, $p = 0.003$) and more than in the session after ($Z = -2.731$, $p = 0.006$). "Infant sucks the breast—Mother looks absent" ($p = 0.003$) occurred more during the traumatic narration than before ($Z = -2.090$, $p = 0.037$) and more than after ($Z = -2.118$, $p = 0.034$).

Correlations were run to assess the associations between the mother-infant interactions and demographic variables such as age and gender of infant, age of the mother, presence of the father, etc., and clinical status of the mothers (HAD and IES-R scores). No significant associations were found.

Qualitative Analysis of Mother-Infant Interactions

The analysis of mother and infant interactions showed very little reciprocity and contingency of interactions. Interaction in the same modality: "infant touch—mother touch," "infant vocalization—mother vocalization or speaking," "infant looks at the mother—mother looks at the infant," were rare.

DISCUSSION

The purpose of this study was to shed light on the process of mother to child trauma transmission in mothers who had experienced severe traumas in humanitarian contexts. As far as we know, this is the only study to investigate the quality of the dyadic interaction, by observing and conducting a microanalysis of the mother-infant interactions in a trauma reactivation situation. The mother-child interaction during a trauma recall situation was compared with mother-child interaction during a more neutral interview.

We found three main results, confirming our hypothesis.

The first result was that the mothers' behavior toward the child was specifically affected during trauma recall narration compared to the two more neutral moments of interaction. During the "traumatic narration," mothers appeared to be emotionally affected by memories: they touched the infant less than in the session before, they looked at the infant less than in the session after, they looked more absent and smiled less than "before" and "after" moments. Moreover, they looked at the interviewer less during the traumatic narration than before and after. This is in favor of the relevance of our setting, which tried to catch these dissociative moments. When they were faced with the trauma recall, the mothers' absent look suggested that they were re-experiencing the event and were unable to focus on the present situation and on the infant's requests. They showed

a behavioral pattern linked to the traumatic experience: they withdrew from interaction, smiled, and looked less at others, and seemed to be absent. These signs may reflect the maternal traumatic dissociation the infants face when their mother is lost in the traumatic experience. The mothers seem cut off from the present experience without being able to perceive external reality and the needs expressed by their child (48). This suggests that the mothers had difficulty in properly assessing the verbal and non-verbal expressions of infant arousal because they were overwhelmed by their own emotional state. This "absence of an appropriate response" emphasizes the transmission of the mothers' negative emotional state to the infants, who can potentially internalize this affective state as their own (30).

The majority of children in this study had no access to the direct meaning of their mother's words as they still were in a pre-verbal developmental stage, and even for those aged between 12 and 30 months, their mothers' words could not attack their symbolic world since they were not yet able to organize Internal Working Models, due to their developmental stage (49). Consequently, what is traumatic for them is more related to the absence, the lack of response to their requests and queries, which can potentially create external and internal sensory chaos (50).

The second finding is that the infants' behavior was impacted by their mothers' traumatic experience. During the traumatic narration, infants looked at the interviewer less than in the session before, and they sucked the breast more than before. Moreover, the mother-child interaction was also affected: "Infant self-stimulation—Mother looks absent" and "Infant sucks the breast—Mother looks absent" occurred more during the traumatic narration than in the other two sessions. These interactive behaviors reflect the children's coping strategies of self-regulation: they perceive these moments, and try to compensate with self-stimulation or by clinging to the satisfaction of primary needs. To suck the breast is a behavior which maintains close contact with the mother, and offers a primary satisfaction that the child does not find in the interaction. The lack of correlation between the age of the child and suckling the breast suggests that in the case of older infants (more than 12 months), this request was not simply linked to the need to be fed, but to a possible coping strategy for self-regulation in a stressful situation. These two coping strategies are efficient in providing self-comfort and limiting the negative effect of distress (51). This is in line with studies by Tronick (52), who stated that infant self-stimulation is a coping behavior that reduces stressful situations and offers self-calming, in particular when mothers are "still faced" (53). The mothers' "absent look" is a kind of ecological "still face" situation. These interactive behaviors reflect the children's coping strategies of self-regulation: they perceive these moments, and try to compensate with self-touch or by clinging to the satisfaction of primary needs. A previous research has shown that during a still-face procedure, when mothers were unavailable, infants spent more time touching themselves, supporting the regulatory and exploratory roles of infant touch, especially during periods of maternal unavailability (54).

It should be noted that, according to Main and Solomon "Indices of Disorganization and Disorientation (Main and Solomon, unpublished manuscript), the children did not show disorganized behavior during their mothers' "absence," but rather showed adaptive behaviors such as self-stimulation. Several explanations can be put forward for this. First, mothers had received psychological care from NGO psychosocial workers, which had possibly helped them to reduce their traumatic experience; our paradigm of trauma recall may perhaps not have reflected the fact that their trauma was reduced. Second, infant self-stimulation may be the first stage of coping; if the mother's "absence" is repeated, their adaptive strategies may prove insufficient to handle the mother's negative experience and may lead to internalized working models of disorganization. Third, the fact that the mothers talked very little to their child could limit the trauma transmission. Last, cultural differences might explain the way they cope with traumatic experiences. In traditional societies, children are not only raised by their mothers (55). They grow up surrounded by several caregivers, who complete the construction of the world and the child's identity. This aspect of shared mothering could be a protective factor in the transmission of trauma from mother to child. The presence of a co-mothering system could mitigate or compensate for the effects of the mother's lack of response to the child's requests when she is absorbed by traumatic intrusions.

The third finding was that there were no significant associations between interaction and infant gender and age, the severity of traumatic experience assessed by IES, and mothers' depression and anxiety symptoms assessed by HAD. This is maybe due to the small sample. Concerning age, it has however been shown (34) that the period when child locomotion develops might represent a critical time window for mother-child interaction in dyads with mothers having a history of abuse.

Not even the country of residence had an influence on the interactions between the mother and infant. The only difference was linked to the impact of the traumatic event and the dyads' country of residence. The highest level of PTSD symptoms was associated with those living in the Central African Republic (CAR). This can be explained by the fact that people living in CAR are in an ongoing extremely traumatogenic context, whereas people who migrated and are living in refugee camps are more protected against new traumatizing situations.

Despite the fact that we found a significant positive association between the severity of the impact of the traumatic event (IES-R) and the time that had elapsed since the traumatic events, neither the severity of the traumatic experience nor the severity of anxiety or depression were associated with interactive behaviors. This may indicate that among the war traumatized and refugees, the theoretical frame to understand ITT has to be enlarged. Mothers' general psychological distress, but not PTSD, was directly associated with negative parenting and child psychosocial difficulties in a sample of 291 Syrian refugee mothers in Lebanon who had been exposed to war trauma in the past (56). These results argue in favor of taking into account a broader framework for complex trauma in conflict and post-conflict areas, including the psychosocial framework, with the trauma focused approach. We did not evaluate the impact of other psychosocial conditions.

LIMITATIONS OF THE STUDY

The main limitation of the study is the size of the sample. The recruitment in humanitarian contexts involves several challenges linked to security constraints and difficulties of access to subjects. A larger sample would be more representative of the observed mechanisms of transmission and make our results more significant. However, even with the small sample, our results point to particular lines of enquiry to pursue in future studies. The cultural particularities of mother and child relationships require investigation to design an appropriate framework for analysis as a key to understanding the affection linked to behaviors and interactions. The second main limitation is the absence of a control group. But our aim was to explore how trauma recall can affect mothers' presence to the child and the way they interact with the child, and not to globally qualify the interactive mother-child process. That is why we compared each dyad in three different settings, each dyad being its own control. A control group could have allowed us to compare mother-child interaction in play sessions. But by definition, it is not relevant to explore trauma recall with mothers who have not experienced traumatization. Another limitation is the context in which interaction took place, which was set up to catch the direct effects of trauma reactivation. The mothers were probably more involved in the interview than in playing with the child; however, this setting was close to an ecologic situation of daily life. Future studies should include longitudinal observation of mother and child dyads, with control groups, to identify the long-term impact of mothers' inappropriate response impacted by dissociation, when trauma is recalled, to their infants' needs and child development.

CONCLUSION

This research is unique in its approach to mother-infant interactions: in the field explored (ITT in humanitarian contexts), by the setting (trauma recall), and by the microanalysis of interaction. Our results shed light on the process of trauma transmission, focusing on the caregiver reactions during trauma recall, and suggest that trauma affects a mother's availability to interact with her infant and to regulate his/her state of emotional arousal. The infant experiences this sudden lack of proper responses from the mother when she faces events or thoughts that trigger trauma memories, which can have an impact on the infant's perception of his/her own emotional status. A new and surprising finding was that children did not react by disorganization as has been previously described, but with self-stimulation, representing possible coping strategies in reaction to the mother's enigmatic reaction. This adaptive behavior may compensate for the mothers' psychic absence and for the lack of "attunement" between mother and child.

Our results strongly reflect the increasing need to understand trauma transmission mechanisms in highrisk populations, particularly when they live in unremitting traumatogenic conditions.

In particular, the question about self-stimulation during mother's "absence" should be considered in further longitudinal studies as this initial adaptive mechanism could lead to internalized working model of disorganization, if repeated.

To prevent or to limit the impact of maternal trauma transmission, we recommend psychological interventions with mothers, starting from their pregnancy, and continuing after childbirth during the important period for the development of the child, until 2 years. Psychological support for at-risk mothers should aim to allow them to resolve the effects of the trauma in order to limit the transmission of trauma in interactions with the child. Interventions focusing on parental skills, their sensitivity, their ability to decipher, and respond to the specific needs of their child like video feed back interventions (57) are also recommended. But psychological support, which has been proposed for mothers with children born of sexual violence (58), has to go beyond trauma focused interventions, and provide a holistic and community embedded approach that can be applied across settings.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the institutional ethical review boards in CAR and in Cameroon, and by the Ministère de la Femme, de l'Action Sociale et de la Solidarité Nationale in Chad. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

EDo was the principal investigator of this research and she was supervised by MF, MMo, CB, and LO during data collection and analysis. EDo, MMa, MMo, EDr, ML, and LO all contributed to the definition of the research methodology and contributed to the data analysis and interpretation. All authors participated in the writing and revision of the article.

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CASE REPORT
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Case Report: When Does Puberty Become Traumatic?

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Puberty provokes physiological upheaval that can be psychologically traumatic and destabilizing for the child. Before the transformations of puberty, the body is a protective vessel that acts as a stable reference for the child. A child's emotional security is derived from a sense of predictability and well-being. However, the nascent sexuality and burgeoning libido experienced during puberty can trigger unsettling changes in the psycho-affective and psycho-dynamic equilibrium of the child as he or she transforms into an adolescent. This article presents puberty as a transformative experience with traumatic impact that needs to be considered in therapy conducted with adolescents. At best, pubescent trauma can cause superficial issues in a child's adaptive abilities; at worse, it can lead to pathological symptoms. This article presents a qualitative study derived from a clinical case of an adolescent girl who expresses her pubescent suffering through social withdrawal and mutism. The study determines several symptomatic and traumatic indicators caused by the sudden physiological transformations of puberty, such as perceived breaches in a child's sense of safety and the child's ability to predict. The study also explores the feelings of helplessness, vulnerability, and aloneness that pubescent adolescents endure, which are then exacerbated by the sensed inability to turn to parents for help or peers for support.

Keywords: puberty, trauma experience, clinical situation, psychodynamical adaptation, case report, enactment, social withdrawal

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BACKGROUND

Trauma: A Complex Concept

The original physiological concept of trauma defined trauma as "a contusion that occurs in the body or a wound that may or may not break the skin." However, the psychological definition of trauma has evolved into a much more complex concept, with nuanced, differentiated, and multi-dimensional impacts that are focalized more on processes rather than on symptoms (1).

Indeed, the psychological dimensions of trauma are as diverse as the sources of trauma. The intensity of a traumatic event, the degree of vulnerability caused by that trauma, and the modalities of traumatic expression all must be considered. At the level of a person's inner reality, we find that trauma often can cause an (unexpected and violent) intrusion that disrupts a person's feeling of internal balance. Furthermore, the "traumatic dose" induced by a traumatic or stressful event also must be used as a diagnostic criterion when assessing the risks and degrees of symptomatic emergence. As such, experts are continually evolving toward defining a traumatic event according to the feeling of danger, terror, and dread that it induces rather than its factual characteristics (2).

Coping strategies and resilience with respect to trauma also vary in degree from one individual to another, and explain the range of reactions of individuals in the same population or group subjected to the same event. For example, patients diagnosed with Post Traumatic Disorder (PTSD) will express varying degrees of intrusion symptoms and alterations in cognition, mood, and reactivity, and subsequently will use varying degrees of avoidance and other coping measures to protect themselves. These variants in reactions complicate the logic of cause and effect in the face of trauma. According to linear logic, a traumatic event implies PTSD. But, poly-causal logic considers that a multitude of factors may interconnect to mitigate traumatic symptoms.

The Case for Pubescent Trauma Among Adolescents

The hypothesis presented in this study is that the sudden and abrupt transformations caused by puberty in certain adolescents can be deeply traumatic and can lead to disruptive feelings and clusters of intrusion symptoms similar to those experienced by patients suffering from PTSD. Puberty is a sensitive period impacted by trauma and stress, which confer substantial risk for the development of anxious behavior (3).

The authors of this study encounter the traumatic nature of puberty every day in our respective clinics. One particular clinical case, however, has been selected to illustrate our hypothesis that certain adolescents perceive puberty as an attack against their body with unpredictable and disruptive outcomes, including feelings of vulnerability and loss of control that must be recognized in therapy in order to assist adolescents cope with their stress and ease their pain.

Since stress mechanisms are often conflated, clinical findings can take many forms (4). Trauma is dependent on exogenous and endogenous variables. There is the external or exogenous event, to which the psychic apparatus will respond and adjust itself. Endogenously, the trauma and its symptoms arise from an internalized experience of danger that draws alarm signals and provokes anxiety, as well as instinctive excitations or perceived threats to the ego. The latter aspect of trauma is rarely considered in psychiatric literature reviews that tend to focus more on external rather than endogenous factors. The objective of this study is to highlight the traumatic impact and emergent symptoms of puberty that are endogenous, and which do not necessarily align with the more classic definitions of PTSD and ASD, yet result in similar disruptive, and sometimes severe, symptoms. Broadening the scope of traumatic experience beyond extraneous events attributed to PTSD and ASD during puberty is thus essential in order to more comprehensively understand the impact of puberty and the suffering it inflicts upon certain adolescents.

When a traumatic event causes a disruption to an individual's internal balance or presents a perceived or real threat to his or her integrity, this experience can create a rupture that impacts the subject's equilibrium and relationship to him/herself as well as to his/her environment. Additionally, an increase in unmanageable excitation accumulating in the psychic apparatus will activate the system that counters excitatory excesses. During traumatic events, this precious "principle of constancy" (5) that maintains balance, allows the individual to function normally, and to work and enjoy life, may fail. If attempts to remedy this psychodynamic destabilization with the usual means does not succeed, a disturbance in the subject's subjectivation processes may ensue, causing a phenomenological splitting of the self, disturbances to his/her consciousness (6), and invalidation of the traumatized individual's access to his/her peaceful relationship with the world.

All these indicators of trauma can be found in an analogous manner in an adolescent's experience of puberty, even if the event of puberty is not in itself external. In the case of adolescents, traumatic events can result in such destabilizing and undesirable effects of considerable intensity that they can immobilize coping strategies and repress defense mechanisms that constitute an adolescent's ability to maintain affect "under surveillance." [(7), p. 283] Psychological coping tools presented in therapy can help adolescents manage the emotional and intellectual dimensions of pubescent trauma by helping them better manage the incomprehensible, and better deal with the feelings of threats to the ego, the physical imbalances, and other such symptomatic disruptions in order to assure a proper functioning of psychic processes.

In the clinical case that is the subject of this study, we will show how puberty can induce an external, somatic traumatism that exacerbates the internal, psychic transformations of adolescence. Additionally, we will demonstrate how certain enactment symptoms during puberty represent the manner in which adolescents try to cope with and avoid the unmanageable, unbearable, and frightening internal psychic space caused by a traumatic pubescence, and how these are similar to the mechanisms used by PTSD patients to cope with and avoid the place of their traumatic experience.

Clinical Case and Therapeutic Processes: Indication, Onset, and Dynamics of Transference

S. is a slightly overweight 12-year old girl. S. is referred to my clinic[1] by her school psychologist because she is socially withdrawn and barely participates in class. S. has three siblings and seemingly does not suffer from any extraordinary issues or problems with her family. S. used to be a good student, but her grades have dropped dramatically in the past several months. She responds aggressively when pressured to speak or to participate in a discussion. Her school psychologist is worried about depression and refers S. to my clinic for an examination of her symptomatology and for psychodynamic therapy.

Establishing the therapeutic process initially is challenging because S. and her family are reluctant to cooperate. The first appointment is canceled by the parents because S. has promised "to make more of an effort." However, the school continues to insist upon the parents that they need to address their daughter's deteriorating situation at school and her increasingly anti-social behavior. When S. finally comes to her appointment at the

[1]The patient was referred to the clinic of one of the three therapists presenting this paper.

clinic, her symptoms of relational avoidance and aggression have continued for over 7 months.

In the first two sessions, S. sits silently as she and I listen to her mother's anamnesis and account of S.'s problems at school. There is no mention of any difficulties at home, although the mother concedes that S. can be impulsive and impolite when interacting with her family memers. When I ask S. to elaborate or ask how she feels about something her mother has said, S. avoids responding to me directly and instead tries to correct her mother's narrative by whispering to her.

The dynamics of this transference reveals that the young girl is intimidated by the context of this new, clinical environment. I understand that she is "telling me" indirectly that she has yet to complete the separation process from her mother. In my own countertransference, I accept treating her like a child and receive her with her mother at my clinic until she feels more secure. Typical of patients who find that words fail them, S. uses her body language and attitude to express what she feels.

The real onset of therapy commences at the end of the third session, when I am able to convince S. that I genuinely recognize her deep suffering. I promise her that I can help, and she is comforted when I tell her that she can stop the discussions, or refuse to answer any of my questions, at any time. By the fourth session, she accepts to attend a session with only me in the room.

To further reduce her resistance and to help lessen her antagonism, I establish a positive rapport with her by telling her that I understand that she wants to regain power over her own body and to be in control over what she is experiencing. Gradually, she begins to relax as she becomes convinced that I empathize with her internal journey. She feels that I accept her understanding and "rationalization" of matters. I coax her gently but persistently to talk about her feelings. Eventually, she begins to express that she feels misunderstood. She justifies taking distance from her friends because she "prefers to be alone." I understand that taking distance is the only tool she has to avoid dealing with feelings that she finds difficult to express and issues she finds difficulty in facing. After this breakthrough session, S. is more trusting of her therapist and the therapeutic relationship becomes more fluid.

The therapy S. requires is typical of an adolescent whose body has been suddenly and abruptly transformed by puberty. She perceives the physiological changes impacting her body as being an aggression imposed on her from the outside. She feels violated by this attack on familiar parts of her inner and outer being without her permission. She has lost parts of herself that she had come to know and had learned to master as she grew up. The physical experience wrought upon S. by puberty is so sudden that the transformations in her size and weight feel frightening and dangerous. Her fears and confusion are particularly aggravated as she cannot find the words to articulate her new affect.

Thus, the therapy to remedy S.'s response to the pubescent trauma she is experiencing consists of addressing her fears and confusions and restoring trust in herself by discussing some of the disturbing physiological changes to her body caused by her experience of puberty and talking about the emotional turmoil that she is suffering as a consequence of these changes. When we talk about her experience with puberty, S. mentions that she felt her brothers did not change so much, or were not as impacted in their sensory world and body experience as she. I explain to her that everyone's experience with puberty is unique, but that trauma in itself is a similar experience for all of us. I explain to her that everyone experiences different traumas at different points in our lives; and, we all must deal with these traumas at some point in our lives.

AWARENESS-RAISING AND PUBERTY

The Sudden Rupture of a Safe Haven

Educating adolescents about puberty can prevent turmoil if information is provided in the right way, in the right dosages, and at the right time. However, too much information about puberty at the wrong time can add to the trauma an adolescent is already experiencing.

For example, S. recalls that she felt "abnormal" after reading a pamphlet about adolescence, because she did not recognize or feel the sexual needs the pamphlet described as "normal." Subsequently, S. stigmatized herself as being "asexual"[2].

Discussions with S. and other young people lost in their sexual identity reveal that they desperately want to stop the initiation into adulthood and the processes leading to their sexualization. Pubescent anxiety is intensified by the psychosocial upheaval caused by changes in status and role and the gender and other identity issues that arise from the body being attacked by what adolescents feel is "the unknown." Furthermore, adolescents feel their bodies no longer serves as a point of reference because of the disruptions caused by puberty, such as metamorphoses in secondary sexual characteristics and transformations in size and weight. These sudden ruptures in the safe haven represented by the once childhood body and its references are yet another dimension of the pubescent experience that are symptomatic of trauma.

On Being "Alone With Nonsense"

The feeling of being alone in having to deal with all "this nonsense" is also symptomatic of trauma. S. does not want me to link her experience with puberty to that of others. "That's nonsense," she replies when I tell her that everyone experiences this turmoil. She repeats this phrase, "It's all nonsense" in order to avoid any explanation she does not want to hear.

The unpredictability and sudden sexual arousal experienced during puberty are so disturbing for S. that she wants to just skip the entire initiation into adulthood and sexualization process and every reference to it. Any discussion about seduction, desire, attraction, lust, or sexual inclination are avoided and lead to reactions of disgust. In fact, S. represses anything that may evoke the disturbances she currently feels from bodily contact. From a libidinal point of view, there is a high risk of being overwhelmed when encountering this strange, anxiety-provoking, and seemingly imposed experience. I help her recognize these fears about her emerging sexuality so that she

[2]Some adolescents quickly proclaim they are "homosexual" because they "love" a same sex friend and are not interested in mingling with the other sex, although it may just be that the adolescent's sexual desires and inclinations have not yet fully developed.

does not feel so overwhelmed and react to the subject with such instant and intense avoidance.

In fact, not only is referring to experiences or issues as "nonsense" typical of trauma, but so is the manner in which S. feels a sense of helplessness—at least with her own limitations—despite the developed intellectual capacities she has gained through adolescence. S finds herself in solitude and alone in her struggle. These expressions confirm our hypothesis that S.'s "fundamental assumptions that the world is benevolent and meaningful" have been shattered (8), and that her experience is as traumatic as any other patient suffering from PTSD or ASD.

Through our sessions, I work incrementally with S. to reduce this recalcitrance. As soon as S. begins to actively express what she wants, the therapy becomes more effective.

She wants "to find herself" and implores that "this is not me." She wants to regain her old belief of invulnerability and predictability. She says, "I want to go back to the time when I had a grip. I was a perfect girl. I could rule my world." She does not want to feel passive. She yearns to regain the safe, secure relationship to herself she once had, and she seeks to preserve her childhood illusion of omnipotence. She also has no tolerance for bereaving the loss of her infantile power.

But, the growing process—puberty—has decided differently for her.

Nowhere to Turn

The third characteristic of the traumatic experience is the inability to turn to others for help. Among her symptoms, S. does not respond to her parents' questions. She often responds to "how are things?" with "nothing" or "everything is fine." This dysfunctional communication is not only frustrating and confusing for S.'s parents but it leaves S. feeling even more alone.

S. senses that she has lost her parents as an "auxiliary" of the Self. The instinct to protect herself leads her to try and take possession of the containment and protection functions that her parents once provided. To achieve this autonomy, this newly "sexualized" teenager finds herself bound to separate psychologically from her parents. However, this disengagement also imparts a feeling of danger.

Nevertheless, the process has begun. As another consequence of puberty, she has become individualized and has embarked on a "work of disengagement" (9) that transforms the relational bonds that once provided her with security. Now, the Oedipal conflict is enacted as the body becomes capable of fulfilling Oedipal desires. Because of "incestuous potentiality" (10), S. starts looking for ways of being—without her parents—to prove her independence to herself. This rupture in the original containing envelope makes an adolescent more vulnerable and sensitive to intrusion. Unfortunately, it can also render family support ineffective.

Thus, S. feels she has to physically distance herself from her parents. This separation invites in a new relational style between an adolescent and his/her parents, and can risk family integration. An adolescent also may vacillate with hostility between his/her need to be independent and the need for help from his/her parents because of the unbearable sexualization of the relationship and the taboo associated with this experience.

Therapeutic Outcomes: Social Withdrawal and Reintegration

By the seventh session, S. has begun to accept that other adolescents are experiencing similar pubescent challenges and processes. Subsequently, S. tries to re-establish a relationship with her group of friends. However, at the following therapy session, she reports that she does not like what she sees and hears among her friends. "They only talk about silly things like fashion or gossip about other girls." She feels she has lost her friends and says, "I don't understand them. Why are they this way?"

This question is a transformative moment in S.'s therapy as she finally tries to use me as a source of identificatory and narcissistic support to appease her traumatic and sensed solitary experience. From this pivotal session forward, she becomes more open and flexible, and begins to show trust in herself and in her own judgments.

The development of S.'s interpersonal reasoning leads to a greater understanding about the feelings of others. This empathy is then translated and utilized to understand her own emotions. She begins to see how her relationship with others is impacted by motive and behavior. S. becomes more open to accepting my guidance in examining how her over-investment in Self and in image have become a way of protecting her vulnerability and the fragility of her "being." Subsequently, she begins to make the connection that her friends feel and do the same—resorting to humor or other forms of rationalization as defense mechanisms to protect themselves and to try to control how they feel.

This evolution of S.'s understanding and interpersonal reasoning not only helps alleviate her own inner turmoil and psychodynamic upheaval, but she also begins to impact her group of friends positively. In turn, the group responds positively to her need for community and become her source of support and solidarity—so much so that she no longer seeks this security from her family (11). S. has progressed so much that she even attempts to assist a friend who has been inflicting harm upon himself. She and her friends intervene on their friend's behalf and make sure that the school psychologist is made aware of his self-harming behavior. In effect, S. and her friends become his narcissistic support facilitators.

In one of our sessions, S. shares that she understands the strange contradiction in his intention "to hurt himself in order not to suffer anymore." She explains that she feels this paradox echoes in her because she felt the same way not so long ago. This recognition assures me that S. is finally ready to conclude her therapy and move on.

CONCLUSION

During the transition from puberty into adolescence and onto adulthood, young adolescents will feel an "internal loss of a part of the Self" (12). They will experience deep-set anxiety

and upheaval about puberty, sexual identity, gender roles, and career choices. If an adolescent's environment, parents, and peers are incapable of providing a protective container for the traumatic upheavals wrought upon the adolescent by puberty, the development and the mechanisms for healthy growth can become inaccessible.

It is worthy to note that not all adolescents experience a deeply traumatic puberty. Some are able to see their peers or siblings as mirrors or use them for support. However, when overwhelmed by a more traumatic pubescence, adolescents will act out in an attempt to regain self-control over disturbing and disruptive exogenous and endogenous physiological and psychological experiences. Mutism, social withdrawal, and self-harm are only some of the behaviors that adolescents may adopt to resolve the loss of control and feeling of helplessness and aloneness they encounter when suffering the traumas of puberty. Feelings of confusion, anxiety, mood swings, low self-confidence, and depression are typical of this age group.

These symptoms can render puberty traumatic, making affected adolescents even more vulnerable to stressors (13, 14). In such cases, psychodynamic intervention and cognitive processing therapy allow adolescent patients to overcome the trauma of puberty by mitigating its negative consequences and exploring new, positive ways of perceiving their bodily transformations. Such interventions and therapy can be critical as adolescence is a period of intervention and an opportunity for the mind to plan for the future (14).

It is also abundantly clear that there are considerable inter-individual variations in subjective responses to these objective pubertal facts, depending on one's perception of what is or is not traumatic. However, despite the fact that the puberty as a trauma may not be systematically confirmed in all adolescents, it should be an assumption adequately considered when working in the field of adolescent mental health. Considering the symptoms and emotions associated with puberty as a reaction to the trauma of puberty may help clinicians focus more effectively on that experience and its outcomes as it pertains to both mental and physiological health.

Furthermore, clinicians should remain mindful that the depth and richness of adolescents' creativity can enable them to transform their traumatic symptoms in a manner that will maintain the negative illusion that they can run away from this invasion on their inner world, rather than confront it. Some adolescents need to be helped by their clinicians to distinguish and choose between "fight" and "flight" when coping with their traumatic pubescent experiences. They will need their clinicians to help them incrementally and progressively employ more positive and resilient coping mechanisms that will "allow them to bounce back and move onto the work of building the rest of their lives, with the memory of the trauma." (15) Indeed, adolescents' feelings of self-esteem and self-worth are augmented when they realize that they have overcome this frightening, traumatic challenge to their inner world.

DATA AVAILABILITY STATEMENT

All datasets generated for this study are included in the article/supplementary material.

ETHICS STATEMENT

The ethical approval no USJ-2019-172 (Saint Joseph University of Beirut) was obtained for this study. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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