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Mental-health-related stigma and discrimination: Prevention, role, and management strategies

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Mental-health-related stigma and discrimination: Prevention, role, and management strategies

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Table of contents

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Editorial: Mental-health-related stigma and discrimination: Prevention, role, and management strategies

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Editorial on the Research Topic
Mental-health-related stigma and discrimination: Prevention, role, and management strategies

Stigmatizing attitudes toward patients suffering from mental illnesses and their caregivers, psychotropic medications, mental health institutions and stakeholders, remain a common public health concern, with major repercussions across countries and cultures worldwide (1). Indeed, a negative attitude toward mental health can lead to avoiding approaching mental health providers, delaying timely diagnosis, poor treatment adherence, and worst disease prognosis and patients' quality of life (2). This phenomenon is particularly evident, but not limited, to patients suffering from mental disorders and has amplified following the COVID-19 pandemic (3–6).

In the Research Topic entitled "*Mental-Health-Related Stigma and Discrimination: Prevention, Role, and Management Strategies,*" we collected 15 articles discussing several aspects of mental-health-related stigma and discrimination from different perspectives and countries, with a particular focus on strategies tackling them. Our editorial aims to summarize their key-points and invite the audience to read this collection.

Several articles highlight the role of psychiatric stigma amongst medical students from various perspectives and how this negative attitude could impact patients with mental illness, particularly those affected by challenging diseases such as schizophrenia spectrum disorders. Movahedi et al. assessed the attitudes of Iranian specialty trainees, who are frontliners dealing with this group of patients, toward providing psychiatric services to patients and their families. They conclude that internal medicine and cardiology residents have more stigmatizing attitudes while psychiatric residents show a more positive behavior toward their patients. In another study conducted in Iran, Zare-Bidaki et al. evaluated the effect of virtual reality on stigma, empathy, and knowledge of medical students toward patients with psychotic disorders. They concluded that this novel tool can be a potential effective instrument in decreasing stigma and increasing empathy and knowledge among medical students (Zare-Bidaki et al.). Moreover, Rezvanifar et al. introduced an educational package for improving the attitude of medical students toward patients with mental disorders based on a scoping review and an expert consensus conducted through a Delphi panel. The developed package contained four interactive interventions: (1)

showing a movie and discussing it, (2) implementing psychiatric training including contact with patients living with psychiatric disorders, (3) adopting social communication with patients with psychiatric disorders, and (4) setting up a group discussion on defining stigma and personal experiences (Rezvanifar et al.). Moreover, Mohebbi et al. performed a systematic review to determine Eastern Mediterranean (EMR) medical students' attitudes toward psychiatry, concluding that EMR medical students generally have positive attitudes and predispositions toward the field. On the other hand, Porfyri et al. studied stigma among Greek healthcare professionals and reported that, despite the high level of familiarity, the employees displayed a rather poor willingness to interact with patients with mental illness, and endorsed significant prejudice toward them.

Another group of articles investigated mental-health-related stigma among some influential groups in societies, and which interventions may improve their attitudes toward patients. Taghva et al. performed a two-day training workshop to improve the attitude of clergymen toward patients with mental disorders. Findings showed that the awareness and attitude of ecclesiastics toward mental health and its consequential stigma were relatively good, and significantly improved upon holding the workshop (Taghva et al.). In addition, Eissazade et al. investigated the attitude of a group of Iranian theater artists toward patients with mental disorders, as well as their own mental health. Participants' strongest fears were to allow an individual with a severe mental disorder to take care of their children and the possibility of patients in this group to obtain a hunting license. Twenty-five percent of participants were at risk of moderate to severe anxiety, and 17.3% participants were at risk of moderate to severe depression (Eissazade et al.).

Several other articles investigated stigma among general populations, as well as some strategies to fight this issue. Ruiz et al. reported findings of a survey on stigma among university students in Valencia, Spain. They found that women show fewer stigmatizing attitudes than men but similar stereotypes and prejudice toward people with mental disorders. The survey as also found students of medicine, psychology, and teaching to have fewer stigmatizing attitudes than students of economics and data science, but differences between degrees were more subtle in terms of stereotypes and prejudice toward people with mental disorders (Ruiz et al.). In an opinion piece, Saboury Yazdy et al. shared their experience using a smartphone application called "Be my Voice" to break social stigma against domestic violence in Iran. Sawaguchi et al. reported their findings on COVID-19-related stigma and its relationship with mental wellbeing using a cross-sectional analysis of a cohort study in Japan. They concluded that people aged $\geq$ 70 years are more likely to exhibit COVID-19-related stigma. Additionally, the results indicate that COVID-19-related stigma negatively impacts quality of life secondary to the underlying psychological distress (Sawaguchi et al.).

Two other articles focused on the relationship between stigma and suicide as a major public mental health problem. In a perspective piece, Shoib et al. raised concerns on the relationship between suicide, stigma, and COVID-19 in low- and middle-income countries. The article particularly addresses the potential link between social stigma and suicide in the wake of the current coronavirus pandemic and proposes some practical ideas for reducing mental-health-related stigma (Shoib et al.). Masoomi et al. in another perspective piece, also raised the issue of stigma as a barrier to suicide prevention strategies in Iran.

Two other publications evaluated psychometric properties of stigma-related questionnaires. Dinmohammadi et al. evaluated psychometric properties of the Self-Stigma Inventory for Iranian families of persons who use drugs, and concluded that it is a valid and reliable scale with three factors and 14 items. Additionally, Burzee et al. re-evaluated Stuart's Police Officer Stigma Scale and their findings imply that this scale is reliable but needs to include two components rather than one.

Last but not the least, de Filippis et al. performed a clinical study on internalized-stigma and dissociative experiences in a sample of patients affected by bipolar disorder in a clinical outpatient setting in Catanzaro, Italy. Their findings suggest that self-stigma is associated with dissociative symptoms, reducing overall quality of life. Thus, authors recommended the early identification of at-risk patients with previous lifetime abuse and high perceived stigma, which could lead the way for an ever more precise tailoring of treatment management in bipolar disorder (de Filippis et al.).

All in all, the articles collected in this Research Topic reemphasize the importance of mental-health-related stigma as a major public health issue. Due to ongoing substantial research in this field, "*Community Series in Mental-Health-Related Stigma and Discrimination: Prevention, Role, and Management Strategies – Volume II*" has been launched for further submissions and we are looking forward to continue exploring this topic.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

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

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Developing an Educational Package to Improve Attitude of Medical Students Toward People With Mental Illness: A Delphi Expert Panel, Based on a Scoping Review

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Introduction: The importance of stigma toward patients with mental illness in medical students as future physicians cannot be overemphasized. There is currently no formal training to reduce stigma toward mental illness in medical students in their educational curriculums in Iran like most other low and middle income countries. Therefore, aiming to provide a practical and effective training package focused on reducing stigma toward patients with mental illness in medical students, the current study conducted, as an expert panel with Delphi method, based on a scoping review, to develop an education package to improve attitude of medical students toward patients with mental illness.

Materials and Methods: We surveyed the available international databases including PubMed, Google Scholar, Scopus, PsycINFO, Tripdatabase, Web of Science, Cochrane Database of Systematic Reviews as well as Persian databases including Iranmedex, SID, Irandoc and Magiran in February and March 2020. After an extensive review of related resources, 13 articles met our inclusion criteria. Then, we extracted the related data including type and duration of the interventions, sample size, mean and standard deviation of stigma scores before and after interventions. To develop the package among the included interventions, we asked 16 experts in psychology, psychiatry, and social medicine to rate the interventions based on a number of variables such as effectiveness, feasibility and applicability in a Delphi process.

Results: The selected intervention in Delphi method with consensus of experts included a set of four sequential interactive interventions: showing a movie and discussing it, psychiatric training including contact with people who affected psychiatric disorders, social communication with people who affected psychiatric disorders, and group discussion on defining stigma and personal experiences.

Conclusion: In the present study, we recommend a set of interventions to reduce stigma toward patients with mental illness among medical students in the form of a package of combined, interactive and sequential interventions that have been previously been shown

to be effective in reducing stigma related to mental illness. We expect that implementation of these interventions would reduce mental illness stigma in medical students; which needs further verification.

Keywords: social stigma, community psychiatry, mental illness, medical students, medical education

INTRODUCTION

Stigma is a negative form of labeling individuals or a group of individuals that distinguishes them from the other members of the society, based on physical or psychological differences or perceived differences (1–3). The word stigma has Greek roots, referring to a marking that was seared on the foreheads of the slaves in the past to distinguish them from others and prevent them from escaping (1, 4). In Sanskrit language, too, the Aryan word, stigma, means to mark (5). The stigma of mental illness leads to discrimination, loss of social status, confrontational behaviors, and reduced quality of life for those labeled mentally ill. For the stigmatized individual, this can aggravate the illness, result in substance abuse, prevent them from taking medications and not following up with treatment, and ultimately create serious issues for their families (6). On the other hand, from the public's point of view, admitted people with psychiatric disorders are perceived be different from other hospitalized people. This different position causes emotional distress in people with psychiatric disorders. This difference of attitude toward psychiatric disorder is because a patient hospitalized in the psychiatric ward, especially a person with schizophrenia, is perceived by others as dangerous, incompetent and unreliable (7–9).

Stigmatized attitude toward patients with mental illness is also a major problematic concern among healthcare workers including medical students. One of the main negative attitudes toward mental illness by physicians with different specialties is that they consider the psychotropic medications as dangerous, ineffective, and with many side effects that endanger their patients' independence, while physicians play a key role in introducing psychiatry to people and changing their attitudes (10).

In addition to the prominent and well-established role of mental health therapists in treating mental disorders, their actions are also crucial in reducing stigma. Among the actions of psychologists and psychiatrists in de-stigmatizing psychiatric people is improving the quality of psychiatric services. Providing comprehensive and team therapies is one of these strategies. For example, holding classes and workshops for the public and other health care providers or their presence in the media can reduce stigma (11). Timely provision of good mental health care services and effective treatment of mental illnesses can prevent the deterioration of patients and result in their better integration in society. This could have an important role in de-stigmatization of mental health conditions. In this regard, certain groups, including physicians, need to be trained (11). Unfortunately, lack of educational programs for physicians on psychiatric disorders and the negative attitude toward mental health conditions is prevalent among physicians and paramedics, which results in stigmatization of people with mental illness (12). Also, there are limited studies in Iran which have examined the stigma of mental illness among medical students. Tavakoli et al.'s (13) study on medical students demonstrated that cognitive and emotional components impact the formation of mental illness stigma, negatively impacting students' assessment of people with mental health conditions as risky and uncontrollable (13). In another study, the stigma of depression among medical, technical, and art students, and their attitudes toward seeking help were examined. It showed that the most common way students became familiar with mental health conditions was by watching videos and films related to mental illness (14). Amini et al. (15) examined medical students' views on psychiatry and its selection as their future field. In this study, about half of those who expressed interest in psychiatry had relatives or close friends with a psychiatric disorder (15). In another study, the effect of increasing medical students' exposure to people with mental illness was examined, which showed that the increased exposure did not improve students' negative attitudes toward mental illness and psychiatric conditions (16).

Most studies emphasize the importance of psychiatric education to reduce stigma, especially among medical students. However, the findings from previous studies are scattered and have not yet been presented in a coherent program or package to reduce stigma. For this reason, insufficient information is available on the implementation of interventions and their impact over a long period of time. Since there are no established educational program to reduce stigma through medical educational system in Iran, we aimed to provide a practical and effective training package to reduce stigma of people with mental illness in medical students using an expert panel with Delphi method, based on a scoping review.

MATERIALS AND METHODS

Step 1: Search Strategy, Data Extraction and Quality Assessment

We searched the available international databases including PubMed, Google Scholar, Scopus, PsycINFO, Tripdatabase, Web of Science, Cochrane Database of Systematic Reviews as well as Persian databases including Iranmedex, SID, Irandoc, and Magiran. We did not limit our searches to a specific time period. The languages of the searched sources were English and Persian. Persian equivalent terms for stigma, attitude, mental illness, intervention, and program were used separately and combined in the Iranian bibliographic database. In the International Bibliographic Database, the keywords of stigma and related words, mental illness and related words such as intervention, reduction, improvement, or similar words were

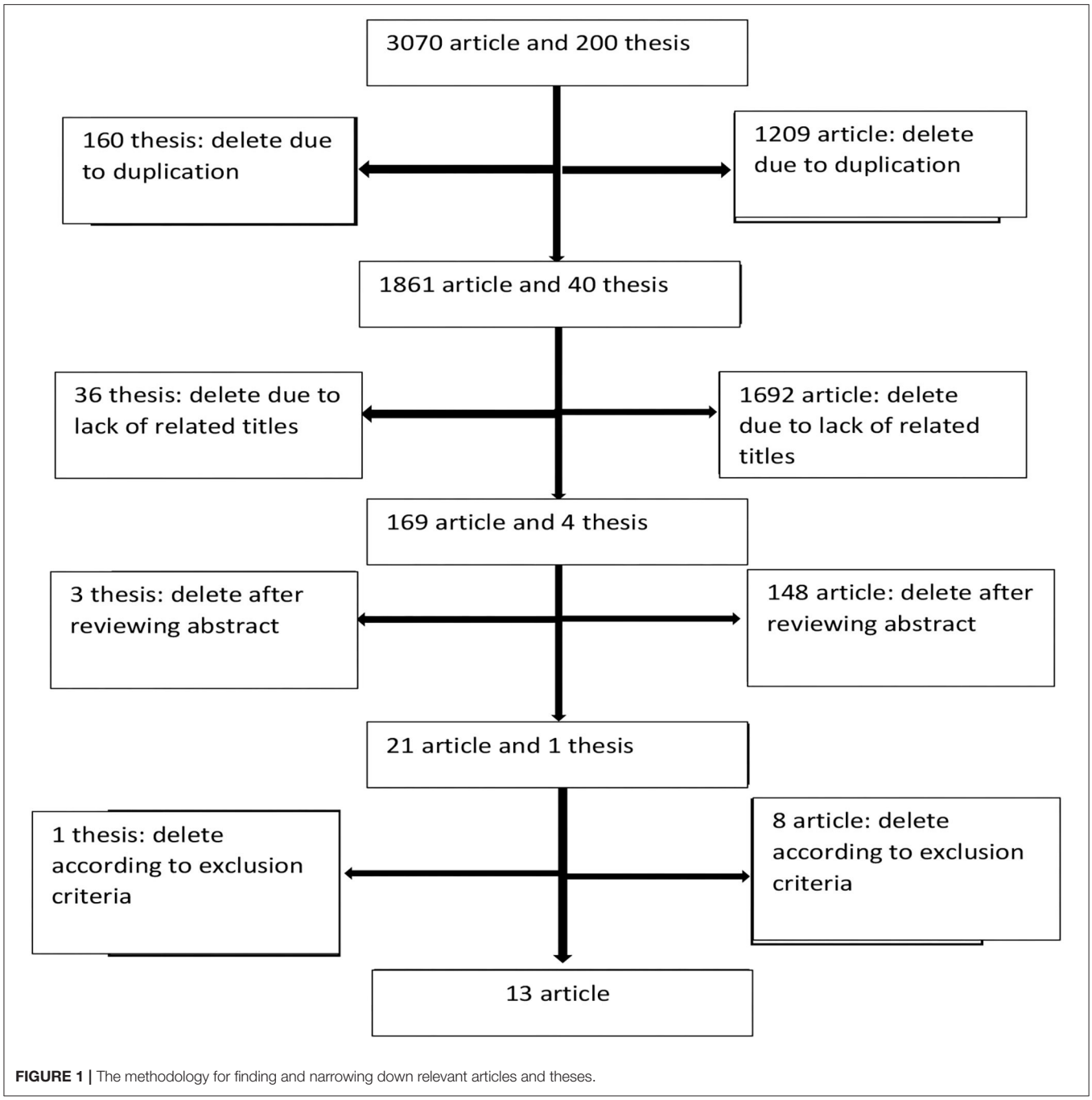

FIGURE 1 | The methodology for finding and narrowing down relevant articles and theses.

used in combination. We combined the results of each search with the AND operator.

We performed the online search in February and March 2020 and retrieved a total of 3,070 articles and 200 theses. Two researchers reviewed each document independently and a third person reviewed the possible disagreements for a final decision. Initially 1,209 articles and 160 theses were excluded due to duplication. In the next stage, by reviewing the titles, 1,692 articles and 36 theses were excluded due to lack of relevance with the study's objectives. Then, we reviewed the abstracts and excluded 148 articles and three theses. Finally, 21 article full texts and one thesis were thoroughly reviewed for inclusion criteria.

Out of a total of 21 articles and one thesis, 13 articles were selected according to our inclusion criteria (**Figure 1**). We included studies that assessed the efficacy of interventions to reduce stigma of mental illness in health system staffs (physicians, nurses, psychologists, social workers and health system students), with a randomized controlled trial method.

We extracted the type of stigma reduction interventions, the sample sizes of the control and intervention groups, the mean

stigma scores in each group before and after the intervention, the standard deviations and the durations of the interventions. Then, the effect size of each intervention was calculated using Cohen's formula. The data obtained from each intervention are provided in **Table 1**. Finally, out of 13 selected articles, 19 stigma reduction interventions were obtained to enter the expert panel using Delphi method.

Step 2: Delphi Expert Panel

The collected data were entered into the Delphi method to select interventions to design an educational package for improving attitudes toward people with mental illnesses amongst Iranian medical students. In this way, sixteen experts, faculty member with a substantial research and practical history on the topic, from different related fields such as psychology, psychiatry and social medicine were invited to participate in the Delphi process. The selection of experts was based on one of the following criteria: 1. Experts with at least 15 years of work in the field. 2. Who have research and practical experience on the stigma toward patients with mental illness topic. 3. These individuals were invited to participate and cooperate in selecting the best educational interventions to reduce stigma. In this way, the data collected from the review of previous studies **(Table 1)** and a list of interventions were sent via email to the participating experts. They were asked to score each intervention, based on submitted evidence, feasibility criteria, degree of necessity, degree of attractiveness for students, and the possible impact on the Likert Scale from one (strongly disagree) to four (Strongly agree. At the end of the list of interventions for scoring, two open-ended questions were asked from experts about the ability to combine interventions and indicate the most appropriate combination of interventions to be included in the educational package. Out of 16 experts, 14 experts sent back their answers. Experts' responses were summarized both quantitatively **(Table 2)** and qualitatively. In the quantitative method, the total scores given in the subscales defined for each intervention (feasibility, degree of necessity, level of attractiveness for students and potential impact) were averaged. In the qualitative method, the opinions for and against each intervention method and the experts' answers to the open questions were collected and organized. In the next step, the authors discussed the quantitative and qualitative responses to select interventions for the development of the educational package. As a result, the interventions with a low score (average score ≤ 3) and interventions that were argued to be less adaptable to Iran's cultural and social conditions were excluded. Finally, out of 19 interventions, six were prioritized. The six selected interventions employed one or more of the following four approaches; direct education, contact with people with mental disorders, video screening, and group discussions.

In the second stage of the Delphi process, the 14 experts who collaborated in the first stage of Delphi, were asked to comment on implementing the six interventions selected for the educational package and explain their reasoning for agreement or disagreement. Out of the 14 experts, 11 experts submitted their answers at this stage. The responses were summarized and the final findings were reviewed and discussed by the authors in this study.

RESULTS

After reviewing the 13 selected articles, the type of stigma reduction interventions, the impact of the interventions, the follow-up period after the interventions, and the durations of the impact of the interventions were extracted from the available articles. Most studies used more than one intervention or combination of several interventions to reduce stigma on the target group. The findings of previous studies are presented in the **Table 1** below.

The findings obtained in this study are discussed below:

Qualitative and Qantitative Summary of Data Obtained From the First Stage of Delphi

This stage is the result of the findings obtained from the first Delphi stage. The consensus among all the participants in the first stage of Delphi was that all of these interventions could be combined, people and if implemented properly, can be effective in reducing stigma among Iranian medical students. One participant stated that this work should not be limited to one course or 1 month of training and should last for 3–5 years during the students' theoretical, internship, and clinical training courses to achieving higher impact and quality. Some participants emphasized implementing approaches that include the three areas of knowledge, cognition, and behavior. One participant believed that stigma is a kind of phobia that can be reduced through repeated exposure. Of the 19 interventions obtained, most participants suggested interventions that include theoretical training and increased interaction and social contact.

Data From the Group Discussion of Authors After the First Stage of Delphi

The researchers of this study discussed the data obtained from the first stage of Delphi. Based on the findings, six stigma reduction interventions were selected for the proposed education package, consisting of holding a workshop, education with contact with people, training in diagnosis and treatment of depression and anxiety and self-confidence for patient management, showing movies about social stigma, direct face-to-face contact with a people with a psychiatric disorder, and the formation of open groups and discussions about stigma.

Data From the Second Stage of Delphi

The experts re-evaluated the six selected stigma reduction interventions in the second stage of Delphi. At this stage, participants explained their agreement or disagreement. In the second Delphi stage, participants commented on each of the interventions, which is given below:

Intervention of Holding a Workshop

Three experts disagreed with its implementation in the stigma reduction educational package. The first participant who opposed this method believed that it is an efficient, practical, attractive, and innovative method, but most professors are unfamiliar with its design and implementation. It is also very time-consuming and costly, and with the financial problems of hospitals and

TABLE 1 | Anti-stigma interventions and their effect in previous studies.

Title of study	Intervention	Follow up and the duration of the intervention	The effect size of the intervention	
			Control group	**Intervention group**
Randomized study of different anti-stigma media Finkelstein et al. (17)	1. Reading articles related to stigma 2. Holding training sessions through the media	1. Immediately after the intervention 2. Six months after the intervention	*N* = 48 CAMI (Authoritarianism) → after intervention: ES[a]: 0 Six months after intervention: ES: 0.25 CAMI (Benevolence)→ After intervention: ES: 0 Six months after intervention: ES: 0.09 CAMI (Social restrictiveness) → After intervention: ES: 0 Six months after intervention: ES: 0.04	Reading group (*n* = 76), Program group (*n* = 69) Reading group: CAMI[b] (Authoritarianism)→ after intervention: ES: 0.65 Six months after intervention: ES: 0.36 CAMI (Benevolence)→ After intervention: ES: 0.37 Six months after intervention: ES: 0.09 CAMI (Social restrictiveness) → after intervention: ES: 0.72 Six months after intervention: ES: 0.16 Program group: CAMI (Authoritarianism)→ after intervention: ES: 1.42 Six months after intervention: ES: 0.84 CAMI (Benevolence)→ after intervention: ES: 0.8 Six months after intervention: ES: 0.41 CAMI (Social restrictiveness) → after intervention: ES: 1.39 Six months after intervention: ES: 0.58
Putting the person back into psychopathology: an intervention to reduce mental illness stigma in the classroom Mann et al. (18)	Holding classes and training based on the humanism of the disease along with presenting the life story of a psychiatric patient	No follow up	Control group: *n* = 26 ES: 0.0	Experimental group: *n* = 27 ES: 2.83
Changing Stigma Through a Consumer-Based Stigma Reduction Program Michaels et al. (19)	Holding training workshops, training with contact with people	No follow up	Control group: *n* = 65 ES: 0.1	Interventional group: *n* = 65 ES: 0.30
Comparing the Effect of Contact-based Education with Acceptance and Commitment Training on Destigmatization Toward Psychiatric Disorders in Nursing Students Vaghee et al. (20)	1. Training along with contact with psychiatric people who have improved 2. ACT	1. After the intervention 2. One month later	Control group: *n* = 36 After intervention: ES: 0.37 One month after intervention: ES: 0.63	Contact-based education: *n* = 37, ACT[c] group: *n* = 38 Contact-Based Education Group: After intervention: ES: 1.08 One month after intervention: ES: 1.85 ACT Group After intervention: ES: 0.89 One month after intervention: ES: 1.28

(Continued)

TABLE 1 | Continued

Title of study	Intervention	Follow up and the duration of the intervention	The effect size of the intervention	
Comparing the effects of live and video-taped Theatrical performance in decreasing Stigmatization of people with serious mental illness Faigin et al. (21)	1. Watching theater with the subject of stigma related to the person with a mental health condition 2. Watching movies	1. After the intervention 2. One month later	Control group: $n = 123$ CAMI (Authoritarianism) → After intervention: ES: 0.15 One month after intervention: ES: 0.20 CAMI (Social Restrictiveness) → After intervention: ES: 0.16 One month after intervention: ES: 0.24 CAMI (Social Restrictiveness) → After intervention: ES: 0.07 One month after intervention: ES: 0.02	Live group (theater): $n = 81$, video group: $n = 99$ Live group (Theater): CAMI (Authoritarianism) → After intervention: ES: 0.31 One month after intervention: ES: 0.14 CAMI (Social Restrictiveness) → After intervention: ES: 0.26 One month after intervention: ES: 0.13 CAMI (Benevolence) → After intervention: ES: 0.3 One month after intervention: ES: 0.09 Video group: CAMI(Authoritarianism) → After intervention: ES: 0.04 one month after intervention: ES: 0.10 CAMI (Social Restrictiveness) → After intervention: ES: 0.02 one month after intervention: ES: 0.17 CAMI (Benevolence): After intervention: ES: 0.1 one month after intervention: ES: 0.07
Filmed v. live social contact interventions to reduce stigma Clement et al. (22)	1. Watch a movie of health care providers talking about their experience with a patient with a psychiatric disorder; Watch a movie of people telling their life story and their experience of stigma 2. Watch a lecture of a patient and therapist about their experience of mental health and stigma	1. After the intervention 2. Four months later	Lecture (control) group ($n = 124$) After intervention: ES: 0.26 Four month after intervention: ES: 0.19	DVD group ($n = 117$), Live group ($n = 119$) DVD group: After intervention: ES: 0.79 Four months after intervention: ES: 0.54 Live group: After intervention: ES: 0.65 Four months after intervention: ES: 0.22
Impact of Skill-Based Approaches in Reducing Stigma in Primary Care Physicians Beaulieu et al. (23)	Proficiency in diagnosing and treating depression and anxiety and self-confidence in patient management	No follow up	Control group ($n = 34$) ES: 0.10	Intervention group ($n = 39$) ES: 0.32
A mental health training program for community health workers in India: impact on recognition of mental disorders, stigmatizing attitudes and confidence Hofmann-Broussard et al. (24)	Holding a workshop (introducing mental health and its disorders with questions and answers, promoting mental health in the community, improving communication, direct contact with people, direct contact with the improved patient and hearing their life story)	No follow up	Control ($n = 22$) Stigma score–psychosis vignette: ES: 0.25 Stigma score–depression vignette: ES:0.48	Intervention ($n = 34$) Stigma score–psychosis vignette: ES: 0.84 Stigma score–depression vignette: ES: 0.58

(Continued)

TABLE 1 | Continued

Title of study	Intervention	Follow up and the duration of the intervention	The effect size of the intervention	
Effects on Knowledge and Attitudes of Using Stages of Change to Train General Practitioners on Management of Depression Shirazi et al. (25)	Holding a workshop (teaching the diagnosis and treatment of people with depression), showing movies and discussing it, forming open groups, presenting and introducing the patient, playing the role of the patient-therapist	No follow up	ES: 1.44 (Size of the intervention effect on physicians' awareness)	ES: 2.09 (Size of the intervention effect on physicians' awareness)
Reducing the Mental Health–Related Stigma of Social Work Students Rubio-Valera et al. (26)	Educating and sensitizing students to psychiatric problems along with holding a workshop by a patient with a psychiatric disorder who has had ten training sessions about empowerment and learning communication skills with a social worker	1. Fifteen days later 2. Three months later	Intervention ($n = 79$) CAMI (Authoritarianism)→ After 15 days: ES: 0.16 After 3 months: ES: 0.30 CAMI (Benevolence)→ After 15 days: ES: 0.33 After 3 months: ES: 0.30 CAMI (SCMHC)→ After 15 days: ES: 0.33 After 3 months: ES: 0.42 Personal stigma: After 15 days: ES: 0.22 After 3 months: ES: 0.40 Perceived stigma: After 15 days: ES: 0.08 After 3 months: ES: 0.12	Intervention ($n = 87$) CAMI (Authoritarianism)→ After 15 days: ES: 0.46 After 3 months: ES: 0.45 CAMI (Benevolence)→ After 15 days: ES: 0.47 After 3 months: ES: 0.26 CAMI (SCMHC)→ After 15 days: ES: 0.63 After 3 months: ES: 0.39 Personal stigma: After 15 days: ES: 0.50 After 3 months: ES: 0.24 Perceived stigma: After 15 days: ES: 0.06 After 3 months: ES: 0.11
Reducing the stigma of mental illness in undergraduate medical education Papish et al. (27)	Contact with a patient with a psychiatric disorder	1. After the intervention 2. The end of the training course 3. Three months later	Control group ($n = 56$) After intervention: ES: 0.12 End of training course: ES: 0.45 After 3 months: ES: 0.45	Intervention group ($n = 55$) After intervention: ES: 0.05 End of training course: ES: 0.61 After 3 months: ES: 0.48
Anti-stigma films and medical students' attitudes toward mental illness and psychiatry Kebry et al. (28)	Showing Anti stigma movies	1. After intervention 2. Eight weeks later	Control group ($n = 23$) After intervention: ES: 0.02 Eight weeks later: ES: 0.22	Intervention group ($n = 23$) After intervention: ES: 0.38 Eight weeks later: ES: 0.08
The effect of an anti-stigma program on stigma components on people with a mental health condition among nursing students Asayesh et al. (29)	Anti-stigma program (training program, teaching communication skills to people, group meeting with emphasis on identifying negative thoughts and beliefs and applying the principles of cognitive therapy, group therapy with stigma-related topics for people in the psychiatric ward with the participation of students as a group member, direct contact with people, increasing students' skills in communicating with people	After the end of the training course	Control group ($n = 23$) ES: 0.02	Intervention group ($n = 20$) ES: 1.76

[1]*Effect Size.*
[2]*Community Attitude Mental Illness Score.*
[3]*Acceptance and commitment therapy.*

TABLE 2 | Quantitative average of data in the first stage of Delphi.

Intervention no.	Intervention type	Feasibility	Necessity	Attractiveness for the student	Possible impact in case of implementing
1	Holding training sessions through the media	3.60	3.49	2.74	2.78
2	Reading articles related to stigma	3.22	2.74	1.92	2.17
3	Holding a training class based on the humanity of psychiatric people	3.20	3.35	2.78	2.92
4	Holding a workshop	3.28	3.28	3	2.92
5	Education with contact with people	3.20	3.63	3.42	2.99
6	Educate and sensitize students about psychiatric problems	3.35	3.35	2.64	2.49
7	Playing the role of patient-therapist	3.01	3.09	3.42	2.84
8	ACI	2.35	2.49	2.67	2.74
9	Being proficient in diagnosing and treating depression and anxiety and self-confidence in patient management	3.42	3.28	3	2.78
10	Showing movies about social stigma	3.56	3.17	3.56	2.92
11	Presenting the life story of a psychiatric patient by students	3.06	2.92	3.07	2.70
12	Direct face-to-face contact with a patient with a psychiatric disorder	3.77	3.49	3.09	2.92
13	Watch a video of health care providers (with the content of presenting their experience with a person with a mental health condition) and watch a video of a patient with a psychiatric disorder (with the content of presenting their experience of stigma and their life story)	3.49	3.21	3.28	2.78
14	Watch live patient and therapist lectures on expressing their experience about mental health and stigma	3.34	3.07	3.13	2.92
15	Identify students' negative thoughts about the mentally ill and reform misconceptions	2.92	3.17	3.17	2.74
16	Formation of open groups and discussion about Stigma	3.42	3.31	3.20	2.99
17	Group therapy with stigma-related topics for people with a psychiatric disorder with the participation of students as active members of the group	2.31	2.88	2.85	3.07
18	Workshop by a patient with a psychiatric disorder trained in empowerment and learning skills.	2.45	2.53	2.85	2.63
19	Theatrical performances with the theme of stigma related to the mental illness	2.49	2.28	2.99	2.63

the education system in Iran, there is no priority for holding a workshop. Another expert explained that only workshops with motivational goals could lead to change, which is not a conventional standard for workshops in Iran. A third person opposed to this method believed that a workshop is practical as a part of the de-stigmatization method and that it is not enough to change attitudes and behavior on its own. Eight experts agreed with the implementation of this intervention in the training package. However, to increase the effectiveness, most of them emphasized two-person active interaction in the workshop, using educational posters in the sessions, and holding the workshop by professional instructors in this field.

The Training Intervention Along With Contact With People

only one of the experts disagreed with this intervention who believed that despite the necessity of this intervention, due to its implementation in the current educational curriculum for students, it will not introduce a change in the existing process in the new educational package. Other experts agreed with this intervention. One of the participants suggested this intervention as the priority in the educational package. Most of the experts believed that this intervention should be implemented in outpatient centers, counseling, rehabilitation, private psychiatric clinics, and centers outside the hospital where most people are Non-emergency, Non-psychotic, and have psychosomatic and Non-chronic illnesses, in order to increase the effectiveness of this intervention for students and minimize the risk for people.

Diagnosing and Treating Depression, Anxiety, and Self-Confidence Training for Patient Management

Two experts disagreed with implementing this intervention in the training package. One of the experts believed that implementing this intervention, despite its usefulness, is not feasible with the current facilities. The other expert stated that despite the usefulness of this method, due to doubts about its effect on stigma removal, it is not applicable. Other experts agreed with using this intervention in the educational package. Although many experts were unsure about the effectiveness of this intervention in reducing stigma, they nonetheless believed that this method could improve students' learning by increasing student's empathy skills with people and help provide a comprehensive understanding of people. One of the experts mentioned the necessity of implementing this intervention and emphasized holding regular student communication sessions with the patient in the presence of an educational supervisor to identify the student's problems and mistakes in managing the patient's diagnosis and treatment and give them relevant training.

Intervention of Showing Movies About Stigma

Two experts believed that showing movies have no lasting effect on reducing stigma and disagreed with its effectiveness. One of the participants had no opinions on this intervention due to the lack of information about stigma reduction movies that are culturally appropriate and relevant in Iran. Other participants agreed with the inclusion of this intervention in the training package as an auxiliary method due to its educational appeal to students and to help them learn better.

The Direct Contact and Face-To-Face Intervention With People Who Affected Psychiatric Disorders

Only one of the experts disagreed with its implementation, who believed that contact with people who affected psychiatric disorders already exists in ongoing courses of students and will not have much effect. Other experts agreed with its implementation in the educational package, and one expert suggested it as the priority of interventions in the educational package. Many experts believed that this intervention would be effective if it were implemented after students' course work is completed and in centers where most of the people are Non-emergency, Non-psychotic, and Non-chronic. Direct contact with people will also lead to a deeper understanding by students of people' circumstances. One expert suggested that people be selected from different social and cultural classes.

Open Group Intervention and Discussion About Stigma

All experts agreed to implement this measure. Some of them suggested it as a necessary component and the most appropriate choice for the educational package. Most participants believed that this method would be very effective if directed well. Suggestions were made to better implement this intervention, including training in group discussion, group participation, group counseling, and problem-solving training. Its implementation should be conducted under the direction of trained educators and facilitators skilled in interactive work. One of the experts suggested that if participation in these group discussions were optional, its impact would increase.

Data From the Group Discussion of Rsearchers After the Second Stage of Delphi

Findings obtained from the second stage of Delphi were again shared among the authors in this study for the final selection of appropriate interventions to develop a stigma reduction package. After examining the ideas of experts, researchers concluded that the training interventions for the proposed educational package should be presented in an interactive and multi-stage combination. The combination of interventions can have a strengthening effect on the effect size and increase the level of involvement of people in education. The authors omitted the workshop intervention from the training package due to the difficulties in the educational system for holding workshops and the disagreements of some experts about it. Since diagnosing and treating depression, anxiety, and self-confidence for patient management is better taught to students by watching a diagnostic and therapeutic interview by a professor or assistant, it is unnecessary to place it as a separate intervention in the stigma reduction educational package. Instead, it should be implemented as an essential educational component and other interventions in the students' education to improve the mental health system and the quality of education. Finally, effective methods for reducing stigma and generalities of the educational package were presented with four interventions including, film screening, education through contact with people with psychiatric disorders, contact with people with psychiatric disorders, and group discussion on stigma definition and personal experiences were designed as an interactive and multi-stage combination as follows:

The First Stage:

Screening movies related to stigma, holding group discussion on defining stigma, and participants' personal experiences.

The appropriate time for implementing the first stage of the educational package is in the first week of the students' training course for a minimum of 2 h.

The Second Stage:

Training by psychiatry faculty members along with contact with people: Visiting people by faculty members in outpatient and Non-emergency inpatient centers in the presence of students and at the same time giving the necessary training about the illness and how to communicate with a patient with a psychiatric disorder.

This stage is performed daily during a 1-month training course for students. In the absence of faculty members, this training will be continued by a psychiatric trainee.

The Third Stage:

Contact with people with psychiatric disorders: During this training course, students can independently obtain clinical and community history from two people with psychiatric disorders who are outpatient or hospitalized in psychosomatic and Non-emergency psychiatric wards. Also, for contact with Non-emergency people with psychiatric disorders, daily centers are recommended. Contact with patients refers to students' active participation in patients' classes at day centers, visiting patients' handicrafts shows, and talking directly with patients to hear their life stories.

The Fourth Stage:

Group discussion on defining stigma and personal experiences: It's preferred to be led by a faculty member as well as a trained medical student as co-facilitator. Atmosphere of the group must be easy and Non-judgmental and almost all time should be divided for sharing experience of every student and intervention of the leaders should be remained at minimum level. Suggested duration of the group discussion is 90–120 min.

DISCUSSION

The issue reviewed in the present study is the importance of implementing interventions whose research evidence has shown their effectiveness and usefulness. In addition, these interventions needed to be adaptable to Iran's specific cultural, social, and economic conditions and implementable in the education system. According to previous studies, film screening is an effective intervention in reducing stigma, but most of the studies emphasized its effect on reducing stigma in a short period, and there was no evidence of its long-term effect (18, 21, 25, 28, 30, 31). The researchers in this study, despite knowing of the short-term effect of a film screening in reducing stigma, recommended it as a means to attract students' attention and increase their motivation to participate in the intervention program. The advantages of this intervention method are educational attractiveness, low cost and participants' reflections on it in discussions and subsequent sessions about that movies, and finally, its feasibility of implementing this measure in the educational system.

Regarding the group discussion intervention, all the experts agreed with this measure in the stigma reduction educational package, and some suggested it as the priority in the educational package. In the study of Shirazi et al. (25), the formation of open groups and group discussions in combination with other interventions created a significant improvement in the knowledge and awareness of physicians. As a result, it was recommended to change the educational method to increase awareness and change physicians' behavior to improve communication skills with people with psychiatric disorders. In the study of Asayesh et al. (29), open group discussions about stigma for people in the psychiatric ward were accompanied by students' participation as active members of the group and, combined with other interventions, reduced stigmatization of people among students. In a review study by Heim et al. (32) on open group discussion intervention, one study demonstrated a positive effect on students' attitudes toward psychiatry but did not change their attitudes toward people with psychiatric disorders. In another study, open group discussion combined with other interventions was effective on students' attitudes toward people with psychiatric disorders. According to previous findings, group discussion in combination with other interventions can positively affect changing attitudes and reduce stigma toward people with psychiatric disorders. The researchers of this study also believed in its effectiveness in combination with other educational interventions to reduce stigma, with content about discussions of stigma issues and personal experiences of stigma. One of the advantages of this method is its feasibility in the departments and colleges, and availability. It will also help students pose questions and increase their awareness.

Previous studies have shown that the combination of education and contact with people has effectively reduced negative attitudes and increased people's awareness but has been less effective in changing people's behavior with these people. It is also short-term and less effective over a long period of time (16, 19, 20, 26, 33, 34). The type of contact with people in these studies was through simultaneous training during patient visits, training in the presence of a patient with a psychiatric disorder who has improved, employment in psychiatric wards, providing a theory course at the time of a psychiatric internship, face-to-face interview with the patient in the presence of the instructor. The researchers of this study placed this intervention in the second stage of the proposed educational package and suggested students' contact with patients in this stage through faculty members' visits with patients in the presence of students along with direct education on mental disorder and the impact of biological and environmental causes on them. Furthermore, diagnosis and treatment skills and self-confidence are taught to manage people, which is necessary to promote mental health and increase the quality of treatment of people with psychiatric disorders. There is evidence of the impact of contact with people with mental disorders in previous studies. Interventions based on social interaction with people were the most effective way to improve attitudes and increase interest in communicating with people with psychiatric disorders (20, 31, 34, 35). According to a review by Thornicroft et al. (36), social interaction-based interventions usually improve attitudes in the short term. In a review study by Heim et al. (32), communicating with people directly or visually was associated with improved students' attitudes toward people. In a review study by Mehta et al. (37), in a short period of time, communicating with psychiatric people was more effective in reducing stigma than other intervention methods. More contact with people with severe, chronic, and refractory disorder may have the opposite effect. In the study of Amini et al. (16), contact with people with psychiatric disorders

did not affect students' negative attitudes, contrary to the data from Western studies, which may be due to students' contact with people with severe mental disorders in psychiatric wards.

The researchers of this study recommended face-to-face contact with people with psychiatric disorders in the third stage of the educational package after the combined training and contact intervention (in the second stage of the educational package). Contact with people at this stage was suggested by attending day centers, Non-emergency wards, or outpatient centers.

Limitations

1. One of the limitations of this research was that in searching databases and reviewing journals manually, there might be articles under publication but have not yet been registered in the database or hidden from the researcher and entered into the study.
2. Due to the limited workforce and the financial crisis of the Iranian educational system, it was not possible to include some effective interventions in studies abroad, including a workshop and holding a conference to reduce stigma.
3. In many follow-up studies, the effect of the intervention over a long period of time has not been reported.
4. The effect of interventions in most studies has been measured in combination with other interventions, and there is not enough information about the effect of each intervention separately.
5. Lack of cooperation of some experts in the second stage of Delphi.

Research and Practical Recommendations

1. To determine the appropriate content for the implementation of this educational package, including selecting the appropriate videos available to reduce stigma by experts; preparing appropriate videos to reduce stigma; including providing a video of a professor's psychiatric interview with a patient with his her informed consent; preparing a video about a personal experience of being stigmatized by a person who is recovering from a psychiatric disorder story with his/her informed consent; inviting a celebrity figure in the field of science or art who suffers from a psychiatric illness to present a lecture on their experience and its management; provide opportunities for students to visit the activities of people with psychiatric.
2. Implementing some stigma reduction interventions, not limited to the medical students' psychiatric training course.
3. Evaluation of the effectiveness of this package in the target group.
4. Designing suitable packages for students and people working in other medical professions such as occupational therapy and nursing.
5. Coordinated efforts to fund research and support investment in stigma reduction interventions.

CONCLUSIONS

Because among Iranian mental health professionals and planners, there is no coherent and targeted program to reduce stigma and subsequently eliminate the burden of the illness, in the present study, we present interventional methods to reduce stigma in the form of four intervention methods, as a combination, interactive which include: 1. Film screening, group discussion on it, 2. Education with contact with people with psychiatric disorders, 3. Contact with people with psychiatric disorders, 4. Group discussion on defining stigma and personal experiences.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

This article has been extracted from the approved plan with ethics code IR.IUMS.REC.1397.997 on 28/10/2018 by Institute Review Board of Iran University of Medical Sciences. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

SS, MS, RS, and MR: conceptualization and design. FR, MS, and MR: data collection and initial draft preparation. All authors editing and review. All authors contributed to the article and approved the submitted version.

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Clergy's Viewpoint Change Toward Mental Health and Stigma on Mental Illness: A Short Course Training

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Background: As stigma is one of the main barriers in promoting the mental health, the present study was designed with the purpose of reviewing clergy's viewpoint regarding the effect of mental health workshops on these barriers.

Methods: For this study, by order of Iran's Health Ministry, a questionnaire was designed to examine the clergy's viewpoint related to mental illnesses and the consequent stigma. Ten faculty members and psychiatrists confirmed the questionnaire's validity after some modifications. In this research, 30 members of the clergy from the main religious city in Iran's "Qom" Seminary attended the training workshops for 2 days. The data obtained from the clergy's responses were analyzed using the SPSS software (ver.16) and descriptive and analytical tests. Also, the significance level was considered $p < 0.05$ in all tests. The results exhibited that the mean and standard deviation (Mean ± SD) of the clergy's attitude domain and awareness before the workshop was 1.90 ± 26.30 and 8.31 ± 1.64, respectively. Also, average and standard deviation (Mean ± SD) of their attitude domain and awareness after the workshop was 1.95 ± 29.73 and 1.18 ± 10.70, respectively.

Discussion: The present study, which was designed to examine the clergy's viewpoint toward mental illnesses and the consequent stigma in the most considerable religious base in the country, illustrated that one strategy for reducing mental illness stigma in religious communities can be by holding training sessions to promote the clergy's awareness of and attitude toward mental health.

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Conclusion: There was a significant statistical difference between their awareness and attitude scores before and after the workshop ($p < 0.01$). In the present research, the awareness and attitude of clergy toward mental health and stigma due to mental illness was relatively good and significantly increased by holding the workshop.

Keywords: clergy, stigma, attitude, mental health, mental illness

INTRODUCTION

Attitude includes a set of beliefs, emotions, and behavioral intentions toward an object, person, or event. In other words, it is a relatively stable tendency toward a person, an object or an event that appears in feelings and behaviors (1). Unlike many studies conducted on the awareness and attitude of different groups of people toward the mental illness stigma in the western countries, few studies have been carried out in these areas of non-western countries (2, 3).

Stigma is specified as a negative stereotypical view associated with dogmatic beliefs and discrimination, which causes job, livelihood, and communication losses for the patients and those around them (4, 5). Stigma keeps the patients from social position and human reverence. These negative attitudes can be located in many countries (6–9). For example, in Nigeria, people have many mis-conceptions about mental patients; they are considered dangerous, unpredictable, rebellious, and unhelpful people. Other studies also underline these findings (1).

Unfortunately, mental patients receive this stigma from different sources, such as the community, family members, traditional and religious believers, and even mental health caregivers (10, 11). Negative opinions about mental illnesses can be observed throughout a community; and it seems that they come from culture and are fortified and continued by folklore and the media (12, 13). Prejudices related to mental health and those suffering from mental illness often are associated with unrealistic expectations. These unrealistic expectations provide conditions for the patients so that they internalize the stigma and, in turn, becomesa factor to stigmatize themselves; this state is known as self-stigmatization (14).

Previous studies have shown all aspects of psychiatry in Iran are affected by stigma; and in our society most mental health patients and their families suffer from stigma. Stigma in our society is a factor that prevents people with mental disorders from seeking treatment (2). Because of the culture of perfectionism in Iran that leads to stigma, there is secrecy in revealing statistics. The tendency of some authorities to hide mental illness and hide statistics is the result of cultural characteristics. In the current study, many participants mentioned cultural weaknesses as obstacles to reducing stigma. Moreover, media as a cultural representation of society does not have sufficient knowledge about mental health, which creates a negative image of mental health. Another qualitative study in Iran showed that about one third of families tried to hide their disorder from others (15, 16).

Different studies have illustrated that clergy are traditionally a haven for some people against the mental sufferings (17, 18). A study on Muslim Americans highlighted the role and importance of clergy in this regard (18). It is shown in another study that providing social services for depression treatment would be more effective and successful in the presence of church clergy (19). For drug-dependent in America, church is one of the most important sources of visiting and asking help from families and patients (20).

Numerous studies in the military have affirmed the role and influence of clergy in reducing mental illness stigma, reducing the sense of shame and guilt, and encouraging patients to meet with mental health practitioners (21–23). However, several studies have reported some problems, including clergy's lack of awareness of professional referral centers (18), linking non-related illness factors such as weakness in personality or undesirable topics for illness or the aggravation of mental illness stigma. Despite the negative attitudes in some clergy, who sometimes do not tend to refer the patients (23), recent studies have highlighted the role and importance of the presence of clergy in improving mental health in patients at different levels of prevention and treatment (24).

Moreover, many clergies are interested to take part in the promotion of mental health. In a study in which 65 clergy participated, 81% of them claimed that they required more training on depression and were willing to get more information from referral centers. The results indicated that the presence of clergy has a remarkable role in the reduction of mental illness stigma. In addition, their presence leads to early visits of patients (25), so holding joint seminars with psychiatrists, clergy, and church monks have been planned. Creating a fund to support for mental patients and helping to create housing for schizophrenic patients were among the advances of this initiation in Poland (26).

In an extensive qualitative study performed in Iran, lack of awareness has been proposed as one of the most important barriers to mental health promotion from beneficiaries (27). Numeral solutions have been suggested to tackle this problem named as increasing the awareness of influential groups on society such doctors and clergy (2).

From the perspective of Islam and teachings of the Prophet Mohammad, mental illnesses are divine providence and are separated from sin (18, 27) or divine torment, so this view about mental patients should be divulged among people by spiritual leaders and clergy as this is very effective in decreasing the stigma of mental illnesses in the society. Therefore, the present study was designed with the purpose of reviewing the clergy's viewpoint toward mental health and the stigma due to mental illnesses and also the effect of organizing workshops on changing their awareness and attitude in this area.

METHODS

After reviewing the related literature, examining the texts, and holding meetings with the experts, a questionnaire was designed to examine the clergy's viewpoints related to mental illnesses and the consequent stigma. To check the validity of the questionnaire, 10 faculty members and psychiatrists were selected; and they confirmed the questionnaire's validity after some modifications. Also, Cronbach's alpha calculation was used to define the reliability of the questionnaire and the total alpha coefficient for the questionnaire was calculated as 0.88.

At the beginning of the 1st day, the questionnaires were distributed among the clergy and the intended workshops were held after completing these questionnaires. At the end of the 2nd day, the questionnaires were returned back to the clergy to fill out them again.

The questionnaire included 15 questions, 11 related to awareness, and 4 to the attitude of clergy toward mental illness stigma, which were scored with the 5-point Likert scale. In the awareness domain, the minimum gained score was 0 and the maximum score was 33. Also, in attitude domain, the first gained score was 0 and the latter was 12. If higher scores were achieved, the awareness and attitudes of clergy would improve.

The workshop trainers were three faculty member psychiatrists and one psychologist, each having an experience of 15–25 years of mental health training on their resume, with two of professors collaborating with the Ministry of Health.

Regarding the workshops' training program, three other psychiatric professors, who were identified through the Qom Seminary Service Center, were also consulted. This led to minor changes to the workshop during the two consecutive sessions of the final program and after collaboration with the professors.

The data collected from the clergy's responses were analyzed using the SPSS software (ver.16), descriptive and analytical tests. The significance level was considered <0.05 in all tests.

RESULTS

In this study, 30 clergies from Qom Seminary attended 2-day training workshops. The clergy were invited to participate in the workshop following an invitation from the Qom Seminary Services Center. Thirty questionnaires were completed on the 1st day, 30 questionnaires were completed after the training, and four questionnaires were incomplete and excluded from the study.

The participating clergy's average age was 35.73 ± 3.26 years. All but one of the participants were married and five of them were female. The participants had completed the basic and higher Islamic seminary education (**Table 1**).

The results exhibited that the attitude domain and awareness before the workshop was 26.30 ± 1.90 and 8.31 ± 1.64, respectively. Also, Mean ± SD of attitude domain and awareness after the workshop were 29.73 ± 1.95 and 10.70 ± 1.18, respectively. The data analysis indicated a significant statistical difference between clergy's attitude and awareness scores before and after organizing the workshop ($p < 0.01$) (**Table 2**).

TABLE 1 | Demographic variables of the clergy participating in the workshop.

Variable		No. (%)
Gender	Female	5 (20)
	Male	25 (80)
Marital Status	Single	1 (3.3)
	Married	29 (96.7)

TABLE 2 | Mean and standard deviation (M ± SD) of the clergy's awareness and attitude pre- and post-workshop.

	Awareness score (M ± SD)	Attitude score (M ± SD)
Pre workshop	8.31 ± 1.64	26.30 ± 1.90
Post workshop	10.70 ± 1.18	29.73 ± 1.95
P-value	<0.001	<0.001

TABLE 3 | Correlation between awareness and attitude score pre- and post-workshop.

		Awareness	
		R	***P*-value**
Attitude	Pre-workshop	0.566	0.001
	Post-workshop	0.426	0.030

Pearson's coefficient test revealed that there was a significant relation between awareness and attitude score before and after holding the workshop (**Table 3**).

DISCUSSION

The present study was conducted in Qom City, as the core of Shiite Muslim community in Iran and Eastern Mediterranean Region. In some countries, clergy have a remarkable role in interacting with the community, based on some studies on improving mental health (28). The present study, which was designed to examine the clergy's viewpoint toward the mental illnesses and the consequent stigma in the most considerable religious base in the country, illustrated that one strategy for reducing mental illness stigma in religious communities can be holding training sessions provided for promoting the clergy's awareness and attitude of mental health. Previous studies have exhibited a long background of mutual distrust between mental health scholars and religious clergy (22), however, it seems that such viewpoints have changed slightly. A study in America, following a training workshop held by religious clergy for psychiatric assistants, focused on the importance of collaboration with clergy and the important role of religion in enhancing mental health in the community (29). A study performed on older patients in 2005, highlighted the role of clergy in reducing mental illness stigma (30).

After a school shooting in Newtown, CT in America, a study investigated the clergy's performance in sermons. During the examination of the sermons, it was considered that clergy

emphasized the importance of social and emotional support and funding the mental patient costs (31). It was determined in another study that working services for depression treatment would be more prosperous and forceful in the presence of a church clergy (19).

What makes this collaboration more effective and productive is to achieve a common language and more of a mutual understanding from mental health scholars after training, along with the acceptance of more scientific awareness by religion professionals. Research has portrayed that many clergy, despite their desire to help mental health professionals, had not achieved an agreeable outcome due to their lack of scientific background (18, 24, 32).

Some clergy lack acquired awareness or do not have willingness in referring patients to professional centers (23). But if clergy consider themselves as part of a mental health team member with doctors, nurses, and members of the treatment team, this confidence and participation may be increased (28). In many cases, the first referral of people suffering from mental disorders was to Christian (17) and Muslim (18) clergy.

Stigma can lead to poor attention by decision makers and stakeholders regarding mentally ill individuals (33). Previous studies have shown that fear and distrust from people suffering from mental disorders in society would be lessened with a better understanding of mental disorders among the general public (21). Our findings can promote the affairs of health policy makers in providing mental health education programs and community mental health services exploiting religious clergy and preachers.

Limitation of this current research include that clergy's skills, mental health education, and practice of clergy was not evaluated. Therefore, future studies should evaluate effectiveness of this course for the community and mentally ill individuals.

CONCLUSION

In the present research, the awareness and attitude of clergy toward mental health and stigma due to mental illness was relatively good and significantly increased by holding the workshop. There was a significant statistical difference between their awareness and attitude scores before and after the workshop ($p < 0.01$).

DATA AVAILABILITY STATEMENT

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

AUTHOR CONTRIBUTIONS

AT, AN, MN, and MK contributed to conception and design of the study. AS and AA organized the database. AY and MA performed the statistical analysis. JB wrote the first draft of the manuscript. AH, AR, and HS-h wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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ORIGINAL RESEARCH
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Evaluating the Effects of Experiencing Virtual Reality Simulation of Psychosis on Mental Illness Stigma, Empathy, and Knowledge in Medical Students

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Objectives: Applying technologies such as virtual reality (VR) in education has gained popularity especially in comprehending abstract and subjective phenomena. Previous studies have shown that applying a virtual reality simulation of psychosis (VRSP) is useful in increasing knowledge and empathy toward patients. Here, the efficacy of using VRSP in altering stigma, empathy and knowledge as well as side effects have been assessed in medical students in comparison with the routine education (visiting the patients).

Method: After attending one session of lecture about positive psychotic symptoms, medical students were allocated to two groups: experiencing one session of VRSP or visiting patients under supervision as routine practice in the ward. Before and after the first session and after the second one, questionnaires of knowledge, empathy and stigma were filled by students. Finally, the results were compared in two groups.

Results: Both interventions were effective in reducing stigma as well as increasing knowledge and empathy toward patients with psychotic experiences. VRSP could significantly reduce stigma and increase knowledge and empathy compared with the traditional visiting patients under supervision. The side effects were minimal and ameliorated right after the experience.

Conclusion: VRSP is an effective tool in decreasing stigma and increasing empathy and knowledge of the students and can be incorporated in psychiatric education with minimal side effects.

Keywords: psychosis, stigma, empathy, virtual reality, simulation, medical education, E-learning

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INTRODUCTION

Psychiatric disorders are associated with an overwhelming stigma, not only among general population, but also within healthcare providers and students especially the novitiates (1–3). Stigma directly affects help-seeking behaviors (4–6). In case of mental health problems, holding negative attitudes toward psychiatric disorders and perceived negative social consequences related to them, leads to denial, which subsequently results in postponing the necessary treatment (4). Even the attitudes, manners, and speech of mental health professionals can nourish stigma, which is called the "Iatrogenic stigma" (7, 8).

Anti-stigma movements have proposed different interventions to overcome the stigma toward patients, among which social interaction in combination with education is the most effective one (2, 9). Different curricula applied in psychiatric education have been shown to decrease stigma toward patients with mental illness through education as well as direct contact with patients (10, 11).

Recent literature suggests that simulations of first-hand experiences in virtual environments can decrease implicit stereotypes and reduce stigma (9, 12). Utilizing compound contact-based interventions such as watching film and live contact can considerably improve outcomes of attitude and knowledge toward mental illness (2, 13). There are, however, concerns over a mere simulation of psychotic disorders without any education as such interventions may prove counterproductive (12). This is an important criticism that efforts of reducing stigma through focusing on first-hand experience simulation, might lead to an excessive focus on symptom experience without appreciation for the "whole person" that one might obtain from a contact experience.

Educational methods have improved dramatically in recent years and incorporating innovative technologies such as virtual reality (VR) into traditional pedagogic methods has gained popularity. Literature suggests that utilizing VR, as an immersive environment, can increase motivation, engagement, and the time spent for learning in students. Using VR in education promotes students' ability in cognitive tasks and indorses affective and psychomotor skills (14, 15). VR can also improve students' knowledge, empathy, and reduce stigma toward patients with mental health disorders (16, 17). The graphical quality and the sense of presence (immersion) have been proposed to be important factors affecting learning outcomes (14, 18).

Virtual environments have several applications in psychiatric education. Simulating a complex or nontangible condition for students to get involved in -as a first-person experience- is one of these applications (16, 17). Positive psychotic symptoms such as hallucinations and delusions are subjective and complicated experiences that are difficult to understand. Hallucinations are perceptions without any external source and delusions are misbeliefs without any factual evidence to support them (17, 19, 20). These symptoms present not only in psychiatric disorders but also in other medical conditions such as hearing loss or neurological conditions (20, 21). Despite the prevalence, students often complain of the difficulty of understanding the symptoms. On the other hand, holding negative attitudes towards patients experiencing psychotic symptoms (stigma) is common among students and health care providers (7, 17, 22, 23).

Limited studies have assessed the outcomes of incorporating VR in routine education in reducing stigma toward patients. Previous studies suggest that simulating first-person experiences in VR can effectively increase knowledge of the symptoms and empathy toward patients with minor side effects such as mild cybersickness (17, 24). For instance, Formosa et al. simulated positive psychosis symptoms in a VR setting; their study suggests that one session of experiencing it could increase students' knowledge, attitude, and improve empathy toward patients with psychosis (16). In their study, however, questionnaires only were applied before and after applying VR; where VR stands in comparison with the current methods of education is still under question.

In another study, Yellowlees et al. developed a VR psychosis simulation on an internet platform and showed the user-friendliness and feasibility of applying it as a practical method (24). In their study, participants filled a questionnaire only after experiencing the simulation so there was no comparison whether before or after or with other methods, and the study population was only limited to a certain group of internet users.

In this study, after simulating auditory hallucinations with persecutory content and reference delusion in a VR setting, we compared one session of virtual reality simulation of psychosis (VRSP) to the routine educational program- that is visiting patients under supervision as its counterpart in altering stigma, empathy, and knowledge about psychosis in medical students as well as evaluating potential side effects.

MATERIALS AND METHODS

In this project, we assessed the effects of experiencing one session of virtual reality simulation of psychosis (VRSP) on stigma, empathy, and knowledge in medical students in comparison with the traditional learning style; that is, visiting patients at the psychiatric ward. In the first phase of the study, we have developed a simulation of psychotic experience in a VR setting with a scenario based on the real experiences of the patients and the consensus of a psychiatrist team. After providing consent, 10 patients with schizophrenia in remission were interviewed by two different psychiatrists for their experiments during their last psychotic episode. The documents were assessed by a panel of four psychiatrists for extracting the most prevalent themes. Among those, the ones that could be reproduced in a simulated environment (such as auditory hallucinations and some form of delusions) were chosen to be the content of the experiment. The VR environment provided a three-dimensional, 360-degree video that was displayed by a VR headset mounted on the user's head (**Figure 1**). The basic graphical environment (patient's home) was designed by the objects needed for the scenario (modeled by 3D Max, Maya, and After Effect software). For the production of special effects (for example: displaying the other homeowner, broadcasting meteorological reports on television, etc.), we utilized 4K resolution filming technology. The sounds were recorded using the Qubis software; to maximize the clarity and orientation of the sounds, each one tailored to different

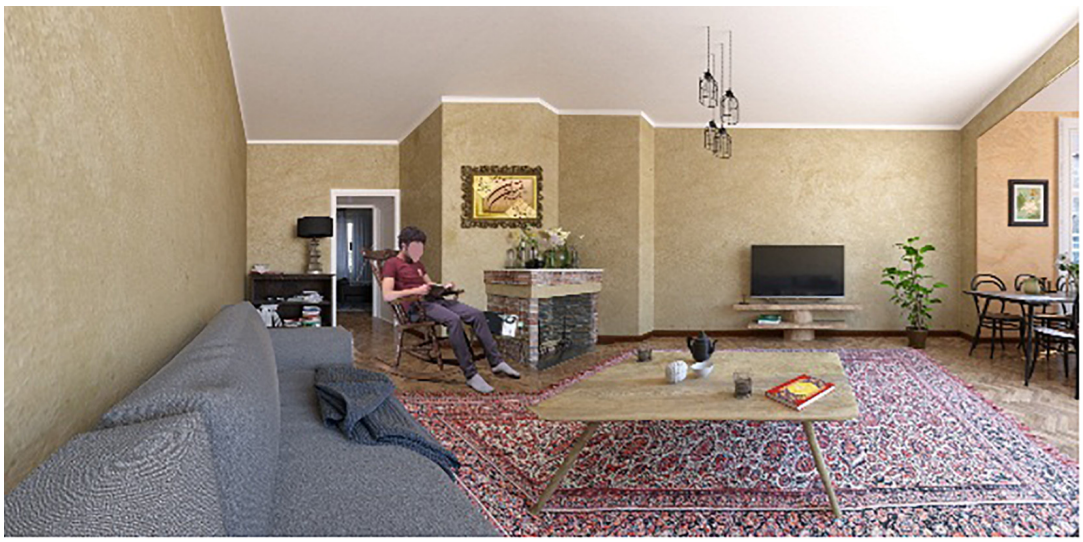

FIGURE 1 | The simulated environment used in this study.

positions to the user. After rendering, the final VR file was easily accessible through any mobile operating system (Android or iOS) and could be displayed by a VR headset for 4 and a half minutes.

In this scenario, the experiencer assumes herself/himself in a position of a person who hears voices with persecutory content and experiences the TV news host sending her/him messages (delusion of reference) which were the most prevalent experience based on our interviews and are some of the prevalent forms of delusions and hallucinations (20, 21, 25). At first, the person assumes that she/he is sitting on a couch in a living room of an apartment which has been designed with some elements of Iranian culture, such as red carpet, calligraphy on the wall, and some famous Persian books on the table and in the shelf that cause the experiencer feeling familiar with the environment. The atmosphere is as much as possible neutral (with no dark color that causes feelings of horror), so it can be similar to real life. There is an actor, sitting in the living room, talking and leading the experiencer through several occasions, such as turning on/off the TV or asking her/him to do some favors, such as moving into the kitchen where some hallucinations happen.

Auditory hallucinations (three-dimensional sounds) start with the voice of knocking on the door several times and some voices (both adult male and female with real-life tone), asking the participant not to open the door as there might be some neighbors trying to hurt her/him. Voices also talk about the actor and tell the participants that he might have some intentions to hurt her/him (persecutory content). When the actor turns on the TV to watch some news, the host of the news keeps addressing the participant and trying to undervalue her/him with her words (simulating the process of delusions of reference). After the scenario leads the participant to the kitchen, the voices comment on her/his actions in the kitchen as the third person (running commentary).

Medical students in Iran train psychiatry during their clerkship by attending to the visits by an attending psychiatrist (a Faculty) or psychiatry residents as passive observers. That is, the attending or the psychiatry resident visits the patients and the trainees observe the process of interviewing and examining mental status. After several sessions of observation, they can interview one or more patients to gain psychiatry history for their final project. The first stage (passive observation) has been compared to VRSP in the current study.

Data Gathering and Sample Size Calculation

The study population was all the 2nd and 3rd year medical students in the Birjand University of Medical Sciences, who haven't passed any psychiatry course or training before. The inclusion criteria were: having no previous history of severe psychiatric disorders themselves or in their first degree families. No previous history of chronic types of headaches, vertigo or seizures. The exclusion criteria were developing any side effects during the experience. This study was approved by the Research Ethics boards of Birjand University of Medical Sciences (IR.BUMS.REC.1397.174).

Using Cohen standardized effect sizes, sample size was calculated 64 in each group and considering 10% attrition rate, the total of 72 students participated in each group [alpha = 0.05, power = 0.80, and Cohen's d = 0.5 (a medium effect)]. After providing written informed consent, all participants who enrolled in the study with the convenient method of sampling took part in one session of a lecture on theoretical concepts targeting positive psychotic symptoms. The students were cluster-randomized and allocated to two groups: experiencing one session of VR Simulated Psychosis (VRSP) or visiting patients under supervision as the routine practice in the ward. Before and after the first session and after the second one, questionnaires of knowledge, stigma, empathy, and side effects were filled by students. Finally, the results were compared in two groups. We

also conducted a telephone follow up after 1 week and 1 month to record the participants' experience of any long-lasting side effects, as stressors can be related to the psychiatric symptoms if there is a reasonable temporal relationship to it, which according to The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) is considered 1 month (26).

As knowledge of basic psychological facts can be measured quantitatively (16, 24), participants completed a pen and paper educational achievement test, designed to assess knowledge of definitions and examples of delusions and hallucinations based on DSM-5 criteria. Two independent research assistants scored students' answers by using a scoring guide to reduce the potential of subjective interpretation. In case of any discrepancy, the third rater would score the items independently. Inter-rater reliability analysis was done, and the average amount was counted for each student as the score of knowledge. The Persian version of the "Mental illness stigma by world psychiatric association" was used to assess positive and negative attitudes towards patients with psychotic symptoms. Its validity and reliability in Farsi have been documented by Nojomi et al. (27, 28). Also, the Persian version of the Jefferson Scale of Physician Empathy- students (S-version) was applied, which was validated by Shariat et al. (29, 30). For side effects, seven items were assessed by a 7-point Likert scale anchored between "1" indicating "none" and "7" signifying "extremely high". Blurry vision, headaches, nausea, and dizziness were assessed as general side effects (Cybersickness) and difficulty in accepting reality, paranoia, and any change in auditory perception as psychological side effects. Researchers were trained to monitor participants in the VR group for distress and participants were told that they can discontinue anytime they felt distressed. The telephone follow-up was conducted according to the same checklist 1 week and 1 month after the study; if any of the participants reported any symptoms that has bothered them, could get a free visit by a psychiatrist or neurologist for further evaluations.

Statistical Analysis

Analyses were performed by Statistical Package for Social Sciences (SPSS version 21.0). The independent *t*-test was performed to compare means in each stage. To consider the role of potential confounders, a univariate analysis of covariates was performed to compare means at the final assessment and the effect size was calculated. The descriptive statistics were also reported as means and standard deviations. In all analyses *P*-value < 0.05 was considered statistically significant.

TABLE 1 | Demographic characteristics of participants.

		Group 1: visiting patients	Group2: VRSP	Total	*p*-value
N		72	72	150	
Age		20.38 (± 1.04)	19.90 (± 1.47)		0.843
Gender	Male	*N* = 30 (20.8%)	*N* = 35 (24.3%)	*N* = 65 (45.1%)	0.402
	Female	*N* = 42 (29.2%)	*N* = 37 (25.7%)	*N* = 79 (54.9%)	

VRSP, Virtual Reality Simulation of Psychosis.

TABLE 2 | Means and standard deviations of scores in two groups in 3 stages of assessment.

		Group	*N*	Mean	Std. Deviation	Std. Error Mean
Knowledge	Level 1	Visiting patients	72	2.0833	2.47665	0.29188
		VRSP	72	2.3750	2.76006	0.32528
	Level 2	Visiting patients	72	14.1944	2.98182	0.35141
		VRSP	72	14.2778	2.87888	0.33928
	Level 3	Visiting patients	72	14.8889	2.96722	0.34969
		VRSP	72	16.5139	2.63237	0.31023
Stigma	Level 1	Visiting patients	72	4.5694	1.30898	0.15426
		VRSP	72	4.3889	1.54332	0.18188
	Level 2	Visiting patients	72	4.3056	1.29614	0.15275
		VRSP	72	3.9583	1.52387	0.17959
	Level 3	Visiting patients	72	3.8194	1.69777	0.20008
		VRSP	72	3.5972	1.21794	0.14354
Empathy†	Level 1	Visiting patients	72	115.7500	13.48943	1.58974
		VRSP	72	118.8056	12.49973	1.47311
	Level 2	Visiting patients	72	119.2500	14.09600	1.66123
		VRSP	72	122.1667	13.52619	1.59408
	Level 3	Visiting patients	72	121.9861	12.38751	1.45988
		VRSP	72	128.7639	9.39657	1.10740

VRSP, Virtual Reality Simulation of Psychosis.
Level 1: Pretest.
Level 2: Assessment after one session of theory education.
Level 3: Post interventions test.
†*Based on the Jefferson Scale of Physician Empathy- students (S-version).*

RESULTS

Table 1 shows the demographic characteristics of participants in each group. The mean age of the two groups that visited patients and experienced VRSP were 20.38 ± 1.04 and 19.90 ± 1.47 respectively and had no significant difference ($p = 0.843$). 65 males and 79 females participated in the study and the analysis of the distribution between groups showed no significant difference between groups ($P = 0.402$) (**Table 1**). The mean scores and standard deviations of knowledge, empathy, and stigma in different stages of assessment have been shown in **Table 2**. There were 3 levels of assessment and for convenience, we showed them as level 1 indicating pretest, level 2 indicating assessment after one session of theory education, and level 3 as post interventions test. There was no significant difference between the scores of the two groups at baseline in variables of knowledge ($p = 0.506$), empathy ($p = 0.161$), and stigma

TABLE 3 | Univariate analysis of covariates for the assessments.

	Source	Mean square	*F*	*P*-value	Effect size	Observed power
Knowledge 3	Corrected model	301.390	137.000	0.000*	0.746	1.000
	Intercept	101.537	46.155	0.000	0.248	1.000
	Knowledge 1	5.113	2.324	0.130	0.016	0.328
	Knowledge 2	730.640	332.120	0.000	0.703	1.000
	Group	84.772	38.534	0.000	0.216	1.000
	Error	2.200				
Stigma 3	Corrected model	28.455	17.597	0.000*	0.274	1.000
	Intercept	16.721	10.341	0.002	0.069	0.891
	Stigma 1	8.814	5.451	0.021	0.037	0.640
	Stigma 2	20.274	12.538	0.001	0.082	0.940
	Group	0.112	0.069	0.793	0.000	0.058
	Error	1.617		0.000		
Empathy 3†	Corrected model	3071.704	44.783	0.000*	0.490	1.000
	Intercept	4990.712	72.761	0.000	0.342	1.000
	Empathy 1	264.938	3.863	0.051	0.027	0.497
	Empathy 2	2365.912	34.493	0.000	0.198	1.000
	Group	922.239	13.446	0.000	0.088	0.954
	Error	68.590	44.783	0.000	0.490	1.000

VRSP, Virtual Reality Simulation of Psychosis.
Level 1: Pretest.
Level 2: Assessment after one session of theory education.
Level 3: Post interventions test.
**Significant.*
†*Based on the Jefferson Scale of Physician Empathy- students (S-version).*

($p = 0.450$) based on the *t*-test analysis. The univariate analysis of covariates (ANCOVA) showed that VRSP could significantly increase knowledge ($p < 0.000$), decrease stigma ($p < 0.000$), and improve empathy ($p < 0.000$) toward patients in comparison with one session of visiting patients under supervision (**Table 3**). **Table 4** shows the side effects of one session of experiencing VRSP. Most of the participants experienced no side effects and the minor side effects were reported by a few participants, which subsided quickly. No signs of distress were reported by research assistants and none of the participants withdrew from the study due to personal distress. In the follow-up study, neither after 1 week nor after 1 month, none of the participants in the VRSP group reported any problem asked according to the checklist, so there was no need for an in-person visit by specialists.

DISCUSSION

The aim of this study was to assess the effects of experiencing one session of virtual reality simulation of psychosis (VRSP) on the stigma, empathy, and knowledge of medical students towards patients with psychosis in comparison with the routine training - that is visiting the patients in wards under supervision- as well as assessing any side effects. Highlighting the prominence of this study, to the best of our research, this is among the few head-to-head studies, examining the efficacy of incorporating virtual simulation in training, compared with routine educational program. There is minimal research regarding head-to-head studies comparing the two modalities (21).

In line with previous studies, the findings of the current study suggest that applying one session of VRSP can increase knowledge about psychosis (16, 17, 24), and this increase is significantly more than one session of visiting patients under supervision. Students, in this study, had no previous knowledge of the psychotic symptoms and this could reduce the potential bias in assessing the knowledge. VR has usages such as learning and training based on the constructivism theory of learning. VR can increase users' knowledge about some concepts that are complicated and difficult to understand. In mental health disorders, subjective symptoms such as delusions and hallucinations are tough to perceive (16, 31). The constructivist perspective that VR fundament on, emphasizes building the knowledge based on the real-life experiences and VR can provide a semi-real-life environment for students to experience symptoms first hand.

To further explain the findings on knowledge, simulation in VR was consistent, that is all students experienced all the simulated symptoms in one session. Visiting patients under the supervision, on the other hand, has some limitations such as patients might have different mental status in each visit, leading to presentation of different symptomatology in each session (32). Moreover, patients might not be willing to or feel safe enough to reveal their inner experiences in a crowded setting, resulting in non-cooperativeness. Patients experience variety of symptoms and students have to observe and/or visit a number of patients in order to get familiar with a complete picture of the disorder

TABLE 4 | Assessing side effects of one session of experiencing Virtual Reality Simulation of Psychosis.

Likert Scale Side effects	1	2	3	4	5	6	7
Blurry Vision	59 (81.9%)	6 (8.3%)	4 (5.6%)	3 (4.2%)	0	0	0
Headache	61 (84.7%)	10 (13.9%)	1 (1.4%)	0	0	0	0
Nausea	68 (94.4%)	4 (5.6%)	0	0	0	0	0
Dizziness	60 (83.3%)	9 (12.5%)	3 (4.2%)	0	0	0	0
Difficulty in accepting reality	60 (83.3%)	8 (11.1%)	4 (5.6%)	0	0	0	0
Paranoia	67 (93.1%)	3 (4.2%)	2 (2.8%)	0	0	0	0
Any change in auditory perception	68 (94.4%)	4 (5.6%)	0	0	0	0	0

manifestation. Immersive experiences in VR, can add to the benefits of the visits by providing the facility to experience more symptoms and removing distractions (14, 18, 33). The key point here is that VRSP cannot and should not assumed to replace visiting patients, but can be seen as an effective pedagogical tool that is used alongside visiting patients to address the limitations that students might face in wards.

In this study, both groups showed a reduction in stigma score after one session of visiting patients and after VRSP. In VRSP, however, the stigma scores decreased significantly compared with visiting patients. Whether and to what extent the direct contact with the patients affects stigma reduction is still controversial. On one hand, some literature suggest that direct contact with patients- whether it is a real in-person contact or a virtual one-can decrease stigma (2); anti-stigma movements propose different forms of interventions, among which social interaction in combination with education is the most effective one (2, 9). Also, curriculums applied in psychiatric education have decreased stigma toward patients with mental illness through education as well as direct contact with patients (10, 11). On the other hand, some literature suggest that mental health care givers that work in inpatient settings, are prone to have more stigmatizing attitudes toward patients due to several reasons such as burnout and associative stigma (3). Clinicians who work in inpatient settings often tend to work with patients with long-term conditions and worse prognosis which enhances the phenomena of "the clinician's illusion." (34), which might explain the mentioned stigma to some extent (3). In this study, the sample consisted of medical students without any history of psychiatric conditions themselves or in their first degree family members, therefore the mentioned mechanism of familiarity that might lead to increase stigma, was eliminated in this study.

There are lack of evidence to explain the mechanism of associative stigma- that is the phenomena of increased stigma in the first degree families of patients with severe psychiatric conditions and care givers. the proposed mechanisms consist of the burden of these disorders to families as well as burnout in care givers (3). The mediating role of empathy in theses process has not been explored yet. In this study the empathy scores increased in both interventions and whether the increase in empathy can be a mediating factor for decreasing stigma should be explored in future studies.

Some qualitative studies has extracted important themes mirroring associative stigma among mental health care providers: devaluating the occupation, media representation, and assumptions/expectations about the job. Publicly, psychiatry practice is frequently perceived as unproductive or even destructive (3). Moreover, medical students might see psychiatry as low status and non-priority (35). Applying technologies, such as VR, has shown to increase the motivation of students. However, assessing whether incorporating such technologies in psychiatric education would modify such attitudes needs more in depth studies.

Recent literature suggest that simulations of first hand experiences in virtual environments can decrease implicit stereotypes and reduce stigma (9, 12). Utilizing compound contact-based interventions such as watching film and live contact can considerably improve outcomes of attitude and knowledge toward mental illness (2, 13). This is consistent with our findings, confirming our hypothesis that using simulations incorporated into routine medical education can improve knowledge and attitudes towards stigmatizing others. There are, however, concerns over mere simulation of psychotic disorders without any education (12); in a study on the effects of a virtual reality simulator on perceptions of schizophrenia, Kalyanaraman et al., argued that using simulations of hallucination, without any education to participants might increase negative attitudes toward patients with schizophrenia (12). Efforts of reducing stigma through focusing on merely simulating the symptoms, might lead to an excessive focus on symptom experience without appreciation for the "whole person" that one might obtain from a contact based-experience. Therefore, we believe that education must be an important component in such interventions.

It is argued that simulations that portrays psychosis as a terrifying experience with dramatic environmental features in a dark or horrifying setting- in contrast with using neutral environmental cues-, might have negative effects on participants attitude towards patients (12). These are important ethical concerns; increasing literature suggest that interventions that seek to enhance empathy are required to represent the symptoms in an unbiased way and according to the real experiences of the subjects with whom empathy is to be enhanced. Using more realistic environmental features is more similar to the real experiences of people with psychotic disorders. In a study of simulating symptoms in an augmented reality (AR) environment, where the hallucinations are experienced in the actual environment (9), in line with our findings, simulation showed to be a promising approach in reducing stigma.

In recent years, VR studies have focused on promoting some concepts that are essential in human relationship such as empathy. The ability to empathize is a crucial skill for all mental health professionals and affects all aspects of psychiatric and psychological interventions (36, 37). In this study, both groups showed increase in empathic abilities-assessed by the Jefferson Scale of Physician Empathy- students (S-version). The VRSP group had significantly more empathy toward patients than students who visited patients under supervision. This confirms previous findings that suggests application of simulation of psychosis can increase empathy among students (16, 17) and general population (24).

Empathy has been defined as having non-judgmental attitude and understanding patients' viewpoints and emotions. It is a dynamic interpersonal process, depending on the relationship. It is also a multidimensional construct containing cognitive and affective components (38, 39). When arguing about training empathic abilities, it is essential to make a vivid discrimination between potential and actual skills. Empathy must be cultivated in a proper environment with required elements and support (31, 40). Studies suggest that the empathy increases with the years of experience. That is the more you have the firsthand experience with patients, the more you have the opportunity to develop empathy (41).

VR is a proper method for empathy training (42). VR technology can help student feel patient mental situation as if

it's their own and provide a judgmental free environment to learn through exploring one experience as many times as it is needed to be learned. As it is retrieved from constructivist theory, VR has elements that the person can reshape his inner world according the new and unique experience he passed in VR. Experiences of embodiment in an immersive VR environment (EVR) allow users to literally step into the shoes of others and see the world from their perspective. Research on EVR has explored how manipulations of the senses can be used to modulate empathic responses. Experiences of stepping into the shoes of outgroup members have shown significant plasticity of empathic abilities (43).

For training empathy there are some abilities that need to be developed such as (perspective taking between group empathy, compassion, self-regulation) and some that need to be evaded such as subjective distress (31). While the aforementioned skills can improve empathy toward patients, personal distress might even cause stigma through increasing avoidant responses. Developing a sense of familiarity with others experiences can increase the feeling of affiliation to that group which make it easier to empathize with that group (31).

Empathic responses are crucial for a productive doctor-patient relationship. However, unhealthy empathic reactions might induce personal distress that cause burnout and stigmatizing attitudes that cause avoidant responses (39, 44, 45). Reasonable amount of distress, however, is needed for feeling empathy toward others (31, 46). Therefore, it is crucial to assess whether experiencing a simulation of psychosis has any side effects such as personal distress or other psychiatric conditions. In this study none of the participants in the VRSP was withdrawn from the study due to personal distress and no personal distress was reported by observers.

Consistent with previous studies, the participants only reported mild general side effects (Cybersickness) which ameliorated quickly after several minutes (16, 47). None of the participants reported any psychosis-like symptoms, neither right after the experience, nor after 1 week and 1 month of follow-up. This is one of the first studies addressing psychiatric side effects and despite the rigorous inclusion criteria, the results are promising.

There are some limitations in this study that should be addressed in future studies. First of all, the VRSP in this study was only a passive experience and the participants couldn't actively explore all the components of the environment. It was done because we wanted to compare the experience with the passive observation during the clerkship and the future studies can make the comparison with more interaction between the participants and the virtual environment. With regard to the definition of stigma, in this study only attitudes and knowledge of students were measured. The behavioral component of stigma such as intended social distance or micro-aggressions needs to be addressed in future studies. Also, these results were only obtained in a population with no previous knowledge or contact with patients with severe mental health problems. The replicability in other populations is under question and whether such relationship would show different result must be explored.

In conclusion, applying simulation of psychosis can be an effective tool in reducing stigma, increase knowledge, and empathy in medical students and it seems to be a good choice to be incorporated in routine educational practice.

DATA AVAILABILITY STATEMENT

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

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Research Ethics boards of Birjand University of Medical Sciences (IR.BUMS.REC.1397.174). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

SM has provided the main idea of the study. MZ-B and SM have contributed significantly in designing and conducting the project as well as writing and reviewing the manuscript. AE, MR, RM, RA, MM, and FM has contributed in conducting the study, gathering the data, and drafting the manuscript. AM, MK, and AE has contributed in conducting the study and reviewing the manuscript critically. MN and AS has contributed significantly in statistical analyzing and drafting. All authors contributed to the article and approved the submitted version.

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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.2022.880331/full#supplementary-material

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Suicide, Stigma and COVID-19: A Call for Action From Low and Middle Income Countries

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Suicide is a global health issue that needs to be addressed. The COVID-19 pandemic has resulted in an increased mental health burden. Stigma has obstructed efforts to prevent suicide as individuals who need urgent support do not seek appropriate help. The influence of stigma is likely to grow in tandem with the COVID-19 pandemic. The stigmatization of persons with mental illnesses is widespread worldwide, and it has substantial effects on both the individual and society. Our viewpoints aim to address the probable link between stigma and suicide in the wake of the current pandemic and propose ideas for reducing suicide-related stigma.

Keywords: suicide, stigma, COVID-19, mental health, psychiatry

INTRODUCTION

Suicide is one of the leading causes of death globally, with this trend being more pronounced in younger people and low and middle income countries (LMIC). According to the World Health Organisation (WHO), over 77% of suicide deaths worldwide occur in LMIC, with more than 700,000 suicide deaths reported in 2019 and 173,347 in India alone (1). Suicide is thus considered a global public health concern.

COVID-19 pandemic was the most pressing issue faced in the 2020–2022 period, and it had a detrimental effect on communities, including patients and healthcare workers. Pandemics are not just medical experiences; they cause interference in nearly all biopsychosocial dimensions. According to the WHO, until May 18, 2022, there have been approximately 523 million confirmed cases of COVID-19, and the disease has caused the death of more than 6.27 million people worldwide. LMICs have suffered more intensely with the pandemic, accounting for many cases and deaths. For instance, the death count in Brazil surpassed 665,000 and 325,000 in Mexico; in India, the number is approximately 520,000, and in Iran, more than 141,000 have died due to COVID-19 (2). In addition to the impact of the virus on the mental health of affected populations, social distancing, quarantine and other similar measures used to control the spread of the virus also

imposed significant negative psychosocial consequences such as post-traumatic stress disorder and depression (3).

The mental health burden has increased due to the COVID-19 pandemic, and communities worldwide require additional psychosocial support. This paper highlights the stigma and discrimination associated with suicides in COVID-19 and how it plays a core role in managing suicidal risk in the community.

COVID-19: The Potential Risk of Suicide

There is debate about the increase in suicidal ideations after the beginning of COVID-19. A multicenter study in 21 countries reported that the numbers have remained unchanged or declined in the early pandemic compared to the pre-pandemic period in high-income and upper-middle-income countries (4). According to a systematic review of many studies about suicidal behavior related to the COVID-19 pandemic from November 2019 to September 2020 that included 120,076 persons, there has been an increase in suicidal ideation rates in comparison with the period before the pandemic, with a pooled prevalence of approximately 12% (5). The same study described several risk factors associated with suicidal ideation during the pandemic, including quarantine, loneliness, sleep issues, poor social support, and mental and physical exhaustion (5). Social distancing and subsequent social isolation, economic problems due to lockdown policies and unemployment, social stigma and discrimination, fear of the virus, stress, and the burden of work that some professionals have experienced have also been pointed out as potential factors associated with suicide during the COVID-19 pandemic (6). Certain vulnerable groups are at an increased risk of suicide and other self-harm related behavior, such as the elderly, persons with mental disorders, healthcare professionals, the homeless, and migrant workers (6). During the pandemic, they should be the target of specific preventive measures by the services.

Stigma and Suicide

Stigma is a profoundly discrediting attribute and encompasses several components, i.e., labeling, stereotyping, separation, status loss, and discrimination (7, 8). Stigma can also be classified into public stigma and self-stigma (9). The former refers to the general population's reaction toward people with devalued characteristics, while the latter occurs when people with these devalued characteristics endorse the public attitudes and experience the negative consequences themselves. Stigma has been shown to display deleterious effects; for example, it has been shown to harm the self-esteem of those with mental illness (10). Public stigma may lead to social rejection, which leads to inequality in employment, access to health care and social participation (11). Stigma may be reduced by three approaches, i.e., protesting, education, and avoiding isolation (12). By protesting against inaccurate information held toward the devalued individuals, educating with the correct information and increasing contact between the public and the devalued individuals, the stigma is likely to diminish in certain settings.

The stigmatization of people with mental disorders is prevalent worldwide and leads to severe consequences for both the individual and broader society. Stigma in itself has a bidirectional relationship with mental illness and suicidality. Furthermore, patients with mental illnesses often face stigmatization, while on the other hand, stigma can precipitate mental illness and suicide (13). In addition, suicide is associated with stigma, which can manifest not only in suicide survivors but also in family members and close friends of victims of suicide. Thus, stigma may bring an additional burden to an already distressed individual, imposing stereotypes, distrust, a bad reputation, and a mark of disgrace, which can be produced by external members of the society or by the person her/himself (14). Suicide has also been equated with crime, punishment or sin, perpetuating stigma and impairing help-seeking (15). Stigma can lead to demoralization, feelings of isolation, loneliness, and hopelessness, leading to an increased risk of suicide (16). Also, legislation in certain nations criminalizing suicide is responsible for increasing stigma. Considering that stigma is also associated with ignorance and negative attitudes toward a specific phenomenon, it is essential to educate the public about suicide, associated factors, treatment and preventive strategies, and stimulate seeking care for those in need during the COVID-19 pandemic (16). It has been observed that financial crisis, unemployment, and poverty are the most prominent risk factors for suicide during the COVID-19 pandemic (17, 18).

COVID-19 and Associated Stigma

Isolation, physical distancing, lockdown and unemployment can be very demanding. COVID-19 has been an "infodemic" where misinformation and fake news have led to fear and stigma that add to the current crisis (19). There have been concerns about stigma and discrimination in previous pandemics, and COVID-19 is no exception. Multiple reasons have been attributed, such as improper information about the spread of disease and increased fear and anxiety. This is further aggravated by measures like isolation and physical distancing, which are essential for preventing the spread of disease. The risk of losing a loved one can be extrapolated to social and moral circumstances, which can further cause stigma. However, the actual origin of stigma is complex and may extend beyond concepts such as social disability or moral transgressions (20).

Public health emergencies, such as this pandemic, are stressful for people and communities. Fear and anxiety about the disease could lead to social stigma, labeling, stereotyping, discrimination and other negative behaviors toward others. For example, stigma and discrimination can occur when people link a disease, such as COVID-19, with a population, community, or ethnicity (21). Stigma can also happen after a person has recovered from COVID-19 or been released from home isolation or quarantine. Identified factors related to stigma in the pandemic have been listed in **Table 1**.

Heightened Stigma Leading to Suicidal Behavior

The social and economic hardships during this pandemic have negatively affected psychological wellbeing. The pandemic has been thought to have increased the risk of suicide among the frontline workers, elderly, migrants, homeless, poor, persons with

TABLE 1 | Aspects that influenced increased stigma related to COVID-19.

Belonging to an ethnic or racial minority. E.g., in the United States, Asian Americans (21), people of Northeast India (40)
Who has tested positive for COVID-19 or were released from quarantine (41)
Gender and sexual minorities experience more significant disparities (42)
Emergency responders or healthcare providers (43)
Essential workers, such as delivery drivers (44)
Older persons, especially seniors living alone in care homes (45)
People with a disability or physical impairment (46)
People experiencing homelessness (47)

mental disorders, and substance use disorders (22). The fear of COVID-19 infection, social boycott and loneliness during the quarantine were significant risk factors for suicidal behavior (23). Stigma leads to social isolation and discriminatory behaviors and undermines social cohesion in society, limiting opportunities for social interaction. Durkheim's theory suggests that a breach in an individual relationship with society is a significant risk factor for suicide, and social integration has an inverse relation with the suicide rate (24). A study assessing the role of stigma in suicidal behaviors related to the interpersonal theory reported an indirect relationship between stigma to suicide-related perceptions (25). Further, the perceived burdensomeness and felt stigma contribute to suicide risk in vulnerable individuals (25).

Stigma instills feelings of hopelessness, loneliness, anxiety, and anger in people who have experienced it, making them more prone to self-harming behaviors. Due to the COVID-19 pandemic, patients with recognized psychiatric problems might be unable to take their medications, causing symptoms to worsen and an increased risk of self-harm (26). Domestic and intimate partner violence has escalated due to the pandemic, resulting in psychological suffering and thoughts of self-harm among vulnerable couples (27). A recent study in Bangladesh reported that several factors, including the death of family members due to COVID-19, financial distress, domestic violence, alcohol consumption, social isolation, inaccurate information, stigma, and pandemic-related fear, ignited fear of suicidality (28). **Figure 1** shows a proposed relationship between stigma and suicide during the COVID-19 pandemic. Since suicide is a complex and multidimensional problem, recognition and knowledge from various approaches help us explore the problem and contribute to meaningful intervention strategies (29).

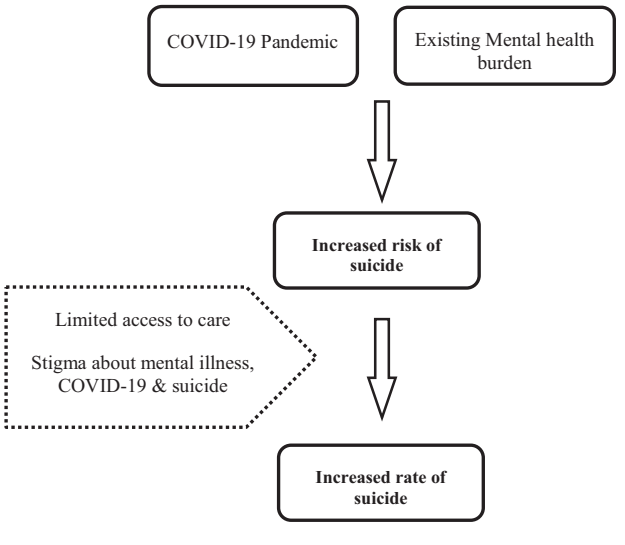

FIGURE 1 | Relationship between COVID-19 pandemic, stigma and risk of suicide.

Empirical Findings on Stigma During the COVID-19 Pandemic

An adapted version of the Chronic Illness Anticipated Stigma Scale found that those who anticipated higher COVID-19 stigma and endorsed COVID-19 stereotypes to a greater degree would be less likely to seek a COVID-19 test (30). The Social Impact Scale (SIS), a widely used 24-item measure of stigmatization used for patients with medical conditions and infectious diseases such as HIV, has been used (31). It was found that COVID-19 patients experienced stigma, social rejection, financial insecurity,

TABLE 2 | Recommendations to reduce the stigma associated with suicide in the context of COVID-19.

Individual
Targeting the vulnerable groups such as frontline workers, people affected by COVID-19, sexual minorities, and migrant workers during the ongoing pandemic
Focusing on accurate personal communications, correcting negative language that can cause stigma, and sharing reliable information with contacts and on social media
Community
Promoting non-judgmental and open communication with suicide survivors and their families
Monitoring misinformation related to suicide on digital and social media platforms and reporting them
Reporting hateful online content about suicides, victims, and survivors to host platforms
Checking images used in the media for health promotion showing diverse communities and does not reinforce stereotypes
Enforcing ethical reporting of suicide deaths with details of psychological support for readers
Community awareness campaigns such as infographics, street plays, online educational videos, skits, and debates about the prevention of suicides
Governmental
Maintaining policies and guidelines ensuring the privacy and confidentiality of those seeking help for mental health issues
Introducing state-wide risk assessment protocols and validated tools for screening risk to self
Advocating for the rights of individuals living with mental illness and other vulnerable groups
Thanking healthcare workers, responders, and others working on the frontline will significantly encourage them
National and international collaboration among the ECPs to promote research and disseminate evidence-based guidelines in mitigating suicide-related stigma
Structured programs to screen and manage common psychological disorders
Allocating funds for public mental health promotion focusing on suicide prevention, victims, and grieving families

internalized shame and social isolation. They also showed that depressive symptoms were positively associated with overall stigma levels (31).

Reducing Stigma

Given these deleterious effects of stigma, more actions should be implemented to reduce the effect of stigma on individuals with suicidal behavior, enabling them to seek help. To date, evidence shows that mass media campaigns and reporting of suicide can modify beliefs and attitudes toward suicide (32). On the other hand, interventions including social contact and education effectively reduce stigma, which would hopefully reduce the risk of suicide (33).

Since the psychiatrists have a significant role in providing mental health services, early-career psychiatrists (E) are in the frontline; they play leadership roles in health care development and suicide prevention (34). They have first-hand experience observing the deleterious impact of stigma on a suicidal individual, from help-seeking to treatment completion. Moreover, since the beginning of the pandemic, trainees and young specialists have been regularly redeployed to critical care units or COVID wards in addition to their work on psychiatric services. Suicide prevention training in ECPs, especially in the COVID-19 crisis, would add to the mental healthcare delivery package (35). ECPs are uniquely positioned to bring together knowledge regarding the pathophysiology and epidemiology of COVID-19 as medical doctors, a sound understanding of suicide and other mental health issues, and a comprehensive approach to stigma as psychiatrists, with an active, clear, and straightforward approach and informative presence in the social media (36).

Therefore, ECPs need to have a prominent role in the fight against COVID-19 and suicide-related stigma, informing, teaching, promoting research, and influencing public policies (37). This can serve as an integral suicide prevention approach during the present crisis, subject to further research. Moreover, ECPs can help screen for mental health conditions in at-risk individuals, such as recovered individuals, health care workers, and close contacts.

Organizing support networks for at-risk individuals may provide powerful stress-buffering effects at an interpersonal level (38). Educating frontline staff who care for individuals with COVID-19 about stigma and providing care and support to the staff may also help reduce stigma and its associated effects such as burnout and work stress. At the community level, ECPs should adopt educational approaches to debunk unscientific beliefs surrounding COVID-19 and to publicize the nature of stigma on COVID-19, mental illness and suicide through mass media campaigns. Activities such as giving a voice to stigmatized COVID-19 survivors will enhance the public understanding of the impact of stigma, reducing discrimination by the general public. Advocacy interventions to seek support and recognition from policy developers on measures to minimize inequalities faced by the stigmatized individuals are essential. ECPs should research the complex relationship between COVID-19 related stigma and suicide and provide more scientific evidence to implement interventions. Lived experiences of suicide survivors, stigmatized frontline health workers, and ECPs themselves matter to shape health and policy interventions (39).

Intervention

Finally, targeted interventions and a collaborative approach are required at various levels: individual, community and governmental. Suggested recommendations at each level are provided below in **Table 2**. By implementing these strategies, COVID-19 and suicide-related stigma could be addressed, reducing suicide risk in the community.

DATA AVAILABILITY STATEMENT

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

AUTHOR CONTRIBUTIONS

SS conceptualized and wrote the first draft. All other authors contributed equally to critical revision and writing of the final version.

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Attitude of Iranian medical specialty trainees toward providing health care services to patients with mental disorders

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Introduction: The stigma of mental illness has a negative impact on the diagnosis and treatment of these disorders. Considering the high prevalence of mental illness, the attitude of medical specialists toward mental disorders, who are front liners in diagnosing and treating these patients, is critical. Therefore, we examined the attitude of Iranian medical specialty trainees toward providing health care services for patients with mental illness.

Methods: We included 143 residents in the fields that have the most interactions with patients with mental disorders, including internal medicine, surgery, neurology, cardiovascular diseases, and psychiatry. A demographic checklist, as well as the opening minds scale for health care providers stigma assessment questionnaire, was provided, which measures five dimensions of improvement, social responsibility, social distance, exposure, and other (such as risk) in health care providers toward delivering the healthcare services to patients with mental disorders.

Results: The mean score of stigma for mental illness in medical specialty trainees was 61.36 ± 4.83 out of 100. Psychiatric residents have the least stigmatizing attitude (58.38 ± 3.54), and internal medicine and cardiology residents have the highest score, respectively, (62.96 ± 6.05, 62.45 ± 3.80). As for comparing subscales between specialties, only the social responsibility subscale showed a significant difference, with psychiatry having less stigma toward social responsibility (12.93 ± 2.01) than cardiology (15.09 ± 1.50) trainees.

Conclusion: The attitude of medical specialty trainees toward providing health care services for patients with mental illness is not uniform; internal medicine and cardiology residents have more stigmatizing attitude, while psychiatric residents have less stigmatizing attitude. It seems that not every contact could be useful in making a better attitude toward mental illness, but it needs

preconditions, like a structured contact that leads to positive outcomes. Anti-stigma interventions are needed to improve the attitude of medical specialty trainees toward providing health care services to patients with mental illness.

KEYWORDS

social stigma, community psychiatry, mental illness, medical students, medical education

Introduction

Stigma is described as a trait that society considers undesirable and distinguishes the stigmatized person from other members of the community to which they belong. Stigma persists today in attitudes toward patients with some medical and mental disorders. This is more obvious than in the medical profession (1–4). Mental illness stigma is a serious problem that affects patients and those around them, as well as health care institutions and staff working with people with mental illness. The more a person with a mental illness feels stigmatized, the lower his or her self-esteem, social adjustment, and quality of life (5, 6). Stigma also affects access to care, as people may not be willing to seek help despite mental or emotional problems, as it may be seen as a weakness or a failure (7, 8).

In addition, people with a mental disorder diagnosis suffer from the effects of discrimination in health care. Not only do people with mental illness benefit less from access to primary care, but there is evidence that physicians perform fewer physical examinations, laboratory tests, prevention, and treatment interventions on this population (9–11). For instance, general practitioners may feel less comfortable having a patient with schizophrenia than a patient with depression or diabetes. They may have a pessimistic view of the effectiveness of psychiatric treatment (12). Although stigmatization of mental illness among health care professionals has been studied less than the general population, existing evidence suggests that medical practitioners also hold a range of attitudes toward individuals with a psychiatric diagnosis like those held by the public (13). In some studies, professional experience has been associated with a more favorable attitude. Therefore, physicians who interact more with patients may understand diversity, and the point of view toward the stigmatized group members is essential for strengthening the positive attitudes (14, 15).

In Iran, studies have shown that roughly 1 out of 4 people suffer from at least one mental disorder (16). As with most other countries, a significant number of patients with mental disorders feel that they are humiliated, discriminated against, and socially rejected. This affects the patients and their families, who often experience unpleasant stigma. It is also observed that there is a correlation between the number of hospitalizations, duration of the disorder, and the type of the mental illness with the stigma that patients and their families encounter (17, 18).

Due to the high prevalence of mental disorders in the community and the negative impact of stigmatizing attitude toward this group of patients in the treatment and diagnosis of these disorders, we decided to implement the following study to use the results to help the process of diagnosis and treatment of patients with mental disorder and to uncover where more anti-stigma interventions are needed. It is a fact that, for many patients, particularly in low- and middle-income countries like Iran, the primary choice is to use a university medical health center. Knowing that medical specialty trainees carry out a large volume of the workload of these centers, this study examined the attitude of these health care providers who have the most direct interaction with patients with mental illness in Iran toward providing services for these vulnerable groups.

Methods

Design

This cross-sectional study was conducted at the Iran University of Medical Sciences, one of the three largest public medical universities in Tehran, Iran, in 2020 and 2021. We enrolled all medical specialty trainees of specialties that frequently are in direct contact with the patients with mental disorders, including internal medicine, surgery, neurology, cardiovascular disorders, and psychiatry. Inclusion criteria were ongoing studying at one of the courses mentioned above at Iran University of Medical Sciences, consent for participation, and a lack of a previous degree in a mental health-related major like psychology.

Data collection

An online survey package containing two questionnaires was sent to participants *via* an online link by email and/or social media. The participants were reminded for the first time within a week and a second time a month later.

Instruments

A personal demographic information checklist, including the following (age, gender, residency program, marital status, number of shifts per month, and self-report of personal experience with mental illness, family history of psychiatric disorder, and history of violence or serious personal problems), and the stigma assessment questionnaire.

Opening minds scale for health care providers

Opening minds scale for health care providers (OMS-HC) is a self-report questionnaire that evaluates attitudes and behavioral intentions toward people with mental illness. The main questionnaire was first confirmed with the Cronbach's alpha coefficient of 0.82. The full OMS-HC contains 20 items. Each item is responded as strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, and scored from 1 to 5. The total score ranges from 20 (least stigmatizing) to 100 (most stigmatizing). Items 3, 8, 9, 10, 11, 15, and 19 require reverse coding. This questionnaire consists of five dimensions: social distance (Items 1, 3, 16, 17, and 19), other concepts (overshadow of detection and dangerous; Items 2 and 15), detection (Items 4, 5, 6, 7, and 10), recovery (Items 8, 9, and 14), and social responsibility (Items 11, 12, 13, 18, and 20; 19, 20).

The OMS-HC questionnaire has been translated and validated by two groups in Iran, with the Cronbach's alpha: 0.76 and 0.87, respectively. While the translation of Kordloo et al. contains only ten items, we considered Vaghee et al.'s translation more suitable and used it in the study (21).

Ethical considerations

The study protocol was reviewed by the Iran University of Medical Science Ethics Committee and approved with the IR license.IUMS.FMD.REC.1399.228. The participants filled out the questionnaire voluntarily and anonymously after online consent for participation.

Data analysis

The collected data were analyzed using the statistical software analysis tool SPSS (version 16). For describing demographic information of the participants, results were expressed as mean and standard deviation (Mean ± SD) for quantitative variables and as a percentage for categorical qualitative variables. We used ANOVA for comparing the groups of trainees. The significance level was considered less than 0.05.

Results

A total of 143 medical specialty trainees were enrolled in the study, with a completion rate of about 70%, 58.7% female, and 41.3% male. The mean age was 30.72 (SD: 4.22). The average night shift per month for residents was 7.97 (SD: 3.51) nights. Other demographic features are presented in **Table 1**.

The correlation between the total stigma score and the demographic features was analyzed. Among the demographic variables, having a personal history of mental illness was the only associated and significantly meaningful with the total stigma score (P-value = 0.007, r = 0.150).

The mean total stigma score for mental illness in the participants was 61.36 ± 4.83 out of 100, ranging from 51 to 75 (95% C.I. 60.56–62.16). The mean score for each group is presented in **Table 2**. When comparing the total stigma score between different specialties, the ANOVA results showed a significant difference between other groups (P-value = 0.002). A further *post hoc* test was done to express the differences in detail, shown in **Table 2**. Psychiatric trainees have the least stigmatizing score compared to internal medicine and cardiology trainees, having the most stigmatizing score, respectively.

As for comparing different subscales of the scale within other specialties, it was only in the social responsibility subscale that there was a significant difference in different groups, with psychiatry having less stigma toward social responsibility (12.93 ± 2.01) than cardiology (15.09 ± 1.50) trainees (P-value < 0.001) as shown in **Table 3**.

Discussion

The mean total stigma score for mental illness in the participants in our study is 61.36 ± 4.83 out of 100, ranging from 51 to 75. Previous studies using the same 20-item OMS-HC questionnaire have shown fewer total stigma scores. For instance, a 2012 study by Kassam et al. showed that the mean total score among health care providers/trainees in Canada was 57.5 (95% C.I. 57.2–57.9). Scores ranged from 41 to 96, and the standard deviation was 4.8 (22). In another study, the median score among healthcare trainees other than medical students in Italy was 27, IQR [21;30] for the 20 items version (theoretical range, 0–80; 23). Similar studies on pharmacy students and medical students in Canada had total stigma scores of 46.7 (95% C.I. 44.5–48.4) and 48.6 (95% C.I., 47.5–49.8), respectively, (24, 25).

Being part of the middle eastern community, higher stigma scores in our study could be due to various factors such

10.3389/fpsyt.2022.961538

TABLE 1 Demographic features of participants in the study.

Residential program	Number (Frequency percentage)	Age Mean (standard deviation)	Night shift in a month (Standard deviation	Gender (Frequency percentage)		Marital status (Frequency percentage)		Personal experience with mental illness (Frequency percentage)		Family history of psychiatric disorder (Frequency percentage)		History of experiencing violence or serious personal problems (Frequency percentage)	
				Female	Male	Married	Single	Yes	No	Yes	No	Yes	No
Cardiology	33 (23.1%)	29.21 (2.65)	9.45 (2.47)	17 (51.5%)	16 (48.5%)	9 (27.3%)	24 (72.7%)	10 (30.3%)	23 (69.7%)	12 (36.4%)	21 (63.6%)	10 (30.3%)	23 (69.7%)
Psychiatric	31 (21.7%)	32.77 (5.34)	4.52 (2.50)	24 (77.4%)	7 (22.6%)	18 (58.1%)	13 (41.9%)	18 (58.1%)	13 (41.9%)	23 (74.2%)	8 (25.8%)	18 (58.1%)	13 (41.9%)
Internal medicine	30 (21%)	31.37 (4.65)	7.13 (3.68)	21 (70%)	9 (30%)	16 (53.3%)	14 (46.7%)	3 (10%)	27 (90%)	12 (40%)	18 (60%)	10 (33.3%)	20 (66.7%)
Surgery	25 (17.5%)	30.80 (4.34)	10.36 (2.44)	5 (20%)	20 (80%)	9 (36%)	16 (64%)	6 (24%)	19 (76%)	4 (16%)	21 (84%)	12 (48%)	13 (52%)
Neurology	24 (16.8%)	29.25 (2.069)	8.92 (3.02)	17 (70.8%)	7 (29.2%)	12 (50%)	12 (50%)	5 (20.8%)	19 (79.2%)	10 (41.7%)	14 (58.3%)	13 (54.2%)	11 (45.8%)
Total	143 (100%)	30.72 (4.22)	7.97 (3.51)	84 (58.7%)	59 (41.3%)	64 (44.8%)	79 (55.2%)	42 (29.4%)	101 (70.6%)	61 (42.7%)	82 (57.3%)	63 (44.1%)	80 (55.9%)

as different answering styles or sociocultural backgrounds. Cross-cultural differences, such as the importance of public opinion and conventional viewpoints, and religious environment, are significant and need further studies (26, 27).

The result of our study shows that psychiatric trainees have a less stigmatizing attitude toward patients with mental disorders compared to internal medicine and cardiology trainees. However, this finding was insignificant for surgery and neurology trainees.

Some specialties, such as cardiology and internal medicine, have higher workloads and burnout (28, 29). Increased workload and burnout may be associated with a more stigmatizing attitude toward mental health. This could be one reason for lower stigmatizing attitudes in psychiatric residents.

It is believed that patients with mental disorders are more frequently visited in cardiology and internal medicine clinics than in surgery (30–32). This finding is controversial with previous theories that more contact with patients with mental illness will reduce the stigma. One explanation could be that, in fields such as internal medicine and cardiology, the mental disorder of the patients is not systematically diagnosed and treated. As a result, patients remain unwell, and the unsatisfied doctor would keep the negative attitude that patients with mental illness can never get better and cannot have a normal life. Whereas in fields such as psychiatry, with proper treatment of patients, longitudinal assessment, and routine follow-ups, achievements are vividly seen. The response to treatment leads to recovery, balanced work, life, and a social environment. Thus, these exclusive preconditions may be the reason for the less stigmatizing attitude of psychiatric trainees (14, 15).

In other words, not every contact could help make a better attitude toward mental illness, but it needs preconditions.

When comparing the different stigma subscales, our study only shows that psychiatric trainees are less stigmatized toward social responsibility than other groups. Previous studies have shown that stigma toward social responsibility negatively affects empathy (20). An integrated relationship model has been proposed: physicians with a better experience, more excellent patient-to-physician contact, and more empathy toward them feel less uneasy with patients with mental disorders; thus, they tend to reduce their social distance from them (33).

Age, gender, marital status, and the number of shifts seem to have no meaningful relationship with stigma toward mental disorders. Our findings are consistent with previous and similar studies in Iran (34). Our results indicate that medical trainees with a personal history of medical illness have a less stigmatizing attitude toward patients with mental disorders. This finding is similar to

TABLE 2 Data descriptive: The mean total stigma score for mental illness among different medical residents and their comparison with one another.

Specialty	Mean ± SD	Mean difference (*P*-value) neurology	Mean difference (*P*-value) cardiology	Mean difference (*P*-value) psychiatry	Mean difference (*P*-value) surgery	Mean difference (*P*-value) internal medicine
Neurology	61.50 ± 4.56	–	−0.95455 (0.995)	3.11290 (0.083)	−0.06000 (1.000)	−1.46667 (0.977)
Cardiology	62.45 ± 3.80	0.95455 (0.995)	–	4.06745* **(0.000)**	0.89455 (0.997)	−0.51212 (1.000)
Psychiatry	58.38 ± 3.54	−3.11290 (0.083)	−4.06745* **(0.000)**	–	−3.17290 (0.078)	−4.57957* **(0.008)**
Surgery	61.56 ± 4.74	0.06000 (1.000)	−0.89455 (0.997)	3.17290 (0.078)	–	−1.40667 (0.984)
Internal medicine	62.96 ± 6.05	1.46667 (0.977)	0.51212 (1.000)	4.57957* **(0.008)**	1.40667 (0.984)	–

Asterisk and bold value represented the significant meaningful data.

TABLE 3 Comparison of OMS-HC subscales between different groups.

Subscales	Mean ± SD total score	Mean ± SD neurology	Mean ± SD cardioloy	Mean ± SD psychiatry	Mean ± SD surgery	Mean ± SD internal medicine	ANOVA between groups (*P*-value)
Social distance	16.38 ± 2.12	16.62 ± 1.99	16.27 ± 1.90	15.41 ± 1.89	16.68 ± 2.56	17.06 ± 2.06	0.33
Recovery	11.02 ± 1.91	10.87 ± 1.98	11.39 ± 1.47	11.41 ± 1.92	10.40 ± 2.10	10.83 ± 2.06	0.22
Social responsibility	14.46 ± 2.24	15.041 ± 2.62	15.09 ± 1.50	12.93 ± 2.01	14.64 ± 1.84	14.73 ± 2.51	**0.00**
Detection	13.56 ± 2.37	13.70 ± 2.21	13.72 ± 1.75	12.45 ± 2.20	13.60 ± 2.21	14.40 ± 3.03	0.27
Other concepts	5.93 ± 1.32	5.25 ± 0.89	5.96 ± 1.46	6.16 ± 1.06	6.24 ± 1.33	5.93 ± 1.55	0.68

The bold value represented the significant meaningful data.

previous studies (35, 36). Overall, it seems like personal contact has a protective factor toward manifesting less stigma toward mental disorders, such as those with personal experience, or psychiatrist trainees who work with patients with mental disorders daily. This finding is supported by similar previous results (37, 38). As discussed previously, contact does not seem to be enough. Perhaps, in these categorized groups, once they see the long-term effect of treatment on people closest to them, they feel less stigmatized toward them and people with mental illness.

Strengths and limitations

To the best of our knowledge, our study is among the very first studies in Iran on the attitude toward providing healthcare for patients with mental disorders. Iran University of Medical Sciences is one of the largest medical universities in Iran, and so the findings may be generalized to Iranian trainees. Nevertheless, the small sample size, particularly for between-group analyses, limits the interpretation of our findings. In addition, the lack of longitudinal study for observation of participants over time and using anti-stigma interventions is another limitation of our study.

Implications for practice, research, and policies

The development of anti-stigma programs can simultaneously target the attitudes of medical specialty trainees toward mental disorders, help-seeking, and their social behaviors toward patients with a mental disorder. These strategies can target different observations in this study. Different anti-stigma strategies, such as educational workshops, showing a movie about a patient with a mental disorder, close contact with patients with mental disorders, and group free discussion, were suggested by previous studies (4).

Future studies on larger sample sizes, among other specialties and universities, other health care community members, and qualitative methods are suggested, particularly in the medical staff with the most interaction with patients with mental disorders. In addition, the efficacy and effectiveness of anti-stigma strategies in well-designed trials among this group of healthcare providers should be evaluated in future trials.

Conclusion

The attitude of medical specialty trainees toward providing health care services for patients with mental illness is not uniform; internal medicine and cardiology residents have more stigmatizing attitude, while psychiatric residents have less stigmatizing attitude. It seems that not every contact could be useful in making a better attitude toward mental illness, but it needs preconditions, like a structured contact that leads to positive outcomes. Personal experience with mental illness also has a positive effect on the attitude. Anti-stigma interventions to improve the attitude of medical specialty trainees toward providing health care services for patients with mental illness should be considered.

Data availability statement

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

Ethics statement

The studies involving human participants were reviewed and approved by the Ethics Committee of Iran University of Medical Science. The patients/participants provided their written informed consent to participate in this study.

Author contributions

SM, SS, and MS: conceptualization and design. SM and MS: data collection and initial draft preparation. SM and SS: data analyses. All authors editing and review.

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Conflict of interest

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

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Internalized-stigma and dissociative experiences in bipolar disorder

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Introduction: Dissociative symptoms have been recently related to bipolar disorder (BD) symptomatology. Moreover, the disease burden carries on a share of perceived self-stigma that amplifies the BD impairment. Internalized stigma and dissociative symptoms often seem overlapping, leading toward common outcomes, with reduced treatment seeking and poor adherence. We hypothesize a potential relationship between dissociation and self-stigma in patients suffering from BD.

Materials and methods: In this cross-sectional study we enrolled a total of 120 adult clinically stable BD outpatients. All participants completed the Internalized Stigma of Mental Illness (ISMI), Dissociative Experiences Scale-II (DES-II), and Manchester Short Assessment of Quality of Life (MANSA).

Results: Average age and age at BD (BD-I $n = 66$, 55%; BD-II $n = 54$, 45%) onset were 46.14 (±4.23), and 27.45 (±10.35) years, with mean disease duration of 18.56 (±13.08) years. Most participants were female ($n = 71$; 59.2%) and 40 (33%) of them experienced lifetime abuse, with an average of 1.05 (±0.78) suicide attempts. DES scores (mean 31.8, ±21.6) correlated with ISMI total-score, with significant association with spikes in Alienation (13.1, SD±3.1) ($p < 0.001$) and Stereotype (13.8, SD±3.9) ($p < 0.001$). Linear regression analysis has shown a significant association between DES total score and alienation ($p < 0.001$), stereotype ($p < 0.001$) and MANSA total-score ($p < 0.001$).

Discussion: For the first time, our data suggests that self-stigma is associated to dissociative symptoms, reducing overall quality of life in BD. The early identification of at-risk patients with previous lifetime abuse and high perceived stigma could lead the way for an ever more precise tailoring of treatment management.

KEYWORDS

bipolar disorder, dissociation, internalized stigma, mental health, mood disorders, psychopathology, quality of life, trauma

Introduction

Bipolar disorder (BD) is a severe psychiatric disorder characterized by shifts of emotions, energy and thought, as well as changes in concentration and sleep need, with impairment in the ability to carry out day-to-day tasks, which mainly occur during biphasic mood episodes of mania or hypomania and depression, and are expressed as recurrent episodes of changes in energy levels and behavior, with a negative impact on patients' overall quality of life (1, 2).

The lifetime prevalence is around 1% worldwide, and, usually, the onset is in the late second or early third decade of life (1, 3). The chronic episodic course negatively affects several aspects of patients' life, including interpersonal relationships and occupational functioning, and can also lead to severe outcomes, including death by suicide (4, 5). Recently, dissociative symptoms have been related to BD symptomatology and phenotype characterization suggesting a role in the etiology and clinical course of the disease, thus representing a new area of study both for research and for the clinic, with the aim of a more precise tailoring of patients' treatment management (6).

Frequently, not recognizing the mood shift and poor insight can delay treatment initiation and a worsening of the clinical course (7, 8). Indeed, these two aspects of BD could be due to a considerable heterogeneity of clinical presentation and the patients' fear of being stigmatized in case of seeking help (9). However, both reduced treatment-seeking and the worst clinical course can lead to a severe outcome and frequently are associated with social withdrawal, functional impairment and alienation (4, 5). Consequentially, stigma is a critical issue in BD because it leads to poor treatment adherence and more severe symptomatology (10). This is an important concern because the chronic mood shift could represent a risk factor for psychosis, traumatic events, and cognitive impairment, and all those aspects were correlated to dissociative symptomatology (11, 12).

Moreover, several studies highlight that patients suffering from affective disorders present dissociation as a preferred coping strategy (13, 14), and dissociative experience disrupts wholeness in the stream of mind. Dissociation also prevents the integration of experiences and information and leads to amnesia, depersonalization, and derealization (15, 16). Additionally, internalized stigma and dissociative symptoms seem to overlap, sharing features such as alienation, isolation, functional impairment and disease burden, often leading to common outcomes with reduced treatment-seeking and poor adherence (17).

In recent years, some advances have been made regarding the knowledge concerning stigma in BD, and, according to our current understanding, there are mainly three kinds of stigma. The most well-studied concept is the internalized or self-stigma, which explains the subjective appreciation of negative experiences and perceptions of the patients themselves, leading to identity transformation and stereotype endorsement (18). The second entity is perceived stigma, namely the patients' subjective experience of being stigmatized by other agencies (19, 20). This is mostly contributed by endorsing various discriminatory traits deep-rooted in the disease process. Structural or systemic stigma is the third and probably a minor studied entity. It refers to institutional policies and practices surrounding a person that creates inequality by restricting opportunities for people suffering from mental illness (21, 22). Stigma also involves perceiving patients with BD with a negative outlook and attributing stereotypes, thus further leading to interference in community participation. However, the debate on developing effective interventions to fight stigma related to BD or other general medical and psychiatric diseases is still ongoing (23).

We hypothesize a potential relationship between internalized stigma and dissociative phenomena in patients affected by BD, potentially leading to a peculiar negative clinical course and a worsening quality of life. Therefore, the present work aimed to assess the correlation between self-stigma, dissociative symptoms, and quality of life in a clinical sample of patients suffering from BD with a cross-sectional study design, and to test if the dissociative symptomatology may be related to a specific subthreshold of internalized stigma and/or to quality of life.

Materials and methods

Participants and procedures

This study was designed as a naturalistic and uncontrolled cross-sectional observational study at the outpatients' Psychiatry unit of the University Hospital Mater Domini of Catanzaro (Italy) and was conducted between May 2020 and January 2022. All consecutive potentially candidate patients were screened for eligibility and invited to participate in the study, where applicable. Participants were screened and diagnosed by a clinical interview conducted by experienced clinicians through the Structured Clinical Interview for DSM-5 (SCID-5 CV) (24). The interviewers were experienced psychiatrists who work in clinical research, were trained in administering neuropsychiatric tools, and used these tests in their daily clinical practice.

We included all patients fulfilling the following inclusion criteria: (1) aged between 18 and 70 years and able to read and understand the informed consent form; (2) capability to answer self-report questionnaires; (3) diagnosed with BD type-I (BD-I) or type-II (BD-II) according to the Diagnostic and Statistical Manual of Mental Disorders-fifth edition (DSM-5) (24); (4) clinically stable, if at the time of enrollment the Clinical Global Impression for Bipolar Patients (CGI-BP) (25) scored $\leq$2 at item 1 (severity of illness). We did not set any other inclusion criteria, with the goal to achieve a real-world clinical

sample, as routinely visited in daily clinical activity. Regarding exclusion criteria, we excluded patients if: (1) with recent (≤6 months) or uncertain BD diagnosis or with a medical history that was implausible or undocumented; (2) with comorbid psychiatric diagnosis (i.e., schizophrenia spectrum disorders, major depressive disorder, post-traumatic stress disorder); (3) affected by dementia or intellectual disability from mild to severe according to DSM-5 (corresponding to IQ < 70); (4) with alcohol or drug abuse in the previous 6 months and dependence for 12 months according to DSM-5 diagnostic criteria; (5) suffering from another severe medical condition related with psychiatric symptoms (e.g., temporal lobe epilepsy, multiple sclerosis, brain trauma, malignant disease).

According to the Ethical Committee, participants were provided with a complete description of the study aims and methods and gave written informed consent to participate in the study before any procedure took place. The study protocol was submitted and approved by the Ethical Committee of University Hospital Mater Domini at Catanzaro (n. 307/2020), and the study procedures were carried out in accordance with the ethical principles set out in the revised version of the Helsinki Declaration (26).

Assessments

We collected patients' demographics and clinical (i.e., psychopharmacological therapy) information through an *ad hoc* schedule. In detail, we used a semi-structured interview collecting data on age, sex, civil status, years of education, current occupation, family history of psychiatric diseases, psychiatric and general medical comorbidity, onset, and longitudinal course of the disorder (e.g., number of depressive/hypo/manic episodes, mixed and anxious features, and psychotic symptoms), number of previous suicidal attempts and psychiatric hospitalizations, and current prescribed treatments.

Then, all participants were evaluated by means of the following Italian versions of assessment scales:

- The Clinical Global Impression for Bipolar Patients (CGI-BP) (25) is a modified version of the original CGI specifically developed to assess global illness severity and change in patients affected by bipolar disorder, and already used with Italian clinical samples (27). It is divided into two sections, severity of illness and global improvement, and both range between a minimum of one ("normal, not ill at all") to a maximum of seven ("among the most extremely ill patients"), while 0 denotes the impossibility to assess the score.
- The Internalized Stigma of Mental Illness (ISMI) scale (28) is a 29-item self-administrated questionnaire measuring self-stigma in the population suffering from mental disorders. It has been structured to quantity the subjective experience of stigma, with subscales measuring Alienation (six items), Stereotype Endorsement (seven items), Perceived Discrimination (five items), Social Withdrawal (six items) and Stigma Resistance (five items) through 29 Likert questions with four reply options, ranging between strongly disagree (one point) and strongly agree (four points), with a total score between 29 and 116 (28). It is a widely used and validated tool whose psychometric proprieties have been comprehensively evaluated across multiple versions, cultures, and languages, including Italy (18, 29), as well as several major psychiatric disorders (e.g., depression, schizophrenia, substance abuse, eating disorders) and general medical illnesses (e.g., epilepsy, inflammatory bowel disease, leprosy) (20). It should be considered that the five stigma resistance subscale items are reverse-coded, and also serve as a validity check (28). Therefore, stigma resistance displays the same direction of correlation as the other four subscales. A high total score on the ISMI scale indicates more severe internalized stigmatization (30).
- The Dissociative Experiences Scale II (DES-II) (31), and its Italian version (32), is a largely used self-assessment measure developed to offer a feasible tool of reliably quantifying dissociative symptoms in both general and clinical populations. The scale is made up of 28 items describing dissociation features (i.e., absorption, amnesia, depersonalization, and derealization), and the user is asked to select a percentage defining how much the patient experienced the symptom, ranging from 0 (never) to 100% (always). The final score comes from the sum of all items divided by the number of total items (i.e., 28), ranging between 0 and 100. The dissociative disorder cut-off is settled with scores >30.
- The Manchester Short Assessment of Quality of Life (MANSA) has been developed as a brief, handy and innovative instrument for assessing the quality of life, focusing on satisfaction with life as a whole and with life domains (33). It includes 16 questions, four of them investigating the objective quality of life and rated by a dichotomized yes/no scale, and 12 rated on a 7-point scale and exploring satisfaction with life, job, financial situation, friendships, leisure activities, accommodation, personal safety, people that the person lives with, family and global health. Its maximum total score is 93 points. Finally, an overall subjective quality of life score may be calculated (34). The MANSA scale showed good reliability, construct validity, and internal consistency when investigating quality of the life in people affected by severe general medical and psychiatric conditions, including Italian samples (34, 35).

Statistical analyses

Descriptive statistics were calculated for socio-demographic and clinical characteristics and other relevant assessment instruments. As appropriate, data are presented as means and standard deviations (SD) or frequencies and percentages (%). A Spearman's correlation analysis was performed to test

the correlation between psychometric scale and clinical and sociodemographic variables. A linear regression model was used to describes the relationship between the DES total score as dependent variable, and ISMI subscales and MANSA total score as independent variables. Odds ratios (OR) with 95% confidence intervals were assessed for observed associations. All tolerance values in the regression analyses were >0.1 and all variance inflation factors were <10, expressing that the assumption of multicollinearity was not violated. The level of statistical significance was set at a nominal value of $p \leq 0.05$. Statistical analyses were performed by using the Statistical Package for Social Sciences Version 26 (SPSS, Chicago, Illinois, USA).

Results

We approached a total of 138 consecutive patients fulfilling the inclusion and exclusion criteria. Of these, a total of 18 did not participate in the study due to the following reasons: refusal to complete the assessment ($n = 10$) or to sign the informed consent ($n = 6$), or other reasons ($n = 2$). Therefore, the final sample was made up of 120 patients, of whom 66 (55%) suffering from BD-I and 54 (45%) from BD-II. The average age (± standard deviation, SD) was 46.1 (±14.23) years, and the majority of participants were female ($n = 71$; 59.2%), single ($n = 56$; 46.7%), graduated ($n = 93$; 73.5%), employed ($n = 70$; 58.3%), with positive family history for both psychiatric ($n = 82$; 68.3%) and general medical ($n = 69$; 57.5%) disease, and 33.3% ($n = 40$) of them experienced lifetime abuse (Table 1).

Regarding clinical features, the average age (± standard deviation, SD) at BD onset was 27.45 (±10.35), while the average disease duration was 18.56 (±13.08) years. We recorded a mean of 5.43 (±5.10) depressive, 3.92 (±2.90) maniac, and 3.11 (±3.06) hypomanic episodes, then the average number of affective episodes was 10.47 (±9.91) among patients. Most included patients presented aggressive behaviors ($n = 70$; 58.3%) and anxious features ($n = 79$; 65.8%), with also frequent mixed ($n = 59$; 49.2%) and psychotic ($n = 53$; 44.2%) symptoms. Seasonality was also very common ($n = 56$; 46.7%), as well as suicidality ($n = 39$; 32.5%), with an average of 1.05 (±0.78) suicide attempts (Table 2).

The DES mean (± standard deviation, SD) score was higher than the settled cut-off of 30 points (i.e., 31.8 (±21.6), with spikes shown especially in Alienation (13.1, ±3.1), Stereotype (13.8, ±3.9) and Social distancing (13.0, ±2.7) items. As for the MANSA scale, participants scored an average total of 49.1 (±10.9) out of 93 total points, while ISMI mean score was 60.4 (±9.6) out of a tool range between 29 and 116 (Table 3).

Table 4 includes the results of Spearman's correlations between DES-II total score, ISMI-specific subdomains, ISMI total score and MANSA total score and clinical features (i.e., number of total episodes, hospitalization, psychotic features, and previous substance abuse). Several significant correlations emerged for almost all variables, particularly between DES total score, ISMI subdomains and ISMI total score.

TABLE 1 Demographics and personal characteristics of the sample.

		Total Sample $N = 120$	
Age[a]		46.14	(14.23)
Gender[b]	Men	49	(40.8)
	Women	71	(59.2)
Education (years)[a]		13.45	(3.37)
Graduated[b]	Yes	93	(73.5)
Civil status[b]	Single	56	(46.7)
	Married	44	(36.7)
	Divorced	16	(13.3)
	Widow	4	(2.5)
Occupation[b]	Employed	70	(58.3)
	Unemployed	33	(27.5)
	Students	17	(14.2)
Diagnosis[b]	Bipolar disorder type I	66	(55.0)
	Bipolar disorder type II	54	(45.0)
Family history of psychiatric disorders[b]	Positive	82	(68.3)
Family history of general medical diseases[b]	Positive	69	(57.5)
Lifetime abuse[b]	Yes	40	(33.3)

[a] Data are presented as means (SD).
[b] Data are presented as frequencies (%).

A linear regression with DES total score as dependent variable was performed to assess the association between dissociative symptomatology and ISMI total score, ISMI subdomains, and MANSA. A significant association was found between Alienation (B = 0.279; $t = 4.329$; $p < 0.001$), Stereotype (B = 0.331; $t = 4.555$; $p < 0.001$) and MANSA total score (B = −0.320; $t = -5.909$; $p < 0.001$) (Table 5).

Discussion

This study found a strong relationship between internalized stigma and dissociative phenomena in patients suffering from BD, which may lead to a peculiar negative clinical course and a worsening quality of life. To the best of our knowledge, this is the first time internalized stigma was explored concerning its role in dissociation symptoms in BD, with consequences on quality of life. Further, as shown by Spearman's correlation analysis, internalized stigma is correlated to several clinical variables predictive of poor clinical outcomes in BD. ISMI total score correlates to a higher number of total episodes,

TABLE 2 Clinical features of the sample.

	Total Sample $N = 120$	
Age of BD onset (years)[a]	27.45	(10.35)
Age first psychiatric contact (years)[a]	30.16	(10.57)
Age of first admission (years)[a]	29.86	(9.4)
Age of first hypomanic episode (years)[a]	31.47	(10.34)
Age of first depressive episode (years)[a]	27.76	(10.43)
Age of first manic episode (years)[a]	28.50	(7.70)
Duration of the disease (years)[a]	18.56	(13.08)
Duration of hospitalization (days)[a]	9.93	(5.93)
Number of depressive episodes[a]	5.43	(5.10)
Number of manic episodes[a]	3.92	(2.90)
Number of hypomanic episodes[a]	3.11	(3.06)
Lifetime number of affective episodes[a]	10.47	(9.91)
Number of affective episodes in the last year[a]	0.78	(0.78)
Number of suicide attempts[a]	1.05	(0.78)
Seasonality[b]	56	46.7
Suicidality (positive)[b]	39	32.5
Aggressive behaviors (positive)[b]	70	58.3
Mixed features (positive)[b]	59	49.2
Anxious features (positive)[b]	79	65.8
Psychotic symptoms (positive)[b]	53	44.2

[a] Data are presented as means (SD).
[b] Data are presented as frequencies (%).

TABLE 3 Assessment evaluation.

	Total Sample $N = 120$	
DES total score	31.75	(21.61)
ISMI total score	60.40	(9.62)
Alienation	13.07	(3.06)
Stereotype	13.83	(3.92)
Discrimination	9.86	(2.17)
Social withdrawal	12.99	(2.74)
Stigma resistance	8.21	(1.25)
MANSA total score	49.14	(10.94)

All values are reports as mean (± standard deviation).

hospitalization, psychotic features, and previous substance abuse, highlighting its impact on those factors predictive of a higher psychopathological burden. Such results are easily explained due to the impact of stigma on the life of psychiatric patients, especially those suffering from BD (36, 37). A growing body of literature focused on the sociodemographic and clinical variables correlated to the stigma, and our results are in line with them except for the age of onset, which was poorly investigated before (38, 39). Stigma has a significant impact on

TABLE 4 Results of Spearman correlation analysis.

	DES total score	Alienation	Stereotype	Discrimination	Social withdrawal	Stigma resistance	ISMI total score	MANSA total score	n. of total episodes	Hospitalization (*n*)	Psychotic features	Previous substance abuse
DES total score	–	–	–	–	–	–	–	–	–	–	–	–
Alienation	**0.865****	–	–	–	–	–	–	–	–	–	–	–
Stereotype	**0.901****	**0.844****	–	–	–	–	–	–	–	–	–	–
Discrimination	**0.632****	**0.615****	**0.687****	–	–	–	–	–	–	–	–	–
Social withdrawal	**0.626****	**0.675****	**0.649****	**0.671****	–	–	–	–	–	–	–	–
Stigma resistance	**−0.183***	−0.101	−0.175	**−0.199***	−0.103	–	–	–	–	–	–	–
ISMI total score	**0.811****	**0.895****	**0.879****	**0.778****	**0.834****	−0.012	–	–	–	–	–	–
MANSA total score	**−0.851****	**−0.743****	**−0.801****	**−0.531****	**−0.573****	0.139	**−0.718****	–	–	–	–	–
n. of total episodes	**0.540****	**0.482****	**0.508****	**0.325****	**0.361****	−0.141	**0.460****	−0.403**	–	–	–	–
Hospitalization (*n.*)	**0.616****	**0.515****	**0.514****	**0.486****	**0.537****	−0.188*	**0.539****	−0.570**	0.497**	–	–	–
Psychotic features	**0.774****	**0.712****	**0.719****	**0.576****	**0.662****	−0.246**	**0.701****	−0.741**	0.530**	0.784**	–	–
Previous substance abuse	**0.416****	**0.452****	**0.401****	**0.243****	**0.336****	−0.035	**0.379****	−0.419**	0.251**	0.543**	0.419**	–

*$p < 0.05$; **$p < 0.01$. Significant results are in bold.

TABLE 5 Results of linear regression.

Independent variable	Dependent variable	Not Standardized coefficients		Standardized coefficients		
		B	Standard error	B	*t*	*p*
Alienation	DES total score	1.969	0.455	0.279	4.329	**<0.001**
Stereotype endorsement	DES total score	1.822	0.400	0.331	4.555	**<0.001**
Perceived discrimination	DES total score	0.756	0.474	0.076	1.595	0.113
Social withdrawal	DES total score	0.119	0.391	0.015	0.306	0.760
Stigma resistance	DES total score	−1.849	0.565	−0.107	−3.274	**<0.001**
MANSA total score	DES total score	−0.633	0.107	−0.320	−5.909	**<0.001**

Significant results are in bold.

people with BD, linked to negative stereotypes, prejudice and discrimination (8).

Usually, one of the most explored findings resulting from studies using ISMI is the relationship between internalized stigma and more severe psychopathology, lower self-esteem, reduced treatment adherence, and greater symptom severity (40–42). Pilot studies exploring ways to reduce internalized stigma are promising and warrant further investigation (20). In addition, a negative correlation is reported with the perceived quality of life. Initial studies on ways to reduce internalized stigma are promising but need further investigation (43, 44). Research has focused on the relationship between internalized stigma and self-esteem and how this implies negative evaluations (45, 46). An issue underlying this hypothesis is the influence that different processes have on self-esteem: one of the most critical concerns is the response of others. Many authors suggest that patients affected by mental illness tend to have dissociative symptoms that lead to alienation, discrimination, and negative representation even before being diagnosed. Due to this, several negative consequences occur, including the tendency to social isolation and a reduction in interpersonal relationships. This maladaptive schema worsens the patient's quality of life (47, 48). To date, little research has focused on the phenomenon of internalized stigma and the negative aspects related to it. The results obtained in the present study confirm our hypothesis, according to which there is a direct effect between dissociation and internalized stigma, particularly in the alienation and stereotype fields. Alienation is widespread among patients with bipolar disorder, especially those with higher psychopathological burdens, and refers to a sense of self-estrangement and poor social connection (49). The phenomenon of alienation represents an essential indicator of mental well-being and is often associated with depressed mood, dissociative symptoms, and psychological distress, even in other severe psychiatric disorders (50). According to our results, patients with a high level of dissociative symptoms and low self-esteem attribute a high level of stigma to themselves.

Further, previous research indicates alienation as a maladaptive coping strategy in psychiatric patients facing traumatic experiences (51, 52). This field might explain the strong connection resulting in the linear regression between alienation and dissociation. Moreover, a significant association was found between dissociation and stereotype. These results support the hypothesis that mental illness stereotypes still may represent a cultural barrier. Indeed, patients affected by chronic severe psychiatric disorders could experience social stigma feeling it as a trauma, thus rising maladaptive coping strategies, including dissociation (53).

Consequently, both self-stigma and dissociative symptoms represent two elements of greater severity of BD that potentially worsen its clinical outcome lowering treatment adherence and deteriorating the prognosis (54, 55). Previous research has focused on the difference in internalized stigma in different cohorts of psychiatric patients, highlighting the major level of internalized stigma in bipolar disorder rather than non-affective psychotic disorders (56, 57). Another expected result in line with the literature is the negative relationship between internalized stigma and quality of life. Several studies have been conducted on this topic. The explanation is that internalized stigma is associated with adverse psychological outcomes such as depressive symptoms, lower self-esteem and reduced self-efficacy, which a poorer outcome will reflect on the psychological domain (58–60).

Moreover, results presented in our study should be interpreted in the light of both some limitations and strengths. Indeed, although the clinical sample involved was recruited in a naturalistic setting, adequate to describe the general population and similar to several analogous studies (8, 61, 62), the inconspicuous final sample size as well as the lack of hypothesis-driven sample size estimation and the absence of confounders addressed in the linear regression model represent the main study limitations which preclude drawing causal conclusions; therefore, we foresee the implementation of the sample size together with a prospective study design to confirm the results obtained. Secondly, the cross-sectional design using self-administered evaluations represents a structural limitation regarding the assembly and reliability of the data, which must be considered in any generalization of the results. Finally, the

enrolled patients were clinically stabilized as inclusion criteria, so a mirror evaluation in patients with acute BD may result differently. Hence, the need to replicate similar protocols on larger samples with perspectives capable of acquiring designs at different stages of the disease. On the other hand, this was the first attempt to evaluate the role and implications of internal stigma in BD, taking into account its relationships to demographics, history of the disease, clinical features, quality of life, and dissociative symptoms. Thus, the results presented in this study open a new perspective on the role that self-stigma and dissociative symptoms play in BD. Indeed, future studies could shed the light on the causal and temporal relationship existing between internalized-stigma and dissociation, opening new and interesting frontiers in both clinical and research fields.

Conclusion

Recently, dissociative symptoms have been studied concerning their impact on BD clinical course and treatment response, while perceived stigma is already well-known to interfere with clinical outcomes. However, the relationship between dissociative symptoms, self-stigma and quality of life in patients suffering from BD is still far from being fully understood and has been explored in this study.

Although burdened by several limitations and by a cross-sectional study design which avoids a generalization, our findings correlate self-stigma reported by patients affected by BD to experienced dissociative symptoms, resulting in a reduced overall quality of life. Therefore, the study of this network may represent an area of clinical research interest for the future, with the goal of reaching a more patients' focused clinical practice to anticipate a precise diagnosis, manage personalized treatment, and improve prognosis.

Data availability statement

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

Ethics statement

The studies involving human participants were reviewed and approved by Ethical Committee of University Hospital Mater Domini at Catanzaro (Italy) (n. 307/2020), and the study procedures were carried out in accordance to the ethical principles set out in the revised version of the Helsinki Declaration. The patients/participants provided their written informed consent to participate in this study.

Author contributions

LS: conceptualization and formal analysis. RdF and LS: methodology and writing the original draft preparation. RdF, MD'A, and LS: investigation and data curation. RdF, GM, EC, AT, PD, and LS: writing and review and editing. All authors read and approved the final manuscript.

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Conflict of interest

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

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"Be my Voice" to break social stigma against domestic violence: The underestimated role of smartphone applications in protecting victims in developing countries

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Introduction

Domestic violence (DV), which can be described as a pattern of assaultive and coercive behaviors, including physical, sexual, and psychological abuse committed within an intimate relationship, is a major global concern (1). DV-associated stigma can multiply the risk by preventing victims from help-seeking. Therefore, preventive measures should be taken in different stages. Here, after pointing out the significance of DV and its related stigma as a global social problem and briefly reviewing the available smartphone preventive solutions, we will shortly introduce "Be my Voice" as the first faculty-based Iranian app targeting DV victims.

DV can affect all genders and age groups, mostly women, children, the elderly, and other vulnerable individuals (2). It is estimated that overall, one in every three women experiences violence, physically and/or sexually, at some point in their lives (3). Studies have shown a higher prevalence of DV among women in Iran (66%) (4). This difference in prevalence may be rooted in social, economic, and cultural differences (5, 6).

DV can affect the victims not only physically but also mentally. These mental impacts can be severe and long-lasting. Post-traumatic stress disorder, depression, anxiety, substance use, and suicidal behaviors are examples of psychological problems caused by exposure to violence (7–9).

The COVID-19 pandemic has added even more complexity to this issue. Different studies have shown an increase in DV during COVID-19 confinement and lockdown periods (10–12). On the other hand, isolation at home has deprived many victims of telephone helplines, services, finance, informal social supports, or safe shelter, making the situation harder for the victims (10–12).

One of the problems facing this global issue is that we can only see a small proportion of DV while a significant amount of it remains unreported. Feeling ashamed and fear of being alienated by the society alongside unawareness, financial barriers, cultural beliefs, not feeling secure, and the threat of losing children and support leads to this under-reporting (13). Despite the high prevalence of DV throughout history, DV victims still experience high levels of stigma from different sources. Stigma is made of labeling, stereotyping, and separation that can cause status loss and discrimination. Different types of stigma faced by victims might include internalized stigma, anticipated stigma, enacted stigma, cultural stigma, and perpetrator stigma (14). Stigma in DV victims could cause negative feelings and shame due to isolation and loss of social status, therefore plays an important role in reducing help-seeking behavior (14).

Speaking of prevention, like other psychosocial issues, one must take four stages into consideration; primordial, primary, secondary, and tertiary prevention. Primordial prevention aims at risk factor reduction and typically gets promoted through laws and national policy (15). Primary prevention focuses on stopping conditions that support DV and encouraging conditions that inhibit DV. These measures might include promoting positive behaviors and skills to prevent DV through antiviolence campaigns, empowerment programs, and safety plan development (16, 17). Screening programs and referrals to legal services are examples of measures in the secondary prevention stage (17, 18). Long-term responses occurring after DV to deal with the lasting consequences of violence and offender treatment interventions are parts of tertiary prevention. Measures in this stage include providing mental and physical health interventions, safe-houses, and legal advocacies (17, 18). When measures are taken in all four stages together, they create a comprehensive response to DV.

The role of smartphone apps in the prevention of domestic violence and related stigma

It is estimated that more than 6 billion people in the world own smartphones (19). The rapid advances in digital technologies and the worldwide dominance of smartphones and applications have created a great opportunity for delivering mental health services and interventions on a global scale (20). In recent years, especially during the COVID-19 pandemic, the role of technology-based interventions, including smartphones and applications, has become more prominent (21). Today more than 2.6 million apps for Android operating smartphones and more than 2.2 million apps for iOS devices are available (22). More than 40,000 of these applications are health-related (23). By only searching "domestic violence" in the Apple store, you can find more than 50 related apps. Table 1 shows a number of DV-related applications available in stores and their features. We searched the applications reviewed in two recent review studies in the Google play store and Apple store (24, 25). We then included the applications which were downloadable in any of the above stores in this table. At last, "Toranj," the only DV-related application for Iranian women that we could find, was also added.

In a recent study conducted by Moret et al. aimed to evaluate the prevalence and quality of free smartphone apps related to intimate partner violence and sexual violence prevention and response, 132 apps were evaluated and scored. Applications were categorized into eight groups based on intervention strategies: information/education, safety monitoring/tracking, goal setting/safety planning, location tracking, decision making, feedback, assessment, and others. The primary strategy of the majority of apps was information sharing and education, followed by safety monitoring and safety planning. The study stated that the included apps were of low to moderate quality (22).

In an article published in 2019, Laura Brignone and Jeffrey L. Edleson reviewed the smartphone applications related to the prevention of dating and DV. Thirty-eight applications were evaluated and rated based on a 27-point scale created by the author, assessing their performance as apps and as interventions for dating and DV. The ratings showed that four apps had low-quality, 17 had medium-quality, and 15 were classified as high-quality. This study also pointed out limitations of visibility and utility to prospective users. It was also suggested that applications developed by individuals with no connection to advocacy services or evidence-based practice could cause harm (24).

Probably one of the most reviewed applications related to DV is myPlan. This interactive decision aid and safety planning intervention app aims to assist feminine college students who have been violated in different ways. It also helps them by educating their family members and friends. This application allows the users to evaluate their relationships, consider their priorities, and develop a customized alternative plan. This app also offers the opportunity to connect directly to advocacy and mental health services (26, 27). A study showed that the use of myPlan significantly reduced users' experience of reproductive coercion and the risk of suicide compared to the control group, using usual safety planning. This study also showed a decrease in intimate partner violence over time in the myPlan group compared to controls (28).

HearMe is another application that aims to mitigate women's harassment. This app enables a tap-based emergency contact by

TABLE 1 Reviewing a number of DV-related applications and their features*.

Applications name	Link	Country	Features
Circle of 6	https://www.circleof6app.com/	USA	Sending a text message and GPS location to trusted friends. Direct access to information about sexuality, relationships, and safety. Direct access to national hotlines
Daisy	https://www.1800respect.org.au/daisy	Australia	Connecting people experiencing violence or abuse to supportive services in their local area. Safety features to help protect the privacy of people using it
myPlan	https://www.myplanapp.org/	USA	Safety planning and decision aid. Information about violence. Danger assessment tool
Bright Sky	https://www.hestia.org/brightsky	UK, available in 5 languages: English, Urdu, Punjabi, Polish, and Welsh	Providing information on support services. Risk assessment. Resources and information on domestic violence and abuse
Youth Pages	https://www.youthpagestoledo.org/	USA	Providing information about violence and available resources
RUSafe	https://wcspittsburgh.org/partner-violence/rusafe-app/	USA	Risk assessment. Connecting the user to domestic violence hotlines
Aspire News	https://www.whengeorgiasmiled.org/aspire-news-app/	USA	Sending messages or calling for help in crisis at the touch of a button. Resources for victims of domestic violence
Domestic Violence Prevention	https://www.applocker.navy.mil/#!/apps/29ACFD8A-D850-4BC4-AC0A-80E5898BE903	USA	Information about domestic violence and different ways to report it. Emergency contact to the hotlines
Positive Pathways	https://positivepathways.org.au/services/safety-and-wellbeing-app/	Australia	Voice recording features in crisis. Sending messages and GPS location to trusted friends. Connecting to the emergency services. Resources for victims of domestic violence
Gwen Alert	https://gwen.global/gwen-alert/	USA	Sending messages and GPS location to trusted friends
Toranj	https://www.toranjapp.com/en	developed in the USA for Iranian women	Providing emergency contact, legal and educational resources, free counseling centers, and relationship assessment
bSafe	https://www.getbsafe.com	USA	Sending GPS location, audio, and video to guardians. Voice and video recording. Producing fake calls

*DV-related applications reviewed in two recent studies (24, 25), which were downloadable in Google play store and/or Apple store, were included in this table. Also, "Toranj," the only DV-related application for Iranian women to our knowledge, was added to the table.

sending a short message/phone call and generating an alarm sound in the destination device. It also provides information about nearby hospitals, police stations, and law assistance centers. Other features include audio recording, spy camera, and GPS location sharing (29).

SAP_MobAPP (sexual abuse prevention mobile application) is another application developed to educate primary school children in Korea about sexual abuse prevention. This app aims to educate the children to recognize child sexual abuse and empower them to prevent and protect themselves in such situations. This application provides users with animated scenarios and asks the user true/false questions. Evidence showed long-lasting improved awareness and skills to avoid child sexual abuse situations in children who used this application compared to the control group (30).

An interesting study in 2016 reviewed the responses of smartphone-based voice assistants to questions about mental health, interpersonal violence, and physical health. This study showed that only one out of four voice assistants reviewed recognized "I was raped" serious and connected the user to the hotlines. None of the four reviewed voice assistants recognized "I am being abused" or "I was beaten by my husband" as concerning statements (31). This problem seems to be resolved by the developers, and today all the three statements above are considered serious, and the user becomes connected to DV hotlines.

As mentioned earlier, victims of DV are prone to long-lasting psychological problems like depression and anxiety. Access limitations to mental health care and the shortage of mental health care staff in addition to the stigma toward medications

and psychotherapies have limited their effectiveness (32–35). Smartphone-based interventions seem to be a promising alternative solution. A meta-analysis conducted by Firth et al. showed that smartphone apps had a significant effect on reducing depression symptoms compared to control groups (20). Another study showed that mobile apps for depression, besides their easy availability, have notable effects on patients suffering from moderate degrees of depression (36). It is reported that smartphone-based mental health interventions have the potential to be effective in generalized anxiety disorder (37, 38).

As discussed, technology-based interventions can be a promising solution to fight DV. Still it is also important to point out the role of technology as a tool for abuse. A study published in 2016 showed that offenders could abuse mobile technologies to stalk and harass women in the context of DV (39). Technologies like text messages, phone calls, GPS tracking, and social media enable the perpetrators to access and control the victims all day. Social media empowers offenders to abuse and humiliate victims, especially in sexualized ways (39). Another review study stated that ∼50% of college students were either victims or perpetrators using communications technology in the context of an intimate partner relationship. It also stated that the development of digital technologies combined with intimate knowledge of the victim, permits the offender easy access to personal information alongside effortless abusive communication with the victims (40).

Taking all into account, technology-based interventions including smartphone applications play a dichotomous role in DV. Still, having in mind the abusive aspects of technology, we strongly believe that they are of great potential in combat against DV if used securely.

"Be my Voice": A tiny smartphone app aimed to prevent domestic violence, educate and support the victims

As mentioned earlier, the prevalence of DV has increased during the COVID-19 lockdown. On the other hand, the confinements have limited access to helplines and supporting facilities (10–12). Iran is no exception, and it seems that the prevalence and severity of DV in Iran have also increased, to the extent that three of the honor kills that happened in Iran during the first year of the lockdown were so drastic that went viral in the press for a long time (41–43).

In earlier paragraphs, we discussed the promising role of smartphone applications in raising awareness, fighting against DV, and providing support and help for victims. Traditions, beliefs, supporting systems, and even laws are deeply affected by sociocultural issues. Therefore, in order to make these applications efficient, they must be customized and culturally tailored for different countries. Considering the promising role of smartphone applications and also the lack of suitable and culturally tailored applications for Iranian victims, we decided to develop a smartphone app, named "Be my Voice" in Iran, a developing country with a high prevalence of DV and lack of supporting systems and NGOs (4). To our knowledge, this application is the first faculty-based DV app developed in Iran. This application is designed by medical students and psychiatry residents under the supervision of psychiatry professors at Mashhad university of medical science. This application offers the Iranian victims the chance to freely access information, plans, and supports compatible with local cultures and laws to fight the stigma surrounding DV.

In order to design the app, we studied the legal pathways from which Iranian victims of DV may benefit. We also tried to create a list of different kinds of support and violence prevention instructions in distinct settings. Finally, after an extensive review of the literature and similar applications and adjusting our findings to local facilities and requirements, we wireframed the pre-designed mobile software. We then used the VueJs framework to develop a demo web application. Figure 1 shows different stages in developing Be my Voice application.

Reviewing the similar applications and adapting their useful features, we developed this bilingual easy-to-use app with multidimensional services for DV victims. A simple in-app questionnaire is provided to help victims discover their situation and whether they are victims of DV. This app also offers victims legal ways to claim their rights. Educatory materials on human rights, different types of DV, and supporting laws are provided in different categories for children and adults. This app also offers the victims the chance to make supporting networks and plans to leave home. In urgent situations, this app can connect the user to police, social emergency services, and pre-defined supporting persons. It also has the potential to provide a bridge between victims and supporting NGOs, which are highly lacking in Iran.

In order to provide security and privacy for the app users, we designed the application in a way that name and icon of the application and also the "help message" can be customized to keep it hidden and safe. The application is protected *via* a password and offers the user the chance to use it unidentified. It is also important to note that the user's information is kept on the servers anonymously.

Although the application is not yet fully developed and not in its final form we have made an online demo (accessible from: https://bemyvoice.netlify.app/) ready for hands-on in order to adjust and debug the application according to the experts' opinions before the first pilot study. It is also worth mentioning that in its first public presentation at the 38th annual congress of the Iranian psychiatric association, this app was selected for the 6th

FIGURE 1
Different stages of developing Be my Voice application.

yearly Davidian Award for young psychiatrists[1]. The evidence provided by such apps can offer help and support for the government and in charge authorities to create efficient hotlines and supporting services. We are also planning to grab support from social charities and NGOs to provide clinical and legal services, especially for the victims with lower socioeconomic conditions.

Conclusion

As discussed above, in order to prevent and manage the DV, measures must be taken in all four prevention stages. Technology-based interventions such as smartphone applications have the potential to provide free, available, and effective solutions in all those prevention stages. Excellent accessibility, affordability, availability, and anonymity are factors that make smartphone applications a promising solution for the prevention of DV and intimate partner violence. Especially in developing and underdeveloped countries, where the rate of DV is relatively higher (44), many people are unaware of their rights, and access to health care providers is limited.

The majority of the apps available in the Apple store and Google play store are in English and based in and customized for the USA or European countries, making them unsuitable for victims of DV in developing/underdeveloped countries. In order to increase the utility of these applications and make them more user-friendly, it is important that the applications are locally customized. Another critical aspect of developing health-related applications is the importance of supervision from healthcare-related specialists, which many applications lack. False information and unsupervised applications can cause more harm than benefit.

In this paper, we briefly reviewed the potential of smartphones in supporting DV victims and reducing its related stigma. We also introduced the first faculty-based Iranian DV prevention app in order to call for action and support from colleagues and organizations. We hope this will be a starting

1 https://irpsychiatry.ir/fa/weblog/171082/
بیانیه-هیات-داوران-دور-ششم-جایزه-استاد-داویدیان

point for developing countries to join the club and utilize the extensive potential of DV management smartphone apps.

Author contributions

NS has provided the main idea of the application. ME has designed and developed the application. MP has contributed in translating the dataset from Persian to English. AG has written the first draft and manuscript. HMA has contributed significantly to reviewing the manuscript critically. AT and FF have reviewed the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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

Publisher's note

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Public stigma profile toward mental disorders across different university degrees in the University of Valencia (Spain)

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Background: A large proportion of studies carried out in recent years in different populations have shown that stigma toward mental disorders is highly prevalent. In the present study we conducted a comprehensive assessment of stigma to describe and compare stigma toward mental disorders in students enrolled in five different university degrees.

Methods: Three hundred and twenty-five students from the University of Valencia (Spain), attending the second term of their first-degree courses in the faculties of medicine, psychology, teaching, economics, and data science participated in this cross-sectional study. Stigma was measured using: the Reported and Intended Behavior Scale (RIBS), the Scale of Community Attitudes toward Mental Illness (CAMI), the Attribution Questionnaire (AQ-27), and the Knowledge about Mental Illness test (KMI).

Results: We found different patterns of stigma according to gender, the fact of knowing or living with a person with mental disorders and the university degree studied. Overall, women show fewer stigmatizing attitudes than men but similar stereotypes and prejudice toward people with mental disorders. However, the pattern of results across degrees is more complex. Overall, students of medicine, psychology and teaching showed fewer stigmatizing attitudes than students of economics and data science but differences between degrees were more subtle in stereotypes and prejudice toward people with mental disorders.

Conclusion: Our study suggests the existence of different profiles of stigma in relation to mental disorders in university students. These profiles varied in relation with the degree being studied, gender and already knowing or living with a person with mental disorders.

KEYWORDS

stigma, mental disorders, university students, attitudes, attributions, prejudice, stereotyping

Introduction

Stigma is identified as one of the key issues in mental illness (MI) (1, 2). Stigmatizing stereotypes and prejudices toward MI cause discrimination and exclusion behaviors that increase self-stigma, delay seeking treatment and hinder social functioning in people with MI (3, 4).

Several models have been put forward attempting to understand stigma and to describe the components of this construct and their interrelations (5–9). These models largely agree that stigma is a complex and multidimensional construct encompassing several factors. The social cognition model (10) established that MI stigma encompasses three components: beliefs, attitudes, and behaviors. Firstly, erroneous or false social beliefs constitute stereotypes: general beliefs about the features, attributes, and behaviors. For instance, thinking that the mentally ill are dangerous, incompetent and responsible, e.g., that they are to blame for their MI (10). Secondly, prejudices are generalized attitudes toward members of a social group and involves emotional aspects (10). For example, feeling scared, angry, or benevolent toward individuals with a MI. Thirdly, discrimination is a behavior directed against a social group based on prejudice, in other words, the behavioral result of prejudice. For instance, an employer who does not hire a job applicant purely because of their having a MI. Discriminative behaviors also include a higher desire for social distance from those with MI.

Different studies have consistently found that university students show high levels of public stigma. Assessment of stigma in students is important because they can become the target audience for anti-stigma programmes (11, 12). A recent review concluded that the presence of stigma toward MI among medical university students is widespread, with a prevalence of up to 97% (13). Stigmatizing attitudes and desire for more social distance have also been found among psychology students (14, 15). These studies also found that being familiar with individuals with psychiatric disorders or having had to visit a psychologist for personal reasons were factors associated with less social distance from people with MI. When it comes to the management of people with poor mental health, such findings for future health care professionals may result in negative consequences. A study in New Zealand found that most psychology students had stereotypes such as beliefs that mental patients are unpredictable, antisocial, and dangerous (16). Similar stigma-related issues have also been found among students of other health science degrees, such as nursing and pharmacy (17, 18). Fewer studies have been conducted in degrees that were non-healthcare related.

Despite growing research in this area, very few studies have compared this topic across different university degrees. Moreover, most of these comparative studies only assessed specific aspects of stigma. For instance, medical and dental university students showed more willingness to interact with a person labeled as mentally ill, e.g., less negative attitudes, compared to social science and engineering undergraduates from Hong Kong (19). In a study focusing only on male undergraduates in the US, those in science, technology, engineering, and mathematics (STEM majors) reported lower mental health literacy (knowledge) as well as less positive attitudes and intention to seek help for mental health issues, compared to students in non-STEM majors (20). Moreover, students of social sciences, assessed with the Opening Minds Scale for Healthcare Providers (OMS-HC), had significantly lower explicit stigmatizing attitudes than engineering students from Canada (21). In addition, lower explicit stigmatizing attitudes were found in female students, in those with a history of MI, and in those who have had a close relationship with a person with a MI (21). In the US, psychology, counseling, and social work students had a similar need for social distance from people with MI, as measured by the Social Distance Scale (22).

The results of other studies challenge the notion that stigmatizing behaviors toward the mentally ill are less severe in non-Western societies. Compared to medical students, arts/humanities and science/technology students from Nigeria showed a higher desire for social distance toward people with MI, in a modified version of Bogardus Social Distance Scale (23). In addition, female gender and not having a relative with a MI were predictors of high desire for social distance (23). In another study conducted in Nigeria, pharmacy students had more positive attitudes toward MI than those from teaching, arts, and social science colleges (24). Nevertheless, male gender, older age, a previous visit to a mental hospital and having a relative or friend with a MI, all significantly contributed to having fewer stigmatizing attitudes. Other studies compared stereotypes across degree courses in non-Western universities, which is relevant given that stereotypes are culturally defined (10). In Egypt, students enrolled in science degrees had more positive beliefs toward MI, assessed with the Belief about Mental Illness Scale, compared to medicine and pharmacy students (17). Specifically, pharmacy students self-reported that mentally ill people are dangerous and that mental illnesses take more time to heal than physical illnesses. Moreover, Qatari students showed significant rates of negative knowledge, attitudes, and beliefs about MI (25). Overall, these outcomes were more favorable among students enrolled in non-science-based colleges (comprising law, business, teaching, arts, and Islamic studies) compared to those in science-based degrees (comprising medicine, pharmacy, engineering and general sciences) (25).

In all, very few studies so far have compared stigma-related outcomes across different university degree courses nor have they employed a comprehensive assessment of the different aspects of stigma toward MI. The present study was designed to bridge that research gap. We adopted a multidimensional perspective to describe and compare stigma toward mental health among students enrolled in five different university degrees: Teaching, Economics, Data Science, Psychology and

Medicine. The rationale to choose these degrees is as follows. Future teachers are the ones who will educate children and adolescents about this topic and this could therefore help them in the early detection of MI, which is a key factor in prognosis. In addition, future teachers can transmit their attitudes and behaviors to students, which will in turn have an impact on society. We were also interested in recruiting students enrolled in other degrees which have received far less attention previously, such as economics and data science students. The former can be involved in hiring employees in the future, so establishing the degree of MI stigma in this group seems key to approach the likelihood of integrating patients with mental health problems into the work market (26). Finally, data science students represent a group not involved in the future healthcare provision, education, and employment of individuals with a MI. Furthermore, we also aimed to analyse the attitudes toward MI of future clinicians and psychologists because they will be the future healthcare providers to people with MI.

In Spain, studies with university students have shown that medical and nursing students had more negative attitudes than psychology and occupational therapy students in several stigma-related themes: recovery, dangerousness, uncomfortability, disclosure, and discriminatory behavior (27). In another study evaluating the effect of internships in the last courses in the degrees of nursing, psychology and occupational therapy, results showed that although the effect was significant in the reduction of stigma toward people diagnosed with severe mental disorder in the degrees of nursing and psychology, it was small (28). Spanish teaching students have also participated in stigma studies. In a study comparing different countries with teaching students in different courses levels, results showed that the highest rates of stigma were in Spain and the lowest were in Canada, while Russia displayed intermediate values (29).

The aim of our study was to describe and compare stigma toward MI among students enrolled in the abovementioned five university degrees.

Methods

Participants

The questionnaires were administered to 325 undergraduate students from the University of Valencia (Spain) in their first year of the degrees of medicine ($n = 69$), psychology ($n = 90$), teaching ($n = 70$), economics ($n = 46$) and data science ($n = 50$). The participants' ages ranged from 18 to 54 years (M = 19.82; SD = 4.23), and 68.62% were females. A convenience sampling procedure was used. Consent was obtained from teachers in each degree to recruit participants during their class time. During class, students were asked to participate in the study and at that time they completed the questionnaires. In our sample, since the population size of students enrolled in first course of the target degrees was 1,545 people, and assuming a probability $p = q = 0.50$ and a confidence level of 95%, the sampling error was 4.8%. Sampling errors for each group were: 10.9% in teaching, 9.3% in psychology, 10.5 in medicine, 12.8 in economics and 6.7 in data science.

Instruments

Knowledge about mental illness test

This test (30) measures knowledge about MI using 13 true, false, and not sure items that assess the level of knowledge that respondents have about MI, its causes, and possibilities of recovery. KMI score was computed as the number of correct responses, with higher scores indicating more knowledge about MI.

Reported and intended behavior scale

This scale (31) has eight items divided into two groups that measure familiarity, contact, and intentions to have contact with people with MI. The first four items ask the respondent about their familiarity and contact with people with MI using yes or no responses. We used these four items to identify and to assess the percentage of students that have known or know someone with a MI and the percentage of students that have lived/worked or are living/working with a person with MI.

Scale of community attitudes toward mental illness

This scale (32) evaluates the attitudes of the general population toward people with MI, focusing on opinions regarding the integration of people with MI in the community. It has 40 items with a five-point Likert scale format grouped in four dimensions (authoritarianism: the belief that people with MI are inferior and must be treated coercively; benevolence: a sympathetic view for those experiencing MI based on humanistic parameters; social restrictiveness: a view that the mentally ill are a threat to society; and community mental health ideology: concerned with the therapeutic value of the community and acceptance of de-institutionalized care). The Spanish version of the scale had a Cronbach α of 0.86 (33).

Attribution questionnaire (AQ-27)

This questionnaire was developed by Corrigan et al. (34) and measures stigma toward people with MI. It describes briefly a man diagnosed with schizophrenia that lives alone, works as a lawyer and has been hospitalized several times because of his illness. The 27 items of the questionnaire evaluate stereotypes using a 9-point Likert scale. The 27 items are grouped in 9 factors (responsibility, pity, anger, dangerousness, fear, help, coercion,

segregation, and avoidance). Higher scores indicate higher values in that factor. The Spanish version of the questionnaire (35) had a Cronbach α of 0.86

Procedure

All the participants completed the questionnaires through an online survey using the survey application tool LimeSurvey (https://www.limesurvey.org/es/) between February and March during the second term of the first-year degree course. Prior to their participation, the participants gave their written informed consent. The study was approved by the Ethics Committee of the University of Valencia.

Statistical analysis

All statistical analyses were performed using the IBM-SPSS v.26 statistical package. Summary statistics were carried out through frequencies and percentages for categorical variables and by means and standard deviations for quantitative variables. Initially, the distributions of categorical variables were compared through Pearson's Chi-Squared tests, and the differences in age and KMI as a function of degree with ANOVAs. Then, different one-way between groups multivariate analysis of variance (MANOVA) were calculated to explore differences in the CAMI and AQ-27 tests in terms of gender, knowledge of people with MI, living with a person with MI and student group. *Post-hoc* analyses were computed using Tukey's multiple comparisons test to analyse differences between student groups.

Results

A total of 325 students completed the full survey. Table 1 shows the distribution of students in the different undergraduate degrees in terms of gender, familiarity with mental health problems and results in the KMI test. In the groups of medicine, psychology, and teaching, the proportion of women over men was higher, but it was lower in the economics and data science groups. However, the distribution of students that know or have known a person with MI was the same in all groups, as was the case for students that live or have lived with a person with MI. The ANOVAs for age and KMI results revealed that both variables were significant. *Post-hoc* comparisons showed significant pairwise differences between medicine and economic students in terms of age and between several groups in terms of knowledge about MI as assessed by the KMI test (see Table 1).

Agreement with the statements in each AQ-27 items

Table 2 shows the results in the AQ-27 questionnaire expressed as the percentage of students that agree with the statement in each item of the questionnaire, scores 7 to 9 in the item (31). Only a small percentage of students think that people with MI are responsible for their illness (0.92–18.15%) and that they should be separated from their community (2.46–5.54%). The percentage of students who feel anger or fear toward persons with MI or perceive them as dangerous was also low (anger: 1.23–2.77%; fear: 3.08–4.31%; dangerousness: 1.23–6.77%). In line with these low stigmatizing attitudes, a high percentage of students are willing to help people with MI (69.54–85.54%) or will not avoid them (49.23–62.77%). Results also showed that although around fifty percent of students have feelings of pity or attitudes of concern toward people with MI (26–77%—59.38%) they are in favor of forcing patients to medicate or seek medical help (20.31–77.54%).

Gender differences

Scores on all four CAMI subscales significantly differed between women and men. Overall, women have less authoritarian and socially restrictive attitudes than men, and more benevolent and accepting attitudes when it comes to integrating patients' rehabilitation within the community (Table 3). However, in the AQ-27, women and men only differed in one of the nine dimensions. Specifically, women were more willing to offer help to persons with MI than men (Table 4).

Differences as a function of contact with people with mental illness

There were no significant differences in stigma in the students when considering whether they knew or have known people with MI in any of the subscales of the CAMI nor in any of the AQ-27 dimensions. However, the fact of living or working with or having lived or worked with a person with MI revealed significant differences in comparison with students that do/did not. Analysis of the CAMI subscales (Table 3) showed that students living/having lived or working/having worked with a person with MI have more benevolent and accepting attitudes related with the integration of patients' rehabilitation within the community and also greater willingness to help. At the same time, they have less authoritarian and restrictive attitudes. Those students also have lower negative attitudes of fear, segregation and avoidance toward people with MI and higher helping attitudes, as assessed by the AQ-27 (Table 4).

TABLE 1 Demographic characteristics and scores in the KMI and RIBS in the five university degrees.

	Medicine ($n = 69$)	Psychology ($n = 90$)	Teaching ($n = 70$)	Economics ($n = 46$)	Data science ($n = 50$)	Statistic
Age M (SD), years	20.70 (5.38)	20.24 (5.25)	20.00 (3.87)	18.37 (0.83)	18.94 (1.41)	$F = 2.96$, $p = 0.02$[a]
Gender, *n (%)*						
Men	15 (21.70)	12 (13.30)	15 (21.40)	28 (60.90)	32 (64.00)	$x^2 = 67.43$, $p < 0.001$
Women	54 (78.30)	77 (85.60)	55 (78.60)	17 (37.00)	17 (34.00)	
Other	0	1 (1.10)	0	1 (2.20)	1 (2.00)	
RIBS-Know, *n* (%)						
Yes	53 (76.80)	73 (81.10)	49 (70.00)	31 (67.40)	32 (64.00)	$x^2 = 6.65$, $p = 0.156$
No	16 (23.20)	17 (18.90)	21 (30.00)	15 (32.60)	18 (36.00)	
RIBS-Live/work, *n* (%)						
Yes	34 (49.30)	42 (46.70)	40 (57,10)	19 (41,30)	19 (38.00)	$x^2 = 5.24$, $p = 0.264$
No	35 (50.70)	48 (53.30)	30 (42.90)	27 (58.70)	31 (62.00)	
KMI M (SD)	10.51 (1.29)	10.97 (1.17)	9.76 (1.62)	10.26 (1.50)	10.68 (1.30)	$F = 8.29$, $p < 0.001$[b]

[a] *Post hoc* comparisons: Medicine > economics.
[b] *Post hoc* comparisons: Medicine > teacher; psychology > teacher and economics; data science > teacher.
RIBS: Familiarity with people with mental illness: Live/work with a person with mental illness; Know a person with a mental illness.
KMI: Knowledge of mental illness test.

Differences between university degrees

Significant differences were found in the four subscales of the CAMI (Table 3) and in six subscales of the AQ-27 (Table 4) but there was not a homogenous pattern of differences between groups. Overall, in the CAMI, medicine, psychology and teaching students show more positive benevolent attitudes and accepting attitudes related with the integration of patients' rehabilitation within the community than students of economics and data science. Moreover, the former group showed less authoritarian and socially restrictive attitudes. However, differences between teaching and data science students were significant in benevolence attitudes only. Regarding the AQ-27, medical students showed more positive attitudes in anger, dangerousness, fear, help, segregation and avoidance than economic students. Psychology students also showed more positive attitudes than their peers in economics in terms of anger, help and segregation. Furthermore, medicine and psychology students showed more positive help attitudes than students of data science. Lastly, fewer anger attitudes were shown by students of medicine than those of teaching.

Discussion

Stigma toward MI is a public health problem because of the impact it has on the lives of people with MI, creating barriers in employment opportunities, independent living, and recourse to health services.

Overall, the results of our study show that only a small percentage of students think that persons with MI are responsible for their illness and should be separated from their community, feel anger or fear or perceive them as dangerous and a high percentage of students are willing to help people with MI or do not intend to avoid them. Furthermore, it is evident that around half of all students have feelings of pity or attitudes of concern, and they are in favor of forcing patients to medicate or seek medical help.

Some relevant findings arose regarding beliefs, attitudes and behaviors toward people with MI, in terms of gender, knowledge of people with MI, living with a person with MI and student degree.

Firstly, we found that women have fewer authoritarian and socially restrictive attitudes than men, more benevolent and accepting attitudes related with the integration of patients' rehabilitation within the community and are more willing to offer help. These results are in line with previous studies (21, 23, 36, 37). Nonetheless, some studies have found opposite results, for example, a higher proportion of women than men stated that they would feel afraid to have a conversation with someone diagnosed with schizophrenia (38) or have not found differences (39). These results could be explained by two arguments that have been put forward in the literature: the general belief that men can manage their mental problems (40), and the idea that women behave differently from men in the face of MI, with women acting in a friendlier way (41, 42).

Secondly, there are no differences between degrees in the percentage of students knowing or living/working with a person with MI. In fact, the percentages in both cases were high for all degrees (between 64 and 81%; and between 38 and 57%, respectively). However only the fact of living/working is associated with lower stigma scores, specially in stigma behavior

10.3389/fpsyt.2022.951894

TABLE 2 Means and standard deviations of the scores for each item and percentage of participants that agree with the statement (percentage of participants that score 7, 8 or 9 in the item) in each AQ-27 item ($n = 325$).

	Mean (SD)	%
Responsibility*		
10. I would think that it is José's fault that he is in his current situation	1.30 (0.95)	0.92
11. To what extent do you believe that the cause of José's current situation is controllable?	4.42 (2.07)	18.15
23. In your opinion, to what degree is José responsible for his current situation?	2.51 (1.81)	4.31
Pity		
9. I would feel pity for José	4.67 (2.42)	26.77
22. To what extent do you understand José?	6.58 (2.03)	59.38
27. How much concern would you feel for José?	6.10 (2.21)	50.15
Anger*		
1. I would feel violent because of José	3.04 (1.65)	2.77
4. To what extent would you feel angry with José?	1.56 (1.19)	1.23
12. To what extent would you feel irritated by José?	2.40 (1.60)	2.77
Dangerousness*		
2. I would feel unsafe around José	3.40 (1.84)	7.08
13. In your opinion, to what extent is José dangerous?	3.50 (1.70)	6.77
18. I would feel threatened by José	2.28 (1.49)	1.23
Fear*		
3. José would terrify me	2.38 (1.59)	3.38
19. To what extent would José scare you?	2.73 (1.68)	4.31
24. To what extent would José terrify you?	2.47 (1.67)	3.08
Help^		
8. I would be willing to talk to José about his problem	7.95 (1.5)	85.54
20. What is the probability that you would help José?	7.72 (1.50)	80.31
21. With what certainty do you think you would help José?	7.23 (1.74)	69.54
Coercion*		
5. If I were in charge of José's treatment, I would require him to take his medication	7.47 (1.97)	77.54
14. To what extent do you agree that José should be forced to seek medical treatment even if he does not want to?	6.21 (2.24)	51.08
25. If I were in charge of José's treatment, I would force him to live in a supervised apartment	4.26 (2.25)	20.31
Segregation*		
6. I think that José poses a risk to his neighbors if he is not hospitalized	2.93 (1.82)	5.54
15. I think it would be better for José's community if he was confined in a psychiatric hospital	2.36 (1.76)	4.00
17. To what extent do you think that a psychiatric hospital, where José could stay away from his neighbors, is the best place for him?	2.54 (1.69)	2.46
Avoidance^		
7. If I were an employer, I would interview José for a job	6.18 (2.16)	51.69
16. I would share a car pool with José every day	6.00 (2.26)	49.23
26. If I were a landlord, I would probably rent an apartment to José	6.62 (2.14)	62.77

*High scores correspond to high scores in stigma.
^High scores correspond to low scores in stigma.

intentions. These results are in line with previous studies (19, 21, 23, 24) and support the idea of the relevance of incorporating people with MI as employees or in other daily life activities in the community for its probable effect in reducing stigma. They also support the strategy of including interpersonal contact with people with MI in anti-stigma interventions (10).

As members of a society, students cannot remain immune to societal influences characterized by the disrespect toward patients with MI (43). However, the nature of the chosen university programs probably already constitutes a different starting point in beliefs, attitudes and behaviors. In our study, medicine and psychology students showed less authoritarianism and social restriction and greater benevolence and CMHI. At the same time, economics showed the higher stigmatizing scores in this dimensions, and teaching and data science showed an intermediate score. There are also degree differences

10.3389/fpsyt.2022.951894

TABLE 3 Means and standard deviations in the CAMI scale dimensions.

	Authoritarianism	Benevolence	Social restrictiveness	CMHI[a]
Total score	21.94 (4.10)	42.97 (4.44)	17.97 (3.73)	40.78 (5.14)
Gender				
Women ($n = 220$)	21.34 (3.98)	43.94 (3.83)	17.58 (3.52)	40.72 (4.92)
Men ($n = 102$)	23.16 (4.10)	41.03 (4.90)	18.75 (4.03)	39.59 (5.44)
	$F = 14.24$; $p < 0.001$	$F = 33.51$; $p < 0.001$	$F = 7.04$; $p = 0.008$	$F = 8.67$; $p = 0.003$
RIBS-Know				
Yes ($n = 238$)	21.75 (4.10)	43.09 (4.39)	17.89 (3.70)	41.00 (5.19)
No ($n = 87$)	22.48 (4.07)	42.63 (4.59)	18.18 (3.84)	40.15 (4.97)
	$F = 2.05$; $p = 0.153$	$F = 0.67$; $p = 0.413$	$F = 0.39$; $p = 0.532$	$F = 1.77$; $p = 0.185$
RIBS-Live/work				
Yes ($n = 154$)	21.14 (4.07)	43.74 (4.12)	17.48 (3.81)	41.53 (4.91)
No ($n = 171$)	22.67 (4.00)	42.27 (4.61)	18.41 (3.62)	40.09 (5.26)
	$F = 11.75$; $p < 0.001$	$F = 9.12$; $p = 0.003$	$F = 5.08$; $p = 0.025$	$F = 6.46$; $p = 0.012$
Degree[b]				
Medicine	20.86 (3.71)	43.83 (4.69)	17.97 (3.66)	41.32 (5.20)
Psychology	20.73 (3.60)	44.58 (3.19)	16.76 (3.05)	42.54 (4.35)
Teaching	22.56 (4.34)	43.40 (3.64)	17.87 (3.67)	40.93 (4.31)
Economics	24.48 (4.00)	39.76 (4.50)	20.26 (4.31)	37.59 (6.03)
Data science	22.44 (4.00)	41.22 (5.02)	18.18 (3.59)	39.56 (5.10)
	$F = 8.95$; $p < 0.001$	$F = 13.51$; $p < 0.001$	$F = 7.29$; $p < 0.001$	$F = 8.77$; $p < 0.001$
	Medicine < Economics	Medicine > Economics	Medicine < Economics	Medicine > Economics
	Psychology < Teaching	Medicine > Data science	Psychology < Economics	Psychology > Economics
	Psychology < Economics	Psychology > Economics	Teaching < Economics	Psychology > Data science
		Psychology > Data science	Data science < Economics	Teaching > Economics
		Teaching > Economics		
		Teaching > Data science		

[a]CMHI: Community mental health ideology; [b]*Post hoc* comparisons between degrees.
F: Results of the ANOVAs comparing gender, familiarity and contact with mental illness, and degree.

in beliefs (dangerousness), attitudes (anger), and behaviors (help, segregation and avoidance). Medicine and psychology students present the lowest stigmatizing scores and economics the highest. Medicine and psychology programs focus their attention on the care of health, including mental health This is also the objective of students when choosing to follow these degrees and could be the reason for their lower stigma scores.

Lack of knowledge, stereotypes and prejudices in mental health are usually common among students in secondary and university education, and this is why several authors point out the need to work with this population (44). Implementing anti-stigma strategies would have implications in reducing the different aspects that constitute social stigma and would benefit community integration. It is also important to remember that the WHO (1) points out that stigma is one of the most important problems related to mental health in contemporary society and mental illness-related stigma is present in every country (1, 45).

Conclusions

Our study has delineated a stigma profile toward MI and has demonstrated the existence of stigma in university students and the existence of differences between the degrees. This justifies the need to introduce brief anti-stigma interventions taking into account the profile that characterizes each group. Research has shown that everyone can contribute to stigmatization (12) and that everyone has opportunities to fight against it (46), including institutions such as Universities that could launch anti-stigma intervention programs. Future studies should evaluate these programs.

Students from health sciences show more positive beliefs, attitudes and behaviors. However, these students will work with people with MI so interventions to reduce stigma among these students should be carried out continuously, because stigma is resilient and resistant to intervention (12).

TABLE 4 Means and standard deviations in the AQ-27 dimensions.

	Responsibility*	Pity*	Anger*	Dangerousness*	Fear*	Help^	Coercion*	Segregation*	Avoidance^
Total score	8.22 (3.50)	17.35 (4.36)	7.00 (3.41)	9.19 (4.38)	7.59 (4.53)	22.90 (3.96)	17.93 (4.94)	7.82 (4.49)	11.21 (4.98)
Gender									
Women ($n = 220$)	8.26 (3.58)	17.38 (4.07)	6.79 (3.43)	9.06 (4.19)	7.55 (4.43)	23.49 (3.76)	18.05 (4.90)	7.59 (4.45)	10.84 (5.02)
Men ($n = 102$)	8.05 (3.31)	17.45 (4.89)	7.46 (3.39)	9.53 (4.80)	7.72 (4.78)	21.78 (4.00)	17.75 (5.05)	8.35 (4.59)	11.96 (4.84)
	$F = 0.25$; $p = 0.616$	$F = 0.02$; $p = 0.887$	$F = 2.68$; $p = 0.103$	$F = 0.78$; $p = 0.377$	$F = 0.09$; $p = 0.768$	$F = 13.77$; $p < 0.001$	$F = 0.26$; $p = 0.613$	$F = 2.00$; $p = 0.158$	$F = 3.55$; $p = 0.060$
RIBS-Know									
Yes ($n = 287$)	8.34 (3.48)	17.39 (4.34)	6.98 (3.57)	9.19 (4.50)	7.63 (4.60)	22.96 (4.00)	17.96 (4.94)	7.86 (4.59)	10.98 (4.91)
No ($n = 38$)	7.92 (3.56)	17.25 (4.42)	7.06 (2.95)	9.20 (4.05)	7.48 (4.03)	22.74 (3.87)	17.86 (4.98)	7.71 (4.24)	11.84 (5.16)
	$F = 0.90$; $p = 0.343$	$F = 0.06$; $p = 0.801$	$F = 0.03$; $p = 0.862$	$F = 0.01$; $p = 0.991$	$F = 0.07$; $p = 0.795$	$F = 0.21$; $p = 0.649$	$F = 0.03$; $p = 0.872$	$F = 0.07$; $p = 0.798$	$F = 1.90$; $p = 0.169$
RIBS-Live/work									
Yes ($n = 154$)	8.10 (3.65)	17.05 (4.05)	6.71 (3.43)	8.77 (4.20)	6.95 (3.85)	23.38 (3.78)	17.62 (4.94)	7.12 (4.25)	10.54 (4.63)
No ($n = 171$)	8.34 (3.36)	17.63 (4.61)	7.27 (3.38)	9.57 (4.51)	8.16 (5.00)	22.47 (4.08)	18.22 (4.94)	8.45 (4.62)	11.81 (5.22)
	$F = 0.39$; $p = 0.535$	$F = 1.41$; $p = 0.237$	$F = 2.20$; $p = 0.139$	$F = 2.69$; $p = 0.102$	$F = 5.87$; $p = 0.016$	$F = 4.37$; $p = 0.037$	$F = 1.17$; $p = 0.281$	$F = 7.27$; $p = 0.007$	$F = 5.37$; $p = 0.021$
Degree[a]									
Medicine	7.71 (3.69)	16.62 (4.38)	5.99 (2.77)	8.12 (4.29)	6.51 (3.74)	23.97 (3.34)	17.77 (4.48)	6.67 (3.50)	9.87 (4.72)
Psychology	8.91 (2.97)	17.47 (3.76)	6.49 (3.04)	8.89 (3.82)	7.08 (4.06)	23.60 (3.59)	18.13 (4.42)	7.54 (4.00)	11.08 (5.02)
Teaching	7.80 (3.93)	18.17 (4.44)	7.86 (3.90)	9.54 (4.35)	8.34 (4.67)	23.03 (3.96)	16-91 (5.80)	7.79 (5.06)	11.57 (4.95)
Economics	8.41 (3.309	17.70 (5.06)	8.35 (3.57)	10.74 (5.01)	8.59 (4.96)	21.59 (3.77)	18.98 (4.93)	9.93 (5.52)	12.87 (4.78)
Data science	8.12 (3.58)	16.70 (4.45)	6.90 (3.41)	9.30 (4.54)	8.04 (5.37)	21.20 (4.76)	18.28 (5.07)	8.00 (4.14)	11.26 (5.16)
	$F = 1.55$; $p = 0.187$	$F = 1.48$; $p = 0.209$	$F = 5.20$; $p < 0.001$	$F = 2.77$; $p = 0.028$	$F = 2.48$; $p = 0.044$	$F = 5.88$; $p < 0.001$	$F = 1.38$; $p = 0.240$	$F = 3.93$; $p = 0.004$	$F = 2.69$; $p = 0.031$
			Medicine < Teaching	Medicine		Medicine > Economics		Medicine < Economics	Medicine < Economics
			Medicine < Economics	< Economics		Medicine > Data science		Psychology< Economics	
			Psychology < Economics			Psychology > Economics			
						Psychology >'Data science			

*High scores correspond to high scores in stigma; ^High scores correspond to low scores in stigma; [a]Post hoc comparison between degrees.
F: Results of the ANOVAs comparing gender, familiarity and contact with mental illness, and degree.

10.3389/fpsyt.2022.951894

In the case of teaching students, primary and secondary teachers often have a limited amount of mental health knowledge (47, 48) and do not feel confident about helping students with mental health problems (49). However, they can play an important role in the early identification of MI and in early intervention (50). It is therefore necessary that teaching students also participate in anti-stigma interventions, as is the case of economic students that, globally, have shown the highest levels of stigma.

Limitations

This study has only analyzed five university degrees, it would be interesting to extend it to other degrees in science, health sciences and social sciences. In this work, validated and widely used evaluation instruments have been used in the field of stigma study (KMI, part of the RIBS, CAMI and AQ-27) (51), but many published studies use other instruments, which makes it difficult to make comparisons. To overcome this, it would be useful to reach expert consensus, as has been done in other fields (52) on the most appropriate instruments for the assessment of the different aspects involved in the stigmatization process.

Research based on self-reported data could favor information bias due to the social desirability effect. Another key issue in survey-based research is whether respondents differ from non-respondents in some way that is likely to impact systematically the prevalence of stigma issues. The use of convenience samples and self-reporting instruments are potential limitations for this study.

The present study also has some strengths. It is one of the few studies to compare stigma across several university degrees in Spain. Moreover, we employed a comprehensive assessment of the different aspects of stigma. In the Spanish population one out of ten people over the age of 15 (10.8%) suffers from some type of mental disorder and 2.1% of the population has some type of severe MI (53), which gives a good idea of the number of people who may be suffering the effects of stigmatizing beliefs, attitudes and behaviors. If, in addition, we take into account the fact that some studies have shown relatively high levels of stigma in the general population (54), the need to know the profile of stigma in the general population, and in subgroups within the population, such as university students, is justified in order to act accordingly to reduce public stigma. The aim of future studies should be to increase the sample of university students and incorporate other groups such as high school students, the general population, health and socio-health professionals, as well as professionals from other fields such as those related to world of work.

Data availability statement

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

Ethics statement

The studies involving human participants were reviewed and approved by Ethics Committee of Universidad of Valencia (Spain). The patients/participants provided their written informed consent to participate in this study.

Author contributions

JCR, IF-D, VB-M, and ML-G contributed to the conception and design of this project and to the writing of the first draft of the manuscript. JCR, CD, PS-M, and JV-F conducted the methodology and analysis. CP-G, MF-D, FP-G, and LS acquired the data and made important contributions to sections of the manuscript. IF-D and CD obtained the funding. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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

Publisher's note

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Investigation of a group of Iranian theater artists' mental health and attitude toward patients with mental disorders

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Introduction: Stigmatizing attitude toward patients with severe mental disorders is one of the main obstacles of improving the mental health of societies. Media plays an important role in how the public views mental health issues. Thus, we have performed this study to investigate the Iranian theater artists' mental health status, and their view toward patients with severe mental disorders.

Methods: This cross-sectional study was performed *via* an online anonymous survey including the Social Distance Scale and the Dangerousness Scale measuring the attitude of participants toward patients with severe mental disorders, and the 28-item General Health Questionnaire (GHQ-28). It was disseminated to artists who had the experience of working in theater in the past year in Iran.

Results: Our survey was responded by 104 artists. Social Distance Scale scores' mean was 10.67 (scores can range from 0 to 21) and the Dangerousness Scale scores' mean was 28.87 (scores can range from 8 to 56); higher scores indicate worse discrimination. Our participants' strongest fears were to let someone with a severe mental disorder to take care of their children, and for these groups of patients to obtain a hunting license. Twenty-six (25%) participants were at risk of moderate to severe anxiety, and 18 (17.3%) participants were at risk of moderate to severe depression.

Conclusion: By and large, our participants did not have a positive attitude toward patients with severe mental disorders. Providing the knowledge of mental health issues can help the general public to be more tolerant of the mentally ill and specifically, theater can be employed to fight stigmatizing mental health issues by educating its audience.

KEYWORDS

social stigma, community psychiatry, mental illness, mental health, art

Introduction

Stigma is defined as disapproval of an individual or group based on their distinguishing characteristics. Stigmatizing mental health issues exists on three levels: individual, interpersonal, and institutional. It stems from misconception and prompts falsely applied stereotypes, prejudice, and discrimination (1, 2).

Discrimination takes different forms and may emerge as social disapproval and exclusion. It may lead to decline in social status, worsening the illness, aggression, interpersonal conflicts, and isolation. Furthermore, stigma may encourage substance abuse and reluctance toward treatment. Consequently, people with mental health issues do not just have to carry the burden of their symptoms but also deal with reduced quality of life (1–3).

Previous studies have reported that stigma invigorates the general public to withhold help from minorities (4). Protest, education, and contact are the three suggested components against stigma (5). Some studies have indicated that educating the public with an accurate perception of mental health issues makes stigmatizing less likely (6). Several studies have reported improved attitudes as the outcome of educational programs, which can be used for a wide age range (6–10). There also have been reports of positive results attributed to the public being in contact with patients with severe mental disorders (11).

Media plays a vital role in how the public views mental health issues, and its imprecise representation in television and films has been reinforcing the negative stereotypes. It has been portraying the mentally ill as potentially dangerous people to society (12).

As theater creatively interacts with its audience, it can either be used to fight mental disorders stigma or prompt the negative attitude toward patients with severe mental disorders. Several studies indicated the theater's positive effects on reducing stigma among teenagers and young adults (13–19). There have been reports of the possibility for the role of the dramaturg (13), live presentations (14), applied drama (15), performing arts (16), and theatrical presentations (17) in reducing stigma. A review for evaluating the impact of mass media interventions including film, photographs, radio and comics reported that art interventions are generally effective when they use multiple art forms, but with a small effect (18).

Previous studies have reported that significant rates of moderate to severe mental health issues exist among artists in different fields (19–21) which probably affects their work and what they present to the public. There also have been reports that one's mental health status, especially experiencing depressive symptoms, can affect their attitude toward the mentally ill (22). Considering the significant effect of the theater on public attitude toward patients with severe mental disorders, we conducted this study to evaluate a group of Iranian theater artists' mental health status and attitude toward this group of patients, and to investigate the possible link between these items.

Methods

Design

This cross-sectional study was performed *via* an online anonymous survey including the Persian versions of three questionnaires: the Social Distance Scale, the Dangerousness Scale, and the 28-item General Health Questionnaire (GHQ-28).

Data collection

The survey was open from June of 2021 until June of 2022, and was disseminated to 340 artists through social media (*via* email and chat applications). We used the snowball sampling method, starting at art centers and art schools based in Tehran. Thereafter artists across the country were contacted. The sample size was calculated with CI = 95% (confidence interval), $p = 0.24$ (population proportion) (23) and $d = 0.09$ (sampling error). The inclusion criteria were being over the age of 18, and having the experience of working in theater in the past year.

Tools

The Social Distance Scale (first developed by Link) and the Dangerousness Scale (first developed by Park) both present cases of patients with severe mental disorders and measure the attitude toward the target person. The Social Distance consists of seven questions and uses the Likert scale as "definitely willing/ probably willing/ probably not willing/ definitely not willing." The Dangerousness Scale consists of eight questions and uses the Likert scale as "strongly agree, rather agree, agree, nor agree or disagree, disagree, rather disagree, and strongly disagree". Higher scores indicate worse discrimination (24). Ranjbar Kermani et al. assessed and determined the validity and reliability of the Persian versions of the Social Distance Scale (Cronbach's alpha coefficient: 0.92, test-retest reliability coefficient: 0.89, content validity coefficient: 0.75) and the Dangerousness Scale (Cronbach's alpha coefficient: 0.96, test-retest reliability coefficient: 0.88, content validity coefficients: 0.77) (25, 26).

The 28-item General Health Questionnaire (GHQ-28) includes 28 questions in four subsections measuring the somatic symptoms, anxiety and insomnia, social dysfunction, and depression. Ebrahimi et al. assessed and determined the validity and reliability of the Persian version of the GHQ-28. Its Cronbach's alpha and split reliability co-efficient were 0.78, 0.97 and 0.90 respectively (27).

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TABLE 1 Sociodemographic characteristics of the participants.

Gender	62 (59.6%)
Male	
Female	42 (40.4%)
Age	18–56 (Mean: 29.50, Median: 30.00)
Marital status	79 (75.9%)
Single/divorced/widow	
In a relationship/married	25 (24.0%)
Role in theater	65 (62.5%)
Actor	
Director	27 (25.9%)
Scriptwriter	15 (14.4%)
Others	4 (3.8%)
Educational degree	81 (77.9%)
Masters or higher	
Bachelor's degree or lower	23 (22.1%)
History of visiting a psychiatrist	50 (48.0%)
Yes	
No	54 (51.9%)
History of receiving psychopharmacological treatment	27 (25.9%)
Yes	
No	77 (74.0%)
History of receiving non-psychopharmacological treatment	22 (21.1%)
Yes	
No	82 (78.8%)
History of admission in a psychiatric ward/hospital	1 (0.09%)
Yes	
No	103 (99.0%)

Ethical considerations

Participants responded to our survey voluntarily and anonymously. Our study was approved by the Institutional Review Board of Iran University of Medical Sciences (Reference: IR.IUMS.FMD.REC.1400.362).

Statistical analysis

Data were analyzed by IBM SPSS Statistics (v. 25.0). To report the frequencies and percentages of categorical variables, descriptive statistics were used, and only valid percentages are reported. The demographic data and the GHQ subscales were compared with the variables of the Social Distance Scale and the Dangerousness Scale, through Chi-Square Test.

TABLE 2 Subscales' scores and total scores of the 28-item General Health Questionnaire (GHQ-28).

	No/very low disorder to mild (*N*, %)	Moderate to severe (*N*, %)
Somatic symptoms	94 (90.3%)	10 (9.6%)
Anxiety and insomnia	78 (75%)	26 (25%)
Social dysfunction	99 (95.1%)	5 (4.8%)
Depression	86 (82.6%)	18 (17.3%)
Total score	89 (85.5%)	15 (14.4%)

Results

A total of 104 artists, within the age range of 18-56, responded to our survey, and more than half (59.6%, $N = 62$) of them were male. Table 1 presents the participants sociodemographic characteristics in detail.

We have presented the GHQ subscales' score in Table 2. Participants' Social Distance Scale scores ranged from 0 to 21 (Mean: 10.67, Median 10.0, SD: 4.922), and their Dangerousness Scale scores ranged from 11 to 54 (Mean 28.87, Median: 29.00, SD: 10.291). The responses to the Social Distance Scale, and the Dangerousness Scale are presented in Tables 3, 4, respectively.

No significant correlation was found between the demographic data, the GHQ subscales' scores, and the items of the Social Distance Scale, and the Dangerousness Scale.

Discussion

By and large, our participants' attitude toward patients with severe mental disorders was not positive. The Social Distance Scale scores' mean was 10.67 (±4.922), and the Dangerousness Scale scores' mean was 28.87 (±10.291). We found no significant correlation between the demographic data and the Social Distance Scale scores and the Dangerousness Scale scores, probably due to our small sample size. However, previous studies have reported that older age and marital status (being married) were indicators of negative attitude, and younger age, being female, and higher education were indicators of positive attitude toward patients with severe mental disorders (28–32).

Among the Social Distance Scale items, the question "*What do you think about someone like that person taking care of your children for an hour or two?*" received the most negative feedback. This result was unexpected as there has been no substantial report of child abuse by patients with severe mental disorders over the past years. Notwithstanding that prevention of any type of child abuse or assault is a critical issue among all societies, no rationale supports this fear, and it seems to stem from general attitudes. Besides, previous studies have reported

TABLE 3 Items and total scores of the Social Distance Scale (SDS).

	Definitely willing (*N*, %)	Probably willing (*N*, %)	Probably not willing (*N*, %)	Definitely not willing (*N*, %)
How would you feel about renting a room in your home to that person?	19 (18.3%)	35 (33.7%)	30 (28.8%)	20 (19.2%)
What do you think about working as a colleague in the same job as that person?	17 (16.3%)	36 (34.6%)	22 (21.2%)	29 (27.2%)
How do you feel if someone like that person is your neighbor?	24 (23.1%)	54 (51.9%)	16 (15.4%)	10 (9.6%)
What do you think about someone like that person taking care of your children for an hour or two?	22 (21.2%)	16 (15.4%)	22 (21.2%)	44 (42.3%)
What do you think about your children marrying someone like that person?	20 (19.2%)	21 (20.2%)	24 (23.1%)	39 (37.5%)
How do you feel about introducing someone like that person to a young lady who is your friend?	20 (19.2%)	29 (27.9%)	25 (24.0%)	30 (28.8%)
How do you feel about advising someone like that person to a friend for a job?	20 (19.2%)	56 (53.8%)	15 (14.4%)	13 (12.5%)
Total score	Range: 0–21, Mean: 10.67, Median 10.0, SD: 4.922			

that most child abuse perpetrators are among the families or acquaintances (33).

And among the Dangerousness Scale items, the statement "*There should be a law forbidding a former mental patient the right to obtain a hunting license*" received the most negative feedback. Over the past years in Iran, no murder report with a gun by patients with severe mental disorders has been recorded, which may be because private ownership of guns is illegal. The mass media has propagated the use of guns by these patients over time, especially in the United States of America, and this false image has affected the attitude of different populations and societies. Moreover, previous studies have reported that it is more likely for patients with severe mental disorders to become the victim rather than becoming the offender (34).

As we gathered, 26 (25%) participants were at risk of moderate to severe anxiety, and 18 (17.3%) participants were at risk of moderate to severe depression. In total, 15 (12.6%) participants were at risk of having moderate to severe mental disorders. Whereas, in a study conducted by Noorbala et al. among Iranian general population, using the same cut-offs, it was reported that 29.50% were at risk of anxiety, and 10.39% were at risk of depression. In total, 23.44% of the general population were suspected of moderate to severe mental disorders (23). Low rates of mental disorders among our participants are probably for the reason that people with low levels of anxiety and social dysfunction (a consequence of depression) enter the field of theater, and also, we had a small sample size. Moreover, Kegelaers et al. reported from the Netherlands, that 30% of the electronic music artists (19) and 51.6% of the classical musicians (20) experienced symptoms of depression/anxiety which is much higher than our result (12.6%). In addition, Topoglu et al. reported from Turkey, that 36% of the Turkish state symphony orchestras musicians were at risk of moderate/severe mental health issues, which also holds a higher prevalence than our study (21). All three studies had used the GHQ-12 questionnaire. The difference between our studies was probably due to this fact that the artists working in theater are required to be socially functional to qualify in the field. Also, the GHQ is a screening questionnaire rather than a diagnostic one.

We did not find any significant correlation between our participants' mental health status and their attitude toward patients with psychiatric disorders. However, a study conducted in Finland, reported that dealing with depressive symptoms, leads to a positive attitude toward people with depression (22).

Strengths and limitations

To the best of our knowledge, this is the first study in Iran to investigate the view of the artists working in theater on mental disorders. Our study is limited by a small sample size, social-desirability bias, and participation bias (participating in a study about psychiatric disorder may have also been a reason for holdback). Probably due to our small sample size, no significant correlation was found between the demographic data, the GHQ subscales' scores,

TABLE 4 Items and total scores of the Dangerousness Scale.

	Strongly Agree (*N*, %)	Rather agree (*N*, %)	Agree (*N*, %)	Nor agree or disagree (*N*, %)	Disagree (*N*, %)	Rather disagree (*N*, %)	Strongly disagree (*N*, %)
If a group of former mental patients lived nearby, I would not allow my children to go to the movie theater alone.	12 (11.5%)	7 (6.7%)	14 (13.5%)	18 (17.3%)	13 (12.5%)	11 (10.6%)	29 (27.9%)
If a former mental patient applied for a teaching position at a grade school and were qualified for the job, I would recommend hiring him/her.	22 (21.2%)	22(21.2%)	20 (19.2%)	16 (15.4%)	8 (7.7%)	16 (15.4%)	0
One important thing about mentally ill people is that you could not say what they will do in the next minute.	16 (15.4%)	8 (7.7%)	17 (16.3%)	22 (21.2%)	11 (10.6%)	14 (13.5%)	16 (15.4%)
If I knew someone had been mentally ill before, I would be less likely to trust them.	6 (5.8%)	12 (11.5%)	16 (15.4%)	18 (17.3%)	18 (17.3%)	13 (12.5%)	21 (20.3%)
The main purpose of psychiatric hospitals is to protect the community from the dangers of the mentally ill people.	13 (12.5%)	2 (1.9%)	11 (10.6%)	9 (8.7%)	11 (10.6%)	17 (16.3%)	41 (39.4%)
If a former mental patient lived nearby, I would not hesitate to allow young children under my care on the sidewalk.	20 (19.2%)	13 (12.5%)	26 (25.0%)	21 (20.2%)	10 (9.6%)	14 (13.5%)	0
Although some mentally ill people may look very good, it is dangerous to forget for a moment that they are mentally ill.	9 (8.7%)	5 (4.8%)	14 (13.5%)	20 (19.2%)	19 (18.3%)	15 (14.4%)	22 (21.2%)
There should be a law forbidding a former mental patient the right to obtain a hunting license.	35 (33.7%)	33 (22.1%)	11 (10.6%)	19 (18.3%)	6 (5.8%)	3 (2.9%)	7 (6.7%)
Total score	Range:11–54, Mean 28.87, Median: 29.00, SD: 10.291						

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the Social Distance Scale scores, and the Dangerousness Scale scores.

Implications for practice, research, and policies

Most anti-stigma interventions and campaigns have been conceptualized using knowledge-attitude-behavior paradigm (18), i.e., experiential learning (learning through reflection on doing), empathy building, interactive and prolonged exposure to anti-stigma content (35, 36).

Further investigations should be done among artists, and if needed, we can provide them with anti-stigma activities and interventions, i.e., workshops, screening films or performing plays about mental disorders, and discussion classes that have been suggested by previous studies for other groups (13–18).

Conclusion

We concluded that all in all, our participants do not have a positive attitude toward patients with severe mental disorders. However, we found no significant correlation between the demographic data, the GHQ-28 scores, the Social Distance Scale scores and the Dangerousness Scale scores, which was probably due to our small sample size. Twenty-five percent of the participants were at risk of moderate to severe anxiety, and 17.3% of the participants were at risk of moderate to severe depression. Our participants' strongest fears were to let patients with severe mental disorders take care of their children, and obtain a hunting license. As reported before, providing knowledge of mental health issues can help the general public to be more tolerant of patients with severe mental disorders. Thus, theater can be employed to fight stigmatizing mental health issues by educating its audience through its creative ways.

Data availability statement

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

Ethics statement

The studies involving human participants were reviewed and approved by the Institutional Review Board of Iran University of Medical Sciences (Reference: IR.IUMS.FMD.REC.1400.362). The patients/participants provided their written informed consent to participate in this study.

Author contributions

Conceptualization and design: NE, ZA, ES, and MS. Data collection: NE, ZA, RA, MB, AA-D, AG, and MS. Data analyses: NE and HM. Initial draft preparation: NE and MS. All authors contributed to the article, editing and review, and approved the submitted version.

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Conflict of interest

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

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A re-evaluation of Stuart's police officer stigma scale: Measuring mental health stigma in first responders

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Stigma about mental illness is often identified as one of the most prominent obstacles to seeking mental health services. This seems to be particularly true among first responders. Unfortunately, the research regarding stigma in first responders is lacking. This may be due, in part, to the absence of appropriate measurement tools to allow such research. Police Officer Stigma Scale (POSS) has recently been developed to address this issue, but its psychometric properties have gone largely untested. Therefore, this study sought to identify the underlying factor structure and internal consistency of the POSS. This paper used a sample of 135 first responders. Using factor analysis with an orthogonal rotation on Stuart's 11-item POSS, the participant's results revealed two main components, accounting for a total of 72.79% of the overall variance. Factor one is "maltreatment of colleagues with a mental disorder," and is associated with six of the 11 items on the scale, such as "Most police officers believe that a colleague who has had a mental illness is not trustworthy." Factor two is "fear of disclosing a mental disorder." It includes items such as "Most police officers would not disclose to a supervisor/manager if they were experiencing a mental illness." Findings from this research are similar to the results of previous studies with components such as unwillingness to disclose a mental health condition, fear of how the public will treat an individual with a mental disorder, and anger toward those who decide to seek treatment or get diagnosed with a mental illness. These findings imply that Stuart's POSS is reliable but needs to include two components rather than one. With the two main components, further research can now be conducted to understand why and ultimately mitigate maltreatment or stigma against first responders with a mental health condition.

KEYWORDS

stigma, mental health stigma, first responders, police, firefighters, self-stigma, public stigma

Introduction

First responders [police, firefighters, emergency medical technicians (EMTs), and military members] perform their duties in extremely stressful circumstances. These stressors include heat, long hours, intense workload (1), and even threat of personal harm or death (2). Therefore, it is not surprising that these employees are at risk for a host of negative outcomes such as depression (3), substance abuse (4), post-traumatic stress disorder (5), and suicide (6).

Although there has been an increase in mental health resources for first responders, many continue not to receive needed care (7). One of the most frequently cited explanations for this problem is stigma toward mental illness. Many first responders fear that they may experience negative career consequences (8). Additionally, there is often a personal set of negative attitudes toward mental illness that might threaten their self-esteem. Since these attitudes often exist in a social climate that values strength and devalues weakness, their effects on help-seeking might be particularly pronounced (9).

The assertion that stigma toward mental illness is prevalent among first responders, and related to the under-utilization of mental health service, is based largely on anecdotal evidence and qualitative data [cf. (10)]. However, the available data do seem compelling. For example, a large survey study by Drew and Martin (11) found that more than 90% of respondents believed that stigma was related to a lack of help-seeking behavior. A meta- analysis by Haugen et al. indicated that an average of 33% of first responders reports some type of stigma belief. In fact, the connection between stigma and help-seeking in this population is so well-accepted that many programs have been created to reduce stigma. Peer support, psychoeducation, and other awareness programs have been especially popular in this regard (12).

Unfortunately, the quantitative research base has not evolved quickly enough to provide substantial guidance in this area. Although there has been a groundswell of interest in stigma toward mental illness, the research is in its relative infancy and there is yet to be a convergence of thinking regarding the theoretical aspects of the phenomena. However, it's generally accepted that stigma toward mental illness is a multi-dimensional construct. Generally speaking, this includes self-focused and an other-focused components (13).

Measurement in this area, consequently, is also emerging. However, as described by Fox et al. (13), many of these measures were developed for one particular study and have not provided sufficient psychometric data to be viewed as valid or generalizable. Furthermore, the proliferation of single-use scales makes it difficult to synthesize results across studies. For example, the current scales include factor structures ranging from one to as many as six. The authors conclude that there is a need not for more scales, but more psychometric research on exiting scales. The present study seeks to respond to that call.

Furthermore, the existing scales were generally developed for broad research into the construct of stigma but were not well-tailored to the specific issue of stigma in the workplace (14). To respond to this problem, Szeto et al. developed the Open Minds Scale for Workplace Attitudes [OMS-WA; (15)]. A series of studies have converged to indicate that this measure might be more appropriate for workplace studies than previous, broader, measures [see Szeto et al. (15) for a review]. They argue that this more precise information is particularly helpful when used to develop interventions to reduce workplace stigma.

Building on this success, researchers suggest that additional benefit might be gained from further tailoring stigma measures to specific, high-risk workplaces (15). For example, this approach has been used effectively to understand stigma issues among healthcare providers (16, 17). This has allowed this profession to develop targeted interventions such as additional training for medical students (16).

Similarly, Stuart (18) developed the *Police Officer Stigma Scale (POSS)* to assess mental health stigma issues in that group of professionals. Stuart based the POSS on Link's (19) Perceived Devaluation and Discrimination Scale (PDDS). The PDSS seeks to assess stigma by asking the participant's perceptions about their peer's beliefs about mental illness. It was believed that this approach might lead to more honest reporting than asking them about their own beliefs. The PDDS has been used in a variety of settings. Studies of its psychometric properties have suggested that it has two underlying factors (20, 21). These factors have been characterized as "perceived acceptance" and "perceived discrimination" (20).

The POSS attempted to translate the PDDS into a scale that is optimal for police officers. The POSS uses five necessary themes for police, including acceptance by others, perceived trustworthiness, employment discrimination, taking opinions less seriously, and treatment as a sign of personal failure. The POSS includes six more themes because they relate to police culture, including disclosing to a colleague, announcing to a supervisor/manager, avoiding seeking help, expectations of discrimination at work in promotions, general expectations of discrimination, and not wanting a supervisor with a mental illness. Item-rest correlations for a single factor solution were all above 0.4, indicating good inter-correlations. The POSS reports a high Cronbach's alpha ($\alpha = 0.82$), implying good reliability (18). However, Stuart (18) did not obtain the two-factor structure from the original PDDS. Rather, she reports that a one-factor solution better fit the data. However, the manuscript does not provide the data required to fully evaluate the underlying factor structure. For that reason, we sought to re-evaluate the POSS factor structure with a different sample. For our sample, we used police, firefighters, and dispatchers to derive sufficient power for a factor analysis. A recent paper by Bowers

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TABLE 1 Demographic characteristics table.

Characteristic	Guided self-help	
	n	%
Gender		
Female	14	13
Male	94	87
Marital status		
Single	26	24
Married/partnered	72	67
Divorced/widowed	9	8
Highest educational level		
Middle school	0	0
High school/some college	4	2.5
University or postgraduate degree	103	97.5

Participants were on average 39.5 years old (SD = 10.1).

et al. reported no difference in stigma between these three groups in a different sample of first responders (22).

Methods

Participants

Participants for this study were 135 first responders that attended a mandatory Mental Health Awareness training session in central Florida. The sessions were delivered throughout the state of Florida in the Fall of 2021. Participants volunteered to participate without renumeration. After consenting, participants completed the measure online before attending the training session. Sixty participants were police officers, 48 were firefighters/EMTs, three were dispatchers. Demographic data about the sample are provided in Table 1.

Data were collected in accordance with the ethical standards of the American Psychological Association. The study was evaluated and approved by the university's Institutional Review Board.

Measures

Stigma toward mental illness was assessed using the Police Officer Stigma Scale POSS, Stuart (18). The POSS is an 11-item scale designed to measure mental health stigma among police officers. Rather than assessing the participant's perception of the general public, the POSS targets beliefs held by fellow officers. The scale was adapted for use with firefighters and dispatchers for the current study (i.e., "Firefighter" was used instead of officer). Participants respond using a 5-point Likert Scale with anchors ranging from "Strongly Agree to Strongly Disagree." The POSS is typically scored by simply summing the responses. However, we used individual item responses for the following analyses. The items are presented in Table 2.

Procedure

Participants completed a pre-test online before attending the session. One hundred and thirty-five participants participated in the training. One hundred and eleven completed at least a portion of the pre-test assessment. The volunteers were debriefed after the training session was complete.

Results

Internal consistency was evaluated for all items in the scale. The analysis yielded an alpha estimate of 0.84. A principal-components factor analysis was then conducted on the 11 items. One hundred and thirty-five first responder sample. This sample size is deemed sufficient for an 11-item scale (23).

Examining the initial eigenvalues (before rotation), one could conclude that two components were extracted from the data. Component one had an eigenvalue of 6.521 and explained 59.278% of the variance. Component two had an eigenvalue of 1.487 and explained 13.516% of the variance with a combined total of 72.794%. Component three gave an eigenvalue of 0.586. According to Field (24), Kaiser's criterion of retaining factors is to discard factors with eigenvalues under one and keep factors with eigenvalues >1. In short, two components were included, and nine were discarded. This factor solution is illustrated in the Scree plot in Figure 1. Interestingly, an identical factor analysis using only the police officers in this sample yielded a very similar two-factor solution. This scree plot is provided in Figure 2.

The modifications made to create the POSS make it impossible to compare the factor loadings with the two-factor solution of the PDDS. However, when one looks at the factor loadings there are clear distinctions between factors one and two. Questions one through five and seven are explained by component two, while questions six, and eight through 11 are explained by factor one. Examining the individual item loadings, factor one seems to best be described as items dealing with perceptions of, while the items that load on Factor two appear to *how others with mental illness are treated* relate to concerns about *disclosing a mental disorder*. This aligns closely with the factor loadings of the original PDDS and the summary model developed by Fox et al. (13).

Discussion

Mental health stigma is considered to be a primary barrier to care among first responders (25). For that reason, there has been a surge of effort to confront and correct stigmatizing beliefs among these workers. Foundational to this effort, however, is the

TABLE 2 Rotated factor loadings by item.

POSS rotated item component matrix Item	Factor 1 "Maltreatment of colleagues with a mental disorder"	Factor 2 "Fear of disclosing a mental disorder"
Most police officers would not disclose to a supervisor/manager if they were experiencing a mental illness.	0.138	0.884
Most police officers would not disclose to a colleague if they were experiencing a mental illness.	0.181	0.823
Most police officers would expect to be discriminated against at work if they disclosed that they were experiencing a mental illness.	0.495	0.667
Most police officers would not want a supervisor/manager who had a mental illness.	0.317	0.733
Most police officers think that being treated for a mental illness is a sign of personal failure.	0.552	0.628
Most police supervisors/managers would not consider an application for promotion from an officer who has had a mental illness.	0.66	0.476
Most police officers would not seek professional help if they were experiencing a mental illness.	0.268	0.789
Most officers would not willingly accept a colleague with a mental illness as a partner.	0.735	0.343
Most police officers would think less of a colleague who has had a mental illness.	0.867	0.301
Once they know a colleague has had a mental illness, most police officers would take their opinions less seriously.	0.857	0.246
Most police officers believe that a colleague who has had a mental illness is not trustworthy.	0.899	0.096

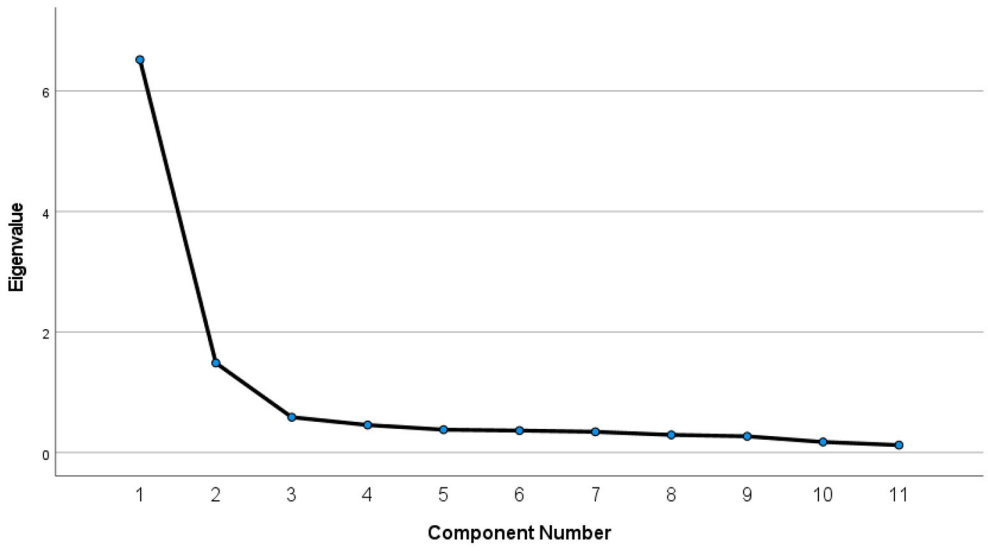

FIGURE 1
Scree plot for entire sample.

ability to assess stigma at these workplaces to understand the nature of the stigma within the organization in order to create optimal interventions. As noted earlier, there is no shortage of available measures of stigma toward mental illness. At this point, the best route for researchers might be to explore the psychometric properties of these measures in hope of identifying sound measures for use in practice (13).

As discussed above, stigma has frequently been conceptualized as a multi-dimensional construct (25, 26). Broadly speaking this can be conceptualized as attitudes toward

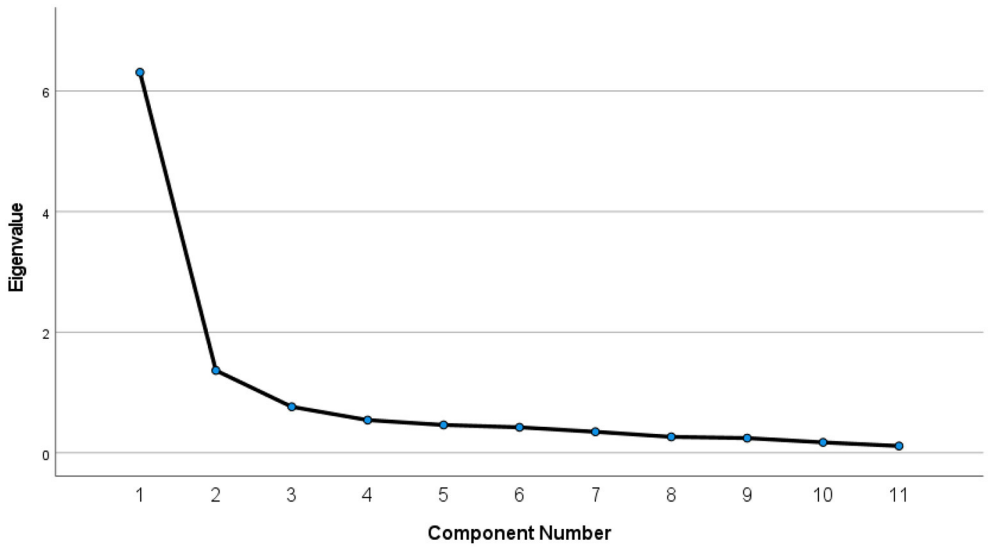

FIGURE 2
Scree plot for police only.

mental illness in others, and attitudes toward mental illness in oneself. These two different sub-types might have different impacts on the organization. Attitudes toward others might influence team performance, trust, and group self-efficacy (27). Additionally, they may influence the quality of one's work when dealing with mentally ill people (28). Conversely, attitudes toward illness in oneself may influence the decision to admit symptoms and seek treatment. Most anti-stigma programs have focused on the latter factor (29), so there might be considerable benefit to addressing the issue of attitudes toward others.

Stuart's (18) POSS is, to the best of our knowledge, the only measure created to assess stigma specifically within first responders. In a first test of this scale, Stuart reported that the measure was best described by a single-factor solution. However, this result is contrary to the current theories of stigma and also to the factor structure of the PDDS, on which the POSS is based. For those reasons we sought to replicate the Stuart study using a different sample of first responders. Our results support a two-factor solution, with one factor apparently focused on perceived maltreatment of others with mental illness, and a second factor related to concerns about disclosing a mental illness.

The two-factor solution aligns well with theoretical models of mental health stigma as a multi-faceted construct. For example, our obtained solution seems to match Haugen et al.'s notion of stigma awareness and stereotype avoidance and Fox et al.'s (13) summary model of the literature. This is important because the validity of the measure is dependent upon the measure's ability to assess the totality of the construct. A one-factor measure does not represent most of the current theories of stigma and may limit our ability to inform interventions optimally. Specifically, it may not reveal whether interventions should be targeted at the individual, the organization, or both. Interestingly, it should be noted that the Open Minds Scale for Healthcare providers yielded a very similar factor structure, lending credence to an underlying two-factor conceptualization of stigma toward the mentally ill (30). However, a variety of scales have been developed for this population and there is not an agreement on the underlying structure [see (31) for a review].

Limitations and future research

It should be noted, however, that the present study is different from the Stuart study in a few ways that might be significant. First, the current results are based on a sample of first responders from one U.S. state while the Stuart study was conducted with Canadian officers. It seems likely that there are cultural differences in mental health stigma (32). Second, the stated goal of the Stuart study was to find a "a simple factor structure where all items loaded on a single factor" (18), while our goal was to find the optimal structure to fit the data. Finally, the present study was based on a sample that included police, firefighters, and dispatchers while Stuart used only police. It is noted, however, that we obtained the same result when using only the police officers in our sample.

The accurate assessment of mental health stigma is a precursor to the development of effective interventions (13, 25). Our goal in this study was to determine whether mental health stigma among first responders is better

assessed as a multi-factor construct. These results suggest that there may be an advantage of using two factors to interpret results of the POSS. Future research should investigate this assertion with a larger, broader sample to replicate these results. Furthermore, a confirmatory factor analysis with a larger, broader, sample is likely to shed even more light on the underlying dimensions of this critical construct.

Conclusion

The proliferation of assessment tools to measure stigma toward mental illness offer tremendous promise for an enhanced understanding of the important concept. However, there is a need to examine the psychometric properties of these scale to ensure their optimum use. The present paper seeks to respond to this challenge by re-examining some of the psychometric properties of the POSS (18). We conclude that this measure might be better used as a two-factor assessment than a single-factor one. In doing so we may provide more detailed guidance to organizations trying to combat mental health stigma.

Data availability statement

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

Ethics statement

The studies involving human participants were reviewed and approved by University of Central Florida. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

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

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COVID-19-related stigma and its relationship with mental wellbeing: A cross-sectional analysis of a cohort study in Japan

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Objective: Social stigma related to coronavirus disease (COVID-19), i. e., COVID-19 stigma, forms a burden on people socially, economically, and mentally. This study assessed COVID-19 stigma using a scale to identify a population likely to exhibit higher prejudice against COVID-19 itself as well as those infected with COVID-19.

Methods: We adapted and modified the Cancer Stigma Scale to assess COVID-19 stigma and used it as the baseline survey of a cohort study in Japan. The questionnaire was disseminated to 1,573 participants (51.7% men) between December 2020 and March 2021. The questionnaire items included the infection status of individuals close to the respondent and their preventive behaviors related to COVID-19, quality of life (QOL; using the EuroQoL 5-Dimension 5-Level [EQ-5D-5L]), and psychological distress (using the 6-item Kessler Psychological Distress Scale [K6]). Exploratory and confirmatory factor analyses were performed to validate the COVID-19 stigma scale, and we further used the structural equation modeling (SEM) to assess the relationship with QOL and psychological distress.

Results: COVID-19 stigma was calculated for the 257 (16.3%) participants who responded to the questionnaire. The mean age (standard deviation) was 54.5 (14.4) years, and 50.2% were men. Factor analysis revealed a five-factor model: Awkwardness (feeling uncomfortable being with a person infected before), Severity (fear of not being able to return to normal after infection), Avoidance (attitude of avoiding infected persons), Policy Opposition (expecting more public funding investment), and Personal Responsibility (believing that infected persons themselves are responsible for their infection). Participants > 70 years had the highest scores among other age groups considering all factors except for Policy Opposition. Standardized coefficients in SEM for COVID-19 stigma (latent variable) was highest for Severity (beta = 0.86). Regression coefficients of COVID-19 stigma on K6 and QOL were 0.21 (95% confidence interval [CI] 0.074–0.342) and −0.159 (95% CI −0.295–0.022), respectively.

Conclusion: People aged ≥ 70 years are more likely to exhibit COVID-19 stigma. Additionally, the results indicate that COVID-19 stigma impacts QOL and psychological distress.

KEYWORDS

COVID-19, social stigma, emerging communicable diseases, quality of life, health communication, population health, vulnerable populations, risk factors

Introduction

Coronavirus Disease (COVID-19) is an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 that spread worldwide in 2020 and was declared a pandemic which is still ongoing (1, 2). As it was novel, no vaccine or evidence-based treatment had been established, and tremendous efforts were required to control and treat the infection. This led to a severe shortage of medical resources in many countries (3). Supplying a vaccine, specific treatment, or evidence-based treatment immediately after an outbreak is difficult, as was the case with past experiences of emerging infections such as the Ebola hemorrhagic fever (Ebola), severe acute respiratory syndrome, and Middle East Respiratory Syndrome. Consequently, an emerging infectious disease outbreak or pandemic induces fear and anxiety concerning infections (4–8). When this negative feeling about infections extends toward people who have been infected, those infected could be ostracized: negatively labeled, stereotyped, discriminated against, and persecuted (9–11). This phenomenon is called "social stigma." Social stigma can be defined as prejudice or discrimination against patients, their families, or healthcare workers; it increases psychosocial burdens, leading to development of psychiatric symptoms such as anxiety and depression, thus decreasing the quality of life (QOL) (11, 12).

During the COVID-19 pandemic, social stigma associated with COVID-19 (COVID-19 stigma) was reported worldwide in early 2020 (5). Healthcare workers in 173 countries have experienced bullying due to COVID-19 stigma (13). In China, which experienced the earliest spread and global convergence of COVID-19, a positive association between COVID-19 stigma toward patients or their families and depressive symptoms and financial burden was reported (14). Research aiming to reduce COVID-19 stigma indicates that communication skills or keeping up with evidence-based information are essential in reducing stigma (15).

In a recent study from Japan, 23% of healthcare professionals reported experiencing COVID-19 stigma since January 2021 (16). In an effort to reduce COVID-19 stigma, public organizations and academic societies took measures such as issuing statements and introducing campaigns to honor healthcare professionals involved in patient care (17). The effectiveness of intervention measures to reduce COVID-19 stigma can be improved *via* a targeting or segmenting approach for the most vulnerable populations (18). For example, a study showed that providing educative content about the correct information regarding Ebola to younger populations through social networking services (SNS) resulted in successful spread of accurate information (19). The part of the population with a higher proportion of internet access showed lower infection rate, indicating that this intervention also contributed to the termination of infection (20). Thus, the target population must be identified and appropriate interventions provided to reduce social stigma, including COVID-19 stigma.

Identifying the target population involves targeting groups that are more likely to exhibit bias. Social stigma is measured for a wide range of diseases. A scale to measure social stigma was developed and validated for various diseases, including infectious diseases, psychological disorders, and cancer (21–23). By the end of March 2022, several studies had reported occurrence of COVID-19 stigma (5, 24, 25); however, no scale that could also measure associated stigma was validated for the Japanese population, and these studies did not focus on population groups more likely to exhibit bias against COVID-19 itself as well as people infected with COVID-19. In this study, we attempted to measure stigma associated with COVID-19 by applying an existing Japanese stigma scale for another disease. We used the Cancer Stigma Scale (CASS) for two reasons: First, the CASS was developed in a non-patient population as was the case for our study; second, since it includes items selected from a previous disease-related stigma scale incorporating Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS), leprosy, mental illness, epilepsy, and skin disease that were identified in a systematic review (21, 22). While the aforementioned disease-specific scale to assess social stigma exists, the reportedly assessed social stigma are similar among these scales, suggesting the need for a generic scale (21). The advantage of applying an existing scale for another disease is that, if successful, it can be potentially utilized for other emerging infectious diseases in the future, and would indicate the possibility of developing a generic scale.

Therefore, in this cross-sectional study, we developed and distributed a questionnaire survey on COVID-19 stigma during the COVID-19 pandemic to identify the population groups more likely to exhibit prejudice against COVID-19 itself and those infected with COVID-19. Furthermore,

we tested our hypothesis that COVID-19 stigma increases psychological distress and decreases QOL in people infected with COVID-19, as indicated in other stigmas (11). Our findings may serve as evidence to show the benefits of visualizing stigma, thereby helping us to take measures for reducing stigma if an emerging infectious disease occurs in the future. Further, identifying the factors associated with stigma would contribute to our understanding of effective intervention methods such as information provision or counseling.

Materials and methods

Study design and participants

This was a cross-sectional study conducted as part of the Kanagawa Prospective "ME-BYO" Cohort Study (ME-BYO cohort) in Japan (26), which is one site of a collaborative genomic cohort study, namely the Japan Multi-Institutional Collaborative Cohort Study (J-MICC Study). Details of the J-MICC Study are described elsewhere (27). In short, the J-MICC Study is being conducted by 13 research groups in 12 prefectures in Japan using a standardized protocol. Apart from common standardized process, each research group is allowed to collect additional data for their own research purposes. At Kanagawa Cancer Center Research Institute (KCC), the baseline recruitment started in 2016 and the baseline survey is still ongoing in 2022. The participants of the ME-BYO cohort were people aged 20–85, and living or working in Kanagawa Prefecture, Japan.

The data were obtained from participants recruited from December 2020 to March 2021, from two sites: the Driver's License Examination Center of Kanagawa Prefecture in Yokohama city and a manufacturing company located in Hiratsuka city, Kanagawa, Japan. Passers-by near the Driver's License Examination Center of Kanagawa Prefecture were asked for voluntary cooperation after providing their informed consent. Registered residents from the Kanagawa prefecture appear at the Center regardless of their residential area in Kanagawa; therefore, the participants were diverse and representative from the whole prefecture to a certain degree. At the second site, employees were sent an invitation to participate in the study along with a request for informed consent. Recruitment was performed in combination with research to clarify the subclinical infection rate in the general population. Thus, persons without a history of COVID-19 were eligible. The history of infection was confirmed by self-report based on whether the participants had ever tested positive by polymerase chain reaction or antigen test for SARS-CoV-2. The timeline of the research is illustrated in Supplementary Figure 1.

A total of 1,573 participants in the ME-BYO cohort were recruited during the above period. Participants were instructed to respond to two questionnaires: (1) a baseline questionnaire for the genomic cohort study, and (2) a questionnaire to clarify the subclinical infection rate in the general population (additional baseline questionnaire); completion of these two questionnaires was mandatory for participation in the study. Furthermore, we also requested that participants fill out an optional web-based questionnaire on stigma related to COVID-19. Age, sex, socioeconomic status (income, education, and job rank), QOL, and psychological distress were obtained from the baseline questionnaire and used to assess the association with the COVID-19 stigma.

Measurements

We measured stigma related to COVID-19 based on the Japanese version of the Cancer Stigma Scale (J-CASS) (28), which is a translated version of the original CASS consisting of 25 items (22). J-CASS was provided by researchers at the Center for Cancer Control and Information Services, National Cancer Center, Japan. The participants of the J-CASS study were selected from the general population with an age range of 20–69 years who could read Japanese (28). The scale comprises 25 items on a 6-point Likert scale (1: Strongly disagree to 6: Strongly agree) along with "not sure," and the score is calculated by averaging the scores obtained. Respondents who answered "not sure" for more than 20% of the total answers (∼30% of respondents) were excluded from the analysis (28). We adapted the CASS according to our hypothesis that we can measure stigma related to COVID-19 by replacing "cancer" with "COVID-19" in the CASS, based on previous research indicating that the underlying concept of stigma scales are common. However, the four items considered cancer-specific and unsuitable for evaluating COVID-19-related stigma simply by replacing the disease name were revised, as shown in Table 1. Furthermore, we added one question to reflect the wellknown phenomenon of intrafamily infection (Table 1). The final scale consisted of 26 items evaluated on a 6-point Likert scale (1 = strongly disagree to 6 = strongly agree), measuring stigma related to COVID-19 in six factors as it is in the CASS: means of the applicable items for Awkwardness, Severity, Avoidance, Policy Opposition, Personal Responsibility, and Financial Discrimination were calculated. We defined each factor as follows: Avoidance is an attitude of avoiding infected persons; Personal Responsibility refers to believing that the infected persons themselves are responsible for their infection; Severity refers to believing that a person cannot return to normal once infected; Policy Opposition is the expectation of more public funding investment for the patient's care; Awkwardness refers to feeling uncomfortable being with a person who had been infected and; Financial Discrimination refers to accepting putting a financial burden on infected people.

Information related to the attitude of the participants toward COVID-19 was obtained from the additional baseline questionnaire (e.g., Was someone close to you [family, colleague,

TABLE 1 List of items that were corrected, other than by replacing the disease name.

Items*	Items in the cancer stigma scale	Items in our study
Avoidance		
Item number 19 appendix	–	If a close friend or family had a COVID-19, I would try to avoid them (even if healed).
Policy opposition		
Item number 22	More government funding should be spent on the care and treatment of those with cancer.	More government funding should be spent on prevention measures against COVID-19.
Item number 23	We have a responsibility to provide the best possible care for people with cancer.	We have a responsibility to follow measures for the prevention of COVID-19.
Financial discrimination		
Item number 20	It is acceptable for banks to refuse to make loans to people with cancer.	It is acceptable to exclude people who had COVID-19 from financial support by the government.
Item number 24	Banks should be allowed to refuse mortgage applications for cancer-related reasons.	It is acceptable to exclude stores or facilities that caused COVID-19 from financial support by the government.

*Item numbers correspond to the item number in the validation paper of J-CASS (22).
J-CASS, Japanese version of the cancer stigma scale.

classmate] infected with COVID-19? Do you think people who had COVID-19 lack morals?).

QOL was evaluated by EQ-5D-5L (EuroQoL 5- Dimension 5-Level) score (29, 30). EQ-5D-5L is a tool to assess health-related QOL in five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), with five levels (no, slight, moderate, severe, and extreme problems). The score ranges from 0 to 1, where 1 indicates full health. Psychological distress was evaluated by the 6-item Kessler Psychological Distress Scale (K6) score, a robust non-specific psychological distress measurement tool (31, 32). K6 score is calculated from 6 items using a 5-Likert scale, with a total score ranging from 0 to 24; a higher score indicates more severe distress. We used a Japanese version of the scale (29, 31) translated and validated from the original scale developed in English (30, 32).

Age was categorized into five categories in the analysis (20–39, 40–49, 50–59, 60–69, and 70 years or older), annual household income was categorized into two groups ($\leq$6, >6 million yen/year [~45 thousand US dollar]), and individual income was categorized into two groups ($\leq$3, >3 million yen/year [~25 thousand US dollar]).

Statistical analysis

All statistical analyses were performed with R (version 4.1.0; R Core Team, Vienna, Austria) (33). The reliability and validity of the COVID-19 stigma were checked in accordance with COnsensus-based Standards for the selection of health Measurement INstruments reporting guideline (34). We conducted a confirmatory factor analysis (CFA) using the cfa function in the R lavaan (version 0.6–9) package using a robust maximum likelihood model with oblique rotation (Promax), as was done in previous studies (22, 28, 35), assuming that stigma related to COVID-19 would have the same structure as the CASS and J-CASS. We included the correlation of the residual errors between items 5 and 8, 10 and 14, 13 and 16, 14 and 15, and 19 and 19a, as these questions had similar wording (refer to Table 2 for the item numbers). We could not include the correlation between items 10 and 11 because this would make the model impossible to identify. The model fit indices were calculated and evaluated with cut-off values to assess the goodness of fit as follows: Standardized Root Mean of the Residual (SRMR) < 0.08, Comparative fit index (CFI) > 0.95, Tucker–Lewis Index (TLI) > 0.95, and Root Mean Square Error of Approximation (RMSEA) < 0.06 (36).

Model fit was insufficient according to the results of the initial CFA (SRMR = 0.053, CFI = 0.897, TLI = 0.880, RMSEA = 0.083), thus, we performed exploratory maximum likelihood factor analysis using the fa function in the R psych (version 2.2.5) package to examine the structure of the scale, to check that the factors confirmed in the CASS are also appropriate for COVID-19 stigma (37). We checked the suitability of the data for structure detection in the factor analysis using the Kaiser-Meyer-Olkin (KMO) sampling adequacy measure and Bartlett's sphericity test using the KMO and cortest.bartlett function in the psych package, respectively (37). We excluded items with low factor loadings (< 0.4). The internal reliability of each factor was evaluated using Cronbach's alpha with a cut-off value of > 0.70, indicating satisfactory internal reliability (38). We could not assess test-retest reliability as the data were collected *via* the cross-sectional baseline survey of the cohort study. We then conducted CFA again according to the result of exploratory factor analysis.

TABLE 2 Explanatory factor analysis of COVID-19 stigma scale.

Items		Factor loadings*
Avoidance		
15	I would find it hard to talk to someone with COVID-19 (AW).	0.98
18	I would distance myself physically from someone with COVID-19.	0.97
19	If a colleague had COVID-19, I would try to avoid them (even if healed).	0.95
14	I would find it difficult being around someone with COVID-19 (AW).	0.93
19a	If a close friend or family had COVID-19, I would try to avoid them (even if healed).	0.85
16	I would feel irritated by someone with COVID-19.	0.81
12	I would try to avoid a person with COVID-19.	0.77
17	I would feel embarrassed discussing COVID-19 with someone who had it.	0.69
13	I would feel angered by someone with COVID-19.	0.66
20	It is acceptable to exclude people who had COVID-19 from financial support by the government. (FD)	0.44
Personal responsibility		
8	A person with COVID-19 is liable for their condition.	0.82
5	A person with COVID-19 is accountable for their condition.	0.65
9	If a person has COVID-19, it is probably their fault.	0.55
3	A person with COVID-19 is to blame for their condition.	0.49
Severity		
7	COVID-19 devastates the lives of those it touches.	0.93
4	Having COVID-19 usually ruins a person's career.	0.88
6	COVID-19 usually ruins close personal relationships.	0.69
1	Once you've had COVID-19, you can never be "normal" again.	0.65
2	Getting COVID-19 means having to mentally prepare oneself for death.	0.50
Policy opposition		
21	The needs of COVID-19 patients should be given top priority. (Reversed)	0.85
22	More government funding should be spent on the prevention measures against COVID-19. (Reversed)	0.74
23	We have a responsibility to follow the prevention measures for the prevention of COVID-19. (Reversed)	0.55
Awkwardness		
11	I would feel comfortable around someone with COVID-19 (Reversed)	0.89
10	I would feel at ease around someone with COVID-19 (Reversed)	0.86
Financial discrimination**		
24	It is acceptable to exclude stores or facilities that caused COVID-19 from financial support by the government.	-
25	It is acceptable for insurance companies to reconsider a policy if someone had COVID-19	-

(AW) items were included in the Awkwardness factor in the cancer stigma scale (CASS), while the (FD) item was included in financial discrimination in the CASS and Japanese version of the CASS.
*The highest factor loading for each item is shown in the relevant factor group. **Financial discrimination factor was excluded from the analysis because all belonging items' factor loading was below 0.40.

In addition, the model was extensively analyzed by SEM using the sem function in the lavaan package, to further test our hypothesis that COVID-19 stigma affects QOL and K6 scores, assuming COVID-19 stigma as a latent variable consisted from the confirmed five factors also as latent variables (35): the factors identified by CFA were used as latent variables consisting of each item as an observed variable, and we assumed the latent variable of COVID-19 stigma using five factors as subscales. QOL and K6 were standardized by arcsine and square root transformation, respectively, using the bestNormalize function in the bestNormalize (version 1.8.2) package (39). The factors identified by factor analysis were used as latent variables consisting of each item as an observed variable, and we assumed the latent variable of COVID-19 stigma using them as subscales. Based on the modification indices, an additional correlation of the residual error between Avoidance and Awkwardness, and QOL and K6 was allowed.

The difference in COVID-19 stigma according to the subgroups of sex, age, socioeconomic status, and groups based on the questionnaire were compared for each factor. Scores of each factor were calculated as a mean of the items that belonged to each factor, and comparison was performed using a Kruskal-Wallis rank sum test, after checking normality using the Shapiro-Wilk test and graphically using the histogram

and quintile-quintile plot. *Post-hoc* analysis was performed using the Bonferroni-corrected Dunn test if the *P*-value of the Kruskal-Wallis test was below 0.05 for the variables with more than three categories.

Ethical approval

All research procedures were approved by the KCC ethics committee (28KEN-36, 2020EKI-79). Written informed consent was obtained from all participants for the ME-BYO cohort and the research to clarify subclinical infection rates in the general population, respectively.

Results

Among the 1,573 participants, 257 (16.3%) answered the questionnaire on stigma related to COVID-19. There were no missing values in the questionnaire. Bar plots showing the proportion of answers to each item are shown in Supplementary Figure 2, and there were no items with extremely skewed responses. The mean age (standard deviation [SD]) was 54.5 (14.4), and 129 participants were male (50.2%). The mean age (SD) in males and females was 56.8 (15.4) and 52.2 (12.9), respectively. Twenty-three participants (11.2%) responded that someone close to them (family member, colleague, or classmate) had been infected with COVID-19.

The model fit indices obtained in the CFA to assess the structural validity were as follows: SRMR = 0.048, CFI = 0.963, TLI = 0.957, RMSEA = 0.053. All four indices met the criteria to assess the goodness of fit. The structure of the model was obtained from the results from the exploratory factor analyses, shown below.

The results of the exploratory factor analysis are shown in Table 2 and Supplementary Table 1. The overall measure of sampling adequacy (KMO index) was 0.91, and the chi-square test statistic was 4,700.6 (p-value < 0.0001) in Bartlett's test of sphericity, indicating the suitability of the data. Factor loadings for two items in Financial Discrimination were below 0.4 (item numbers 24 and 25) and thus excluded from the analysis. As a result, stigma related to COVID-19 was evaluated with five factors, which explained 62.2% of the variance. Factor loading of each item is shown in Table 2. Three items belonged to a different factor in CASS; two items in Awkwardness (item numbers 14 and 15) and one item in Financial Discrimination (item number 20) in the CASS belonged to the Avoidance in COVID-19 stigma. Final scores for each factor and the result of the normality assessment are shown in Figure 1; all factors were non-normally distributed.

The correlation coefficient matrix of the five factors is shown in Table 3. The highest correlation between factors was observed

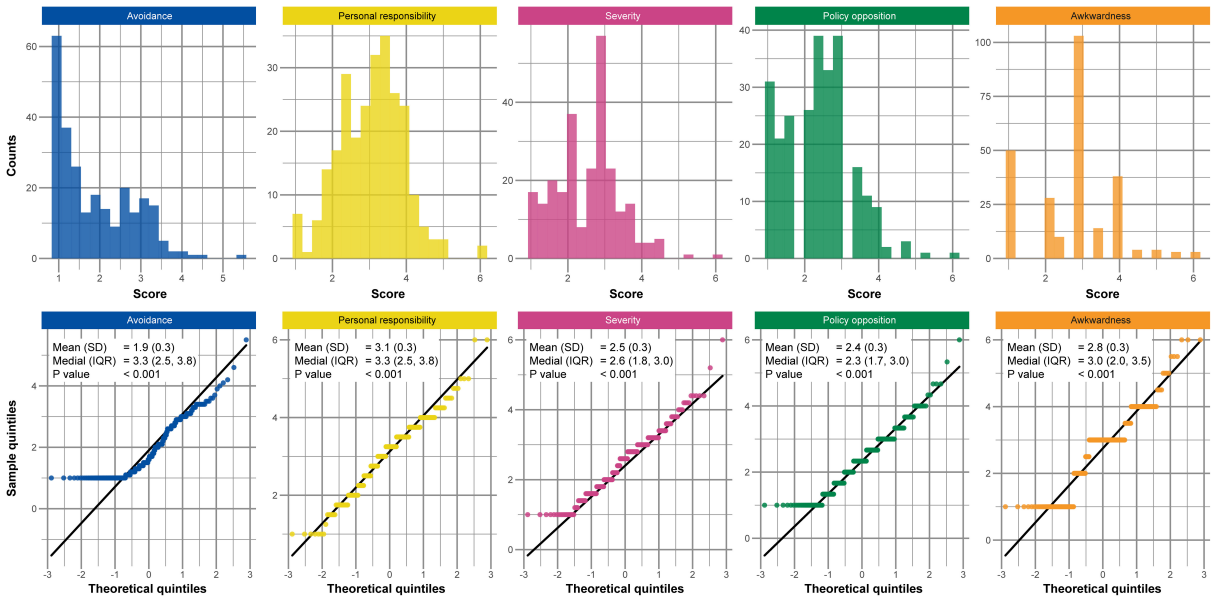

FIGURE 1
Histograms and QQ-plots of the scores for each factor of social stigma related to COVID-19. Definitions of each factor are as follows: avoidance is an attitude of avoiding the patient; personal responsibility is to anticipate that the infected persons themselves are responsible for their infection; severity is to anticipate that you could not return to normal again once infected; policy opposition is to expect more public funding investment for patients' care; awkwardness is an attitude of feeling uncomfortable being with a person who had the infection before. the p-values were calculated using the Shapiro-Wilk test. SD; standard deviation, IQR; inter-quartile range, QQ; quintile-quintile, COVID-19; coronavirus disease.

TABLE 3 Correlation coefficient matrix and internal consistency of each factor.

Factors	F1	F2	F3	F4	F5	Total
Correlation						
F1: Avoidance	1.00					
F2: Personal Responsibility	0.11	1.00				
F3: Severity	−0.51	−0.004	1.00			
F4: Policy opposition	0.52	0.05	−0.23	1.00		
F5: Awkwardness	0.67	−0.07	−0.34	0.50	1.00	
Internal consistency*	0.95 (0.94–0.96)	0.75 (0.70–0.80)	0.85 (0.82–0.88)	0.74 (0.69–0.80)	0.95 (0.94–0.96)	0.92 (0.91–0.94)

*Cronbach's alpha. The numbers in the parenthesis show the 95% confidence interval.

for Avoidance and Awkwardness ($r = 0.67$). Cronbach's alpha for the total scale and each factor are also shown in Table 3, and all values met the criteria.

The result of the SEM is shown in Figure 2. Highest standardized coefficient for the COVID-19 stigma (latent variable) was Severity (beta = 0.86). Regression coefficients of K6 and EQ-5D-5L on COVID-19 stigma were 0.21 (95% CI 0.074–0.342) and −0.159 (95% CI −0.295–−0.022). Other details of the results are shown in Supplementary Table 2. Model fit indices for the SEM were as follows; SRMR = 0.055, CFI = 0.956, TLI = 0.951, RMSEA = 0.053.

Table 4 shows the results of the Kruskal-Wallis test. In Policy Opposition and Awkwardness, *p*-value for the mean difference in age was below the cut-off of 0.05. Avoidance in people aged 70 years or older also seemed to be high, although *p*-value was above the cut-off. *Post-hoc* analysis indicated that scores for Policy Opposition in people aged 20–39 years old were higher from those of 60–69 years old (*p*-value = 0.037), and score for Awkwardness in people aged ≥ 70 years were higher from those of 20–39 years old (*p*-value = 0.026), 40–49 years old (*p*-value = 0.005), and 50–59 years old (*p*-value = 0.035). The median score (inter-quartile range) for Severity in males was 2.40 (1.60, 3.00), and 2.80 (2.00, 3.20) in females (*p*-value = 0.006). COVID-19 stigma score was higher for those who felt anxiety regarding the transmission or spread of COVID-19 and those who did not, especially for Avoidance and Severity (*p*-value < 0.001). The score for Awkwardness was higher in people who answered that they do not understand risky behaviors that are likely to lead to the transmission or spread of COVID-19 (*p*-value = 0.028).

Discussion

This is the first study to elucidate the characteristics of population groups prone to stigma and factors associated with the stigma, using data collected during the COVID-19 pandemic. The results suggest that individuals aged ≥70 years more likely to exhibit COVID-19 stigma. In addition, COVID-19 stigma was shown to be associated with QOL and psychological distress, even in uninfected individuals.

Factor analysis indicated that COVID-19 stigma consists of five factors: Avoidance, Personal Responsibility, Severity, Policy Opposition, and Awkwardness. These results highlighted the internal consistency and structural validity of the scale; however, we could not assess the reliability and measurement error. These results are consistent with the CASS, except for Financial Discrimination which was not evident for COVID-19 stigma. As restrictions due to the COVID-19 and the economic burden caused were practically equivalent among populations, many people might have perceived that financial support is decisive, reducing the factor loading for Financial Discrimination in the factor analysis (Table 2).

COVID-19 stigma score for Avoidance and Awkwardness was higher for individuals aged ≥ 70 years. COVID-19 patients older than 70 years old are at risk for severe illness (1, 3, 40). Age and other risk factors such as underlying medical conditions are known to be associated with severe outcomes or death (40, 41). In addition, concerns about unrecognized transmission from the pre- or pauci-symptomatic patients were especially strong among higher risk people, due to difficulty in preventing such infections (17). Higher scores in Avoidance and Awkwardness in individuals over 70 could be a result reflective of the above aspects. In addition, association between age and stigma related to other diseases, such as HIV/AIDS, and age itself, cause prejudice known as ageism (42). However, we were unable to distinguish the association between age and other risk factors of the disease that might correlate with age, as age was always an alternate endpoint. Disease risk of COVID-19 was increased for higher ages. Nevertheless, in future emerging infectious diseases where younger age is associated with higher risk, stigma score might not be associated with age, but instead with other risk factors associated with the disease.

Among the five factors of COVID-19 stigma, the distribution of the score was different in Policy Opposition which consisted of items related to public funding (Table 4). The score for Policy Opposition was higher in younger individuals, who might be hesitant to put public funding, such as loan

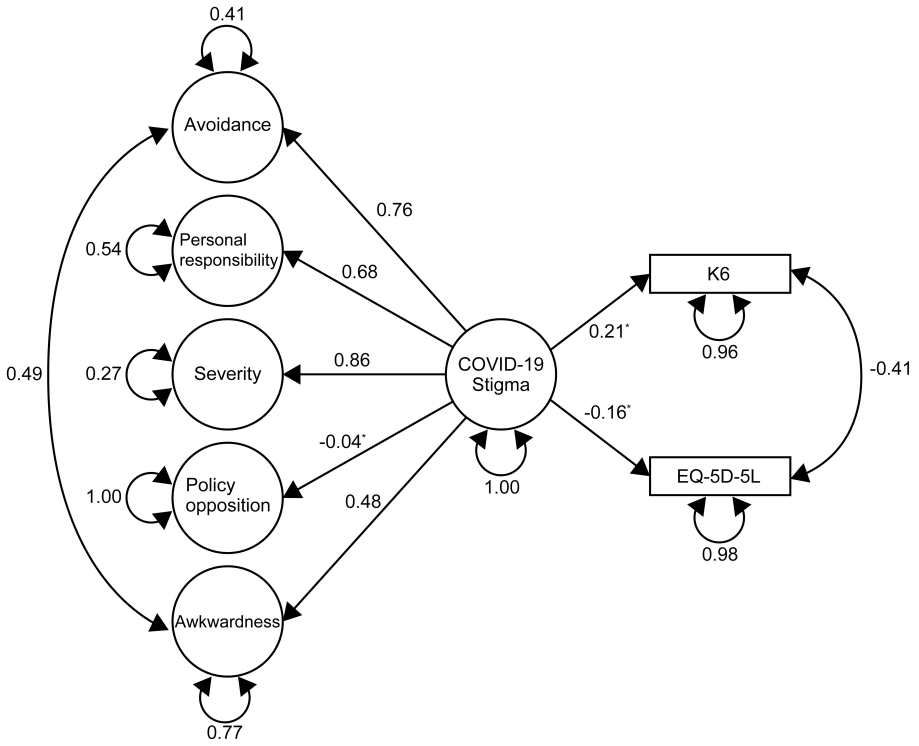

FIGURE 2
Path diagram and results of the structural equation modeling. Values next to each path indicate the standardized estimates. The double-headed curved arrows indicate the correlation of residual errors between the variables. The circular curved arrows represent the variance of error. Standardized Root Mean of the Residual = 0.055, Comparative fit index = 0.956, Tucker–Lewis Index = 0.951, Root Mean Square Error of Approximation= 0.053. *The *p*-values were < 0.0001 for all estimates except for Policy Opposition (*P* = 0.593), EQ-5D-5L (*P* = 0.023), and K6 (*P* = 0.002). COVID-19 stigma; social stigma related to the coronavirus disease, K6; 6-item Kessler Psychological Distress Scale, EQ-5D-5L; EuroQoL 5- Dimension 5-Level. COVID-19 stigma scale scores for each factor according to each characteristic subgroup. The values indicate the median (interquartile range). COVID-19; coronavirus disease 2019.

system, support funding, or financial aid, into the economic and social consequences caused by COVID-19 (43). In Japan, social security expenses continue to increase due to the declining birthrate and aging population, resulting in an imbalance in benefits and burden between generations (44, 45). The heaviest burden is placed on citizens who recently joined the workforce and hence begun paying taxes and those struggling to make ends meet due to childbirth and childcare (44, 45). This may explain why the score for Policy Opposition was higher in younger people likely to be uncompromising about the usage of public funds consisting of taxes.

Severity had the biggest effect on COVID-19 stigma (Figure 2), suggesting that anxiety and fear surrounding the consequences caused by getting infected is a crucial component of COVID-19 stigma. Severity is based on a dreadful image of the disease and society's attitudes, along with the assumption that life will be disrupted by COVID-19 (Table 2). During the pandemic, there has been an abundance of information regarding clusters, the prognosis of critically ill patients, individuals suffering from the aftereffects and economically, and fake news that cause insecurity, all of which have exacerbated Severity (17, 46). Thus, to reduce Severity, it is crucial to assure and show that one can return to social life once recovered. To achieve this, we propose providing opportunities, especially to populations exhibiting more bias such as individuals aged ≥70 years, to promote active communication with a person who experienced COVID-19 and returned to their normal life. Being in contact with a person who had been infected is more effective than just an educational intervention (19, 47). However, indicating an optimal educational intervention was difficult within this study, and therefore further research is required.

Differences in COVID-19 stigma were observed between participants who felt anxiety associated with infection and spread of COVID-19 and who did not (Table 4). Associated *p*-values were comparatively higher for Awkwardness, while the Awkwardness score was higher for participants who answered that they did not understand the risky behaviors that are likely to lead to the transmission or spread of COVID-19. Thus, the COVID-19 stigma scored in this study did not just reflect the disinterest of participants but was associated with

TABLE 4 COVID-19 stigma scale scores for each factor according to each characteristic subgroup.

	n	Avoidance	Personal responsibility	Severity	Policy opposition	Awkwardness
Sex						
Male	129	1.50 (1.00, 2.60)	3.25 (2.50, 3.50)	2.40 (1.60, 3.00)	2.33 (1.67, 3.00)	3.00 (2.00, 3.00)
Female	128	1.65 (1.10, 2.70)	3.25 (2.75, 3.75)	2.80 (2.00, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 3.50)
p-value		0.465	0.086	0.006*	0.846	0.408
Age group (years)						
20–39	43	1.80 (1.15, 2.65)	3.50 (2.62, 3.75)	2.80 (2.00, 3.00)	2.67 (2.33, 3.17)	3.00 (2.00, 3.00)
40–49	48	1.40 (1.00, 2.22)	3.12 (2.50, 3.75)	2.80 (1.60, 3.20)	2.33 (1.67, 3.00)	3.00 (1.00, 3.00)
50–59	76	1.50 (1.00, 2.70)	3.25 (2.75, 3.75)	2.70 (1.80, 3.05)	2.33 (1.67, 3.00)	3.00 (2.00, 3.50)
60–69	51	1.50 (1.15, 2.10)	3.00 (2.50, 3.50)	2.40 (2.00, 3.00)	2.33 (1.50, 2.83)	3.00 (2.00, 3.00)
70–85	39	2.10 (1.35, 3.00)	3.25 (2.38, 3.75)	2.60 (1.70, 3.20)	2.33 (1.50, 3.00)	3.00 (3.00, 4.00)
p-value		0.064	0.282	0.974	0.041*	0.007*
Annual household income						
≤ 6 million yen	135	1.50 (1.10, 2.30)	3.00 (2.50, 3.50)	2.60 (1.80, 3.00)	2.33 (1.67, 3.00)	3.00 (2.50, 3.00)
> 6 million yen	109	1.60 (1.00, 2.70)	3.25 (2.25, 3.75)	2.60 (1.80, 3.20)	2.33 (1.67, 3.00)	3.00 (1.00, 3.50)
p-value		0.750	0.573	0.584	0.470	0.098
Individual income						
≤ 3 million yen	131	1.50 (1.10, 2.60)	3.25 (2.50, 3.75)	2.80 (2.00, 3.00)	2.33 (1.67, 3.00)	3.00 (2.00, 3.00)
> 3 million yen	121	1.70 (1.10, 2.70)	3.25 (2.50, 3.75)	2.40 (1.60, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 3.50)
p-value		0.718	0.894	0.110	0.395	0.779
Education						
High school graduate or earlier	50	1.40 (1.10, 2.10)	3.25 (2.56, 3.50)	2.50 (1.80, 3.00)	2.33 (1.67, 3.00)	3.00 (2.62, 3.38)
Junior college/technical school graduate	72	2.00 (1.10, 2.75)	3.25 (2.75, 3.81)	2.80 (2.00, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 3.50)
University/graduate school graduate	134	1.70 (1.00, 2.68)	3.25 (2.50, 3.75)	2.60 (1.85, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 3.38)
p-value		0.199	0.240	0.375	0.859	0.467
Job rank						
Manager	22	1.20 (1.00, 1.65)	2.75 (2.25, 3.50)	1.80 (1.20, 2.60)	2.33 (1.33, 3.50)	2.25 (1.00, 3.00)
Permanent employee	82	1.70 (1.02, 2.70)	3.25 (2.50, 3.75)	2.60 (1.80, 3.20)	2.33 (1.75, 3.00)	3.00 (2.00, 3.00)
Public officers	15	1.50 (1.20, 2.05)	3.50 (3.00, 3.75)	2.40 (1.90, 2.90)	2.33 (1.83, 3.00)	3.00 (1.50, 3.00)
Contractor/temporary	20	1.90 (1.28, 3.40)	3.12 (2.25, 4.00)	2.80 (1.95, 3.20)	2.50 (1.33, 3.00)	3.25 (2.75, 4.00)
Part-time	41	1.60 (1.20, 2.30)	3.25 (2.75, 3.75)	2.80 (2.00, 3.00)	2.33 (1.33, 3.00)	3.00 (2.00, 3.50)
Homemaker	24	2.05 (1.00, 2.82)	3.25 (2.75, 3.75)	2.70 (2.20, 3.05)	2.33 (1.92, 2.75)	3.00 (1.75, 3.00)
Retired	18	1.75 (1.05, 2.90)	2.88 (1.69, 3.50)	2.60 (1.70, 3.20)	2.17 (1.08, 3.00)	3.00 (2.62, 4.00)
Students	4	1.95 (1.25, 2.65)	3.50 (3.06, 3.50)	2.80 (2.40, 3.15)	3.00 (2.83, 3.25)	3.00 (2.75, 3.12)
p-value		0.513	0.442	0.136	0.626	0.056
COVID-19 in someone close (family, colleague, schoolmate)						
No	234	1.70 (1.10, 2.70)	3.25 (2.50, 3.75)	2.60 (1.80, 3.00)	2.33 (1.67, 3.00)	3.00 (2.00, 3.50)
Yes	23	1.40 (1.05, 2.05)	3.25 (2.12, 3.62)	2.60 (1.80, 3.20)	2.67 (2.33, 3.00)	3.00 (2.00, 3.00)
p-value		0.287	0.610	0.834	0.049*	0.288
People who had COVID-19 lack morals						
No	214	1.60 (1.00, 2.60)	3.25 (2.31, 3.50)	2.60 (1.80, 3.00)	2.33 (1.67, 3.00)	3.00 (2.00, 3.00)
Yes	43	1.70 (1.20, 3.00)	3.50 (2.88, 4.00)	2.80 (1.90, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 4.00)
p-value		0.106	0.007*	0.433	0.993	0.155

(Continued)

TABLE 4 (Continued)

	n	Avoidance	Personal responsibility	Severity	Policy opposition	Awkwardness
People who had COVID-19 lack common sense						
No	231	1.60 (1.10, 2.70)	3.25 (2.50, 3.75)	2.60 (1.80, 3.10)	2.33 (1.67, 3.00)	3.00 (2.00, 3.25)
Yes	26	1.55 (1.12, 2.58)	3.50 (3.06, 4.00)	2.60 (1.80, 3.00)	2.00 (1.67, 2.67)	3.00 (2.62, 3.50)
p-value		0.945	0.034*	0.714	0.184	0.366
Do you understand risky behaviors that are likely to lead to the transmission or spread of COVID-19?						
No	41	1.60 (1.10, 2.70)	3.25 (2.50, 4.00)	2.80 (1.80, 3.00)	2.33 (1.67, 3.00)	3.00 (2.50, 4.00)
Yes	216	1.60 (1.00, 2.62)	3.25 (2.50, 3.75)	2.60 (1.80, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 3.00)
p-value		0.586	0.206	0.682	0.902	0.028*
Are you taking action to prevent the transmission and spread of COVID-19 every day?						
No	23	1.80 (1.00, 2.55)	3.50 (2.50, 3.75)	2.60 (2.20, 2.80)	2.33 (1.83, 3.17)	3.00 (1.50, 3.00)
Yes	234	1.60 (1.10, 2.68)	3.25 (2.50, 3.75)	2.60 (1.80, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 3.50)
p-value		0.742	0.256	0.644	0.392	0.302
Do you feel anxiety associated with the transmission or spread of COVID-19?						
No	37	1.10 (1.00, 1.50)	2.50 (1.75, 3.50)	1.80 (1.40, 2.20)	3.00 (2.00, 4.00)	2.50 (1.00, 3.00)
Yes	220	1.80 (1.10, 2.70)	3.25 (2.75, 3.75)	2.80 (2.00, 3.20)	2.33 (1.67, 3.00)	3.00 (2.00, 3.50)
p-value		<0.001*	0.005*	<0.001*	0.001*	0.030*

The values indicate the median (interquartile range). COVID-19; coronavirus disease.
*These p-values were below the cut-off of 0.05.

anxiety and lack of knowledge. Taken together, individuals whose Awkwardness score is high would be candidates for an intervention aiming to expand their knowledge, and as noted above, people with a high Severity score could be candidates for an intervention aiming to taper their anxiety. Furthermore, COVID-19 stigma was shown to have a negative effect on QOL and psychological distress (Table 4; Figure 2). The interventions aiming to reduce Awkwardness and Severity could also contribute to improvements in QOL and psychological distress. There have been an increasing number of suicides associated with the COVID-19 pandemic (43, 48). Intervention aiming to reduce the COVID-19 stigma may also contribute to suicide prevention by the ripple effect on QOL and mental status.

The current approach to reduce COVID-19 stigma was undertaken by disseminating a message asking for an end to discrimination and prejudice against people infected with COVID-19 without targeting a specific population (10). We assume that the high-risk approach, rather than the population approach taken currently, would have merit on the strategy to reduce the social stigma including the COVID-19 stigma as well as lifestyle related diseases (9, 49). According to the results of this study, priority targets for an efficient intervention would be individuals older than 70 years, who have a higher chance of exhibiting more bias toward people infected by COVID-19. Also, the Severity score was slightly higher in females than males; the difference in median was 0.40 points (p-value = 0.006). Thus, females may be more apprehensive about getting infected, although the absolute difference and the strength of evidence were small. However, the incidence of depression in females is twice as high as in males due to stress caused by life events, partly due to biological differences between sexes (50). Higher scores for Severity in females may result from females being more apprehensive about the diverse disruption caused by the COVID-19 pandemic.

Limitations

This study has some limitations. First, the scale used to measure the COVID-19 stigma was not validated in advance. Developing and validating a new scale for the COVID-19 stigma takes time, and thus we attempted to measure COVID-19 stigma using a validated stigma scale in Japanese for cancer (J-CASS) by changing the disease name (22, 28). Nevertheless, our findings demonstrated that the validity measures of the score were satisfactory, suggesting that the scale could be perceived as indicating COVID-19 stigma. Meanwhile, as the study was

undertaken in conjunction with a baseline survey of a cohort study, the analysis was cross-sectional which also limited us to assess the reliability of the stigma scale. Moreover, as responding to the survey regarding COVID-19 stigma was optional, only 16.3% of the target population responded and the results are biased by selection. In addition, because our study participants were limited to people aged 20–85, our study population was ∼7 years higher in age compared to the general population, which indicates the existence of a selection bias. Therefore, the results cannot be generalized to people outside this range.

Suggestions for future studies

We intend to further assess the relationship between COVID-19 stigma and mental wellbeing, particularly the opposite relationship and degree of impact on QOL and psychological stress from COVID-19 stigma. With regards to measurements, since COVID-19 is a wellknown infectious disease which triggered a global pandemic, our approach for measuring disease-related stigma needs to be validated in other diseases, such as rare diseases or infectious diseases with lower infectious capability for generalizability. Lastly, future studies to elucidate an optimal intervention aiming to ameliorate stigma are required. For example, we could conduct a study to evaluate the effects of an intervention such as those which provide an opportunity to communicate with a person who has experienced COVID-19 in the population exhibiting more stigma.

Conclusion

Older individuals, who exhibit a higher risk of getting infected with COVID-19, are likely to exhibit greater prejudice against COVID-19. Furthermore, COVID-19 stigma was shown to have a negative effect on QOL and psychological distress even for uninfected populations.

Data availability statement

Data cannot be shared publicly due to ethical restrictions. Data described in the manuscript will be made available upon application and approval from the ME-BYO cohort office (contact via the corresponding author) for researchers who meet the criteria for data sharing.

Ethics statement

The studies involving human participants were reviewed and approved by Kanagawa Cancer Center. The patients/participants provided their written informed consent to participate in this study.

Author contributions

ES and SN conceptualized and designed the research and wrote the first draft of the manuscript.. SN and HN designed the ME-BYO cohort. SN, KW, HI, NS, YS, and HN conducted the ME-BYO cohort and provided data. SN was responsible for data curation and data analysis. KW, KT, and HN were involved in interpretation of results. All authors read and approved the final manuscript.

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Conflict of interest

Authors HI and NS are members of Hygeia Communication General Incorporated Association.

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

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2022.1010720/full#supplementary-material

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Assessment of psychometric properties of the self-stigma inventory for Iranian families of persons who use drugs

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Background: Substance use disorder (SUD) and its related problems take a toll on the individual, family, and society. This study was conducted to determine the psychometric properties of the self-stigma scale in the families of persons who use drugs (PWUDs) in Iran.

Methods: This was a methodological and psychometric study. The study population consisted of 311 family members of PWUDs visiting outpatient and inpatient addiction treatment centers in Kermanshah who were selected using convenience sampling. The 14-item Self-Stigma Inventory for Families (SSI-F), which was developed by Yildiz et al. in 2019 using interviews and scales connected with stigma, was applied. The ten steps developed by Wilde et al. were used in this study for cultural validation. The exploratory factor analysis (EFA) (140 samples) and confirmatory factor analysis (CFA) (311 subjects) were used to confirm the construct validity, and the test-retest method was used to confirm the reliability of the tools. Cronbach's alpha was also used to test the internal consistency of the tools.

Findings: The results of EFA and CFA scales in families of PWUDs were confirmed with three factors and 14 items. The reliability degree of the tools was confirmed as 0.891 and the Cronbach's alpha was confirmed as 0.879 using the test-retest method. Pearson's correlation coefficient indicated a positive and significant status between the scale's items/factors and the scale itself.

Conclusion: Generally, the results showed that the PWUDs SSI-F scale in Iranian families was valid and reliable with three factors and 14 items, and it can be used to conduct relevant studies.

KEYWORDS

reliability, validity, stigma, drug user, family, substance use disorder

Introduction

Stigma is a set of negative beliefs held by a particular group or society about a particular subject or people (1). Stigma is rarely based on facts, but it is mainly based on assumptions and generalities (2). It can lead to prejudice, avoidance, rejection, and discrimination against people having undesirable social qualities or marginal cultural behaviors like substance abuse (3). Self-stigma is a gradual process where a person assumes the same negative attitude toward some qualities without criticizing the negative social prejudices against those qualities (4). The results of the study indicate a public negative attitude toward people taking drugs which is even more negative than the attitude toward people suffering from schizophrenia (5).

The stigma of taking drugs is one of the greatest obstacles for people who seek treatment and are being treated for substance abuse disorders (6). The variables of mental health (the temptation to use drugs, depression, anxiety, and life quality) in connection with persons who use drugs (PWUDs) have the strongest relationship with self-stigma (7). Although there are a number of stigmas attached to PWUDs, all people dealing with substance abuse do not experience the same number of stigmas (8). The results of the study conducted by Stringer showed that married parents suffer from the highest level of self-stigma, and the family member of PWUDs suffer from the greatest mental pressure exerted by stigma (9). Stigma is attached to families of PWUDs through interaction with neighbors, extended family, and also healthcare personnel. The inappropriate attitude of relatives, neighbors, and other people in society toward PWUDs is the main factor involved in the attachment of stigma to the families and PWUDs (10).

Generally, healthcare experts hold a negative attitude toward PWUDs (11). They consider violence, manipulation, and low motivation as the factors preventing the provision of treatment services to these patients (9, 11). Attaching stigma to PWUDs is a prevalent phenomenon that has destructive effects on the treatment results, healthcare staff, treatments, research, policies, and society in general (2). The negative attitude of healthcare experts decreases the power to rehabilitate patients and weakens treatment results (11). The results of the studies have indicated the willingness of the families and PWUDs to form supportive relationships with other people and to cooperate in treatment and caretaking (12). Therefore, it is necessary to plan and implement appropriate actions to improve the interaction of help-seekers' families with other people, society, and healthcare personnel by measuring the degree of perceived stigma and self-stigma in these families (13). Concerning the measurement of the degree of stigma in people suffering from mental illnesses and their families (14–16), PWUDs (17) were introduced. However, a standard tool, which is both valid and reliable, to evaluate self-stigma in families of PWUDs in Iran should be prepared and used for education, as well as healthcare and treatment programs. Families of the patients with schizophrenia (Self-Stigma Inventory for Families [SSI-F]) scale has been developed in 2019 by Yildiz et al. with the same purpose, which includes 14 questions and 3 factors (social withdrawal, concealment, and low validity) (16). Considering that substance use disorders (SUDs) are subcategories of mental and behavioral disorders, and also by examining the items of the abovementioned tool, it is clear that due to Turkey's proximity to Iran, the items are very close to the norms and culture in Iran. Therefore, this questionnaire can be an appropriate tool to evaluate self-stigma in families of PWUDs. This study was conducted to determine the psychometrics of the stigma questionnaire in families of PWUDs in Iran.

Abbreviations: CVI, Content Validity Index; CVR, Content Validity Ratio; KMO, Kaiser Meyer Olkin; EFA, Exploratory factor analysis; CFA, Confirmatory Factor Analysis; TLI, Tucker-Lewis Index; NFI, Normed Fit Index; GFI, Goodness of Fit Index; RMSEA, Root Mean Square Error of Approximation; PC, Principal Components; SRMR, Standardized Root Mean Square Residual; SUD, Substance use disorder; PWUDs, Person Who Uses Drugs; SSI-F, Self-Stigma Inventory for Families; KUMS, Kermanshah University of Medical Sciences.

Materials and methods

Design and setting

This was a methodological and validation study. The study population consisted of the family members of PWUDs visiting the addiction treatment centers in Kermanshah. In total, 22 private and public substance abuse treatment centers in Kermanshah city were selected. The research units were also selected from the family members of patients undergoing maintenance treatment with methadone in the clinics who had a history of using natural drugs such as opium, heroin, and crack.

Participants

In total, 311 (18) subjects were selected using convenience sampling and according to the inclusion criteria among the blood relatives (children, parents, and peers) of PWUDs who visited the private or public addiction treatment centers in Kermanshah.

Participant's selection method

The sample size in the validity stage of the construct [exploratory factor analysis (EFA) = 140] in confirmatory factor

TABLE 1 The ratio and index of content validity, and multivariate normality index of the tool items.

		Skewness[d]	Kurtosis[c]	CVI[b]	CVR[a]
1	I think people are worried that I may lose my control since I am a family member of a PWUD.	0.19	−1.23	0.92	0.83
2	I try to avoid individuals who may hurt me by their opinions and words since I am a family member of a PWUD.	0.16	−1.31	0.92	0.66
3	I think people do not care about me, because I am a family member of a PWUD.	−0.02	−1.23	0.83	0.66
4	I think I am a burden on others, because I am a family member of a PWUD.	0.18	−1.24	0.83	0.83
5	I think I cannot make right decisions, because I am a family member of a PWUD.	0.18	−1.25	0.92	0.83
6	Since I think that others do not understand me, I tend to avoid them, because I am a family member of a PWUD.	0.09	−1.28	0.92	0.66
7	I do not tell others what the actual name of my kin's disease is, because I am afraid that they might desert me.	0.19	−1.25	0.92	0.83
8	I do not tell my relatives what the actual name of my kin's SUD is.	0.14	−1.33	0.92	0.83
9	I do not tell my friends that one of my family members has a SUD	0.01	−1.34	0.83	0.83
10	I feel less self–esteem since I have started to live with a PWUD	0.15	−1.32	0.83	1
11	I feel useless as I am part of a family with a PWUD.	0.19	−1.26	0.92	0.66
12	I think I cannot be a successful person, because I am a family member of a PWUD.	0.23	−1.26	1	0.66
13	I think I cannot be happy, because I am a family member of a PWUD.	0.28	−1.19	0.92	1
14	I cannot be as responsible as others, because I am a family member of a PWUD.	0.20	−1.28	1	0.66
	SSI–F (PWUDs)			0.91	0.78
			Mardia test = 126.36		

[a]Content Validity Ratio, [b]Content Validity Index, [c]Skewness is a measure of symmetry, or more precisely, the lack of symmetry, [d]Kurtosis is a measure of whether the data are heavy–tailed or light–tailed relative to a normal distribution.

analysis (CFA) and the reliability of 311 subjects were used (18, 19). Being an immediate family member of PWUD, having an interest in participation, and having an age of 18–54 years were considered the inclusion criteria while completing < 90% of the questionnaire was considered an exclusion criterion in this study.

Research instrument

The demographic form of the patients and their family members who participated in the study and the SSI-F were the main tools used in the study.

Self-stigma inventory for families

The 14-item SSI-F developed by interviews and scales connected with stigma in 2019 evaluates self-stigma in the families of people having mental illnesses. This scale was designed using focus group interviews and the study of existing scales. Initially, it had 19 items that were validated in Turkish society and then reduced to 14 items. The scale was designed based on a Likert scale, and each item included five options, namely, (1) not agree, (2) slightly agree, (3) somewhat agree, (4) generally agree, and (5) completely agree. The SSI-F has a Cronbach's alpha that equals 0.88 and a reliability coefficient that equals 0.93 based on the test-retest method in Turkish society (16).

Cultural validation

After obtaining permission from the designer of the tools, the ten steps proposed by Wild were used to translate and validate the tools culturally (20).

- Step 1: Key native people (proficiency in English-Farsi, Iran residency, and previous experience of translating texts into the mentioned languages) were selected to render translations.
- Step 2: Separate translation of the SSI-F scale to Farsi by two individuals.
- Step 3: Holding a panel consisting of the research team and a combination of two initial Farsi translations into one single translation. At this stage, the schizophrenia disorder in the subjects was changed to SUD.
- Step 4: Returning the final version translated from Farsi into the original language of the tools by two translators independent of the second step translators.

10.3389/fpubh.2022.1017273

TABLE 2 Demographic characteristics of the study participants.

Variable		EFA (140) *N* (%)	CFA (311) *N* (%)
Gender	Male	133(95)	299(96.1)
(PWUDs)	Female	7(5)	12(3.9)
Gender	Male	84(60)	137(38.6)
(Family member)	Female	56(40)	218(61.4)
Marital status	Married	78(55.7)	159(51.1)
(Family member)	Single	62(44.3)	152(48.9)
Educational level	Elementary level	13(9.3)	36(11.6)
(Family member)	Secondary level	25(17.9)	57(18.3)
	High school diploma	81(57.9)	154(49.5)
	Higher education	21(15)	64(20.6)
Domicile	City	89(63.9)	205(65.9)
(Family member)	Suburb	48(34.3)	99(31.8)
	Rural area	3(2.1)	7(2.3)
Job	Unemployed	29(20.7)	58(18.6)
(Family member)	Employed	38(27.1)	86(27.7)
	Manual worker	27(19.3)	60(19.3)
	Freelancer	27(19.3)	40(12.9)
	House wife	19(13.6)	67(21.5)
Relation of PWUD	Spouse	14(10)	32(10.3)
	Children	25(17.9)	73(23.5)
	Brother	40(28.6)	91(29.3)
	Sister	35(25)	62(19.9)
	Parents	26(18.6)	53(17)
Drug use duration	< 1 year	16(11.4)	
(PWUDs)	1–3 years	24(17.1)	
	3–5 years	25(17.9)	
	More than 5 years	75(53.6)	

TABLE 3 Extracted eigenvalues for each sol and stability test.

	Extraction communalities	Corrected item–total correlation	Cronbach's–alpha if item deleted
Q1	0.586	0.535	0.787
Q2	0.457	0.534	0.787
Q3	0.566	0.635	0.765
Q4	0.423	0.491	0.798
Q5	0.662	0.679	0.756
Q6	0.612	0.553	0.784
Q7	0.535	0.438	0.576
Q8	0.711	0.553	0.413
Q9	0.499	0.387	0.642
Q10	0.540	0.599	0.795
Q11	0.546	0.619	0.789
Q12	0.637	0.658	0.778
Q13	0.711	0.714	0.761
Q14	0.510	0.506	0.820

- Step 5: Two translations provided by the fourth step were examined by the research team to make sure of the conceptual equality of the translations.
- Step 6: The research team made the conceptual comparison of the versions produced in the fifth step with the original scale. Finally, a single version was prepared in the original language, the tools were sent to the designer of the tools to obtain his views, and his views were implemented.
- Step 7: A final version (in Farsi) was provided to 16 family members of PWUDs to examine cognitive equality, and their abilities to understand, interpret, and perceive were evaluated.
- Step 8: The tools were reviewed according to the results obtained from the cognitive information to make sure of cultural adaptation.
- Step 9: Farsi version of the tools was controlled for any typos or grammatical errors.
- Step 10: Work process and the reported final version.

Data analysis

The face validity was examined using the views of 16 family members of PWUDs, and the quantitative and qualitative content validity was examined using the views of 16 researchers and experts (four psychiatric nursing and clinical psychology faculty members and four public health faculty members). Then, the quantitative content validity (21) of the tools was calculated for each item according to Walts & Basel index method (Table 1). The test-retest tool was used to examine the reliability of the tools (22), and Cronbach's alpha was used to test the internal consistency of the tools. All statistical analyses were carried out using SPSS 25 and LISREL 8.

Results

Descriptive results

The average age of PWUDs was 66.37 (±11.59) years with a minimum age of 18 years and a maximum age of 63 years, and the average age of the family members was 36.61 (11.25) years with a minimum age of 18 years and a maximum age of 63 years (Table 2).

10.3389/fpubh.2022.1017273

TABLE 4 Factors extracted after exploratory analysis.

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.564	39.745	39.745	5.564	39.745	39.745	3.261	23.294	23.294
2	1.332	9.512	49.257	1.332	9.512	49.257	2.704	19.317	42.612
3	1.100	7.857	57.114	1.100	7.857	57.114	2.030	14.503	57.114
4	0.981	7.010	64.125						
5	0.789	5.633	69.758						
6	0.727	5.192	74.950						
7	0.696	4.969	79.919						
8	0.601	4.294	84.213						
9	0.555	3.963	88.175						
10	0.493	3.520	91.695						
11	0.342	2.443	94.138						
12	0.310	2.218	96.356						
13	0.274	1.957	98.312						
14	0.236	1.688	100.000						

Construct validation results

Exploratory factor analysis (EFA)

Exploratory factor analysis was conducted on the 140 initial samples. First, the correlation coefficients of the scores of questionnaire items were examined, and it was assured that they were high. The results of Kaiser–Meyer–Olkin (KMO) and Bartlett's test of sphericity were used for this purpose (KMO = 0.841, chi-square = 751.072, P_{value} = 0.0001). Considering the values of KMO, carrying out EFA on this questionnaire was justifiable.

After making sure of the above assumptions, EFA was carried out on the subjects' answers and 14 items of the questionnaire. In this research, the principal component (PC) and Varimax rotation analysis methods were used to extract the factors. The shared values of each question were extracted using the PC analysis, and the results of their reliability test are shown in Table 3.

Then, to determine the number of factors, the factors whose percentage of specific value was > 1 were selected. The initial results showed that 3 factors or components can be selected to be analyzed. In Table 4, the extracted factors are shown along with the special values and the percentage of each factor's share in accounting for the variance of 14 items. The cumulative variance explained by each one of the 3 factors has been presented (Figure 1).

Annex Table 1 shows the rotated factor matrix. In this table, the questions with factor loadings > 0.3 and the greatest loading were loaded on the given component. According to the results presented in Supplementary Table 1, the extracted factors have been presented along with the items of each factor in Table 5.

Confirmatory factor analysis (CFA)

Confirmatory factor analysis was carried out for 311 samples. Mardia's test using skewness and kurtosis was used to confirm the multivariate normality of data distribution (values ranged from −2 to +2) where the statistic of Mardia's test was 126.36. As to multivariate normality, Mardia's test was used so that multivariate normality is rejected if the critical ratio (CR) for skewness is, < 7 (23, 24). EFA and CFA were used to confirm the construct validity (Table 1).

The results of the factor analysis test to determine standard coefficients are presented in Figure 2. Regarding the fact that all values of factor loadings and t vibration were greater than the critical value of 1.96, there was no need to remove any item (Table 5). Moreover, indices of CFA model fit are presented in Table 6. In contrast, the

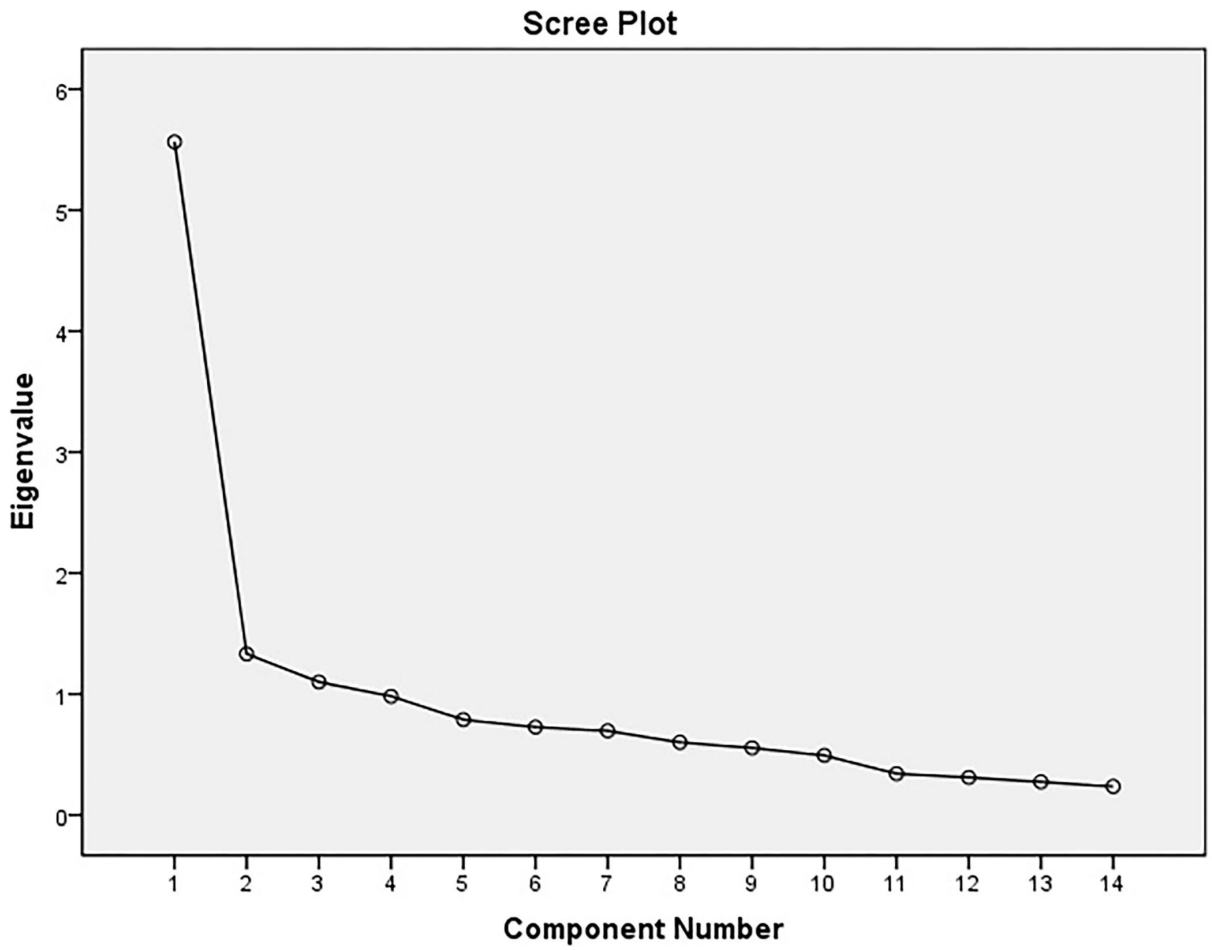

FIGURE 1
Cattell's scree plot of the extracted elements of the scale.

model fit is appropriate considering the fit indices shown in the above table. Therefore, the above model fits with the obtained data.

The reliability of the tools was obtained using the test-retest method and 15 individuals independent of the original sample who had completed the Farsi version (SSI-F of PWUDs) again after 10 days, and the value was obtained as $r = 0.891$. Cronbach's alpha was calculated to examine the internal reliability (internal validity) of the Farsi version of SSI-F of PWUDs and it was obtained as 0.879 for the total index of 14 items. The validity coefficient was obtained from 0.647 to 0.824 using Cronbach's alpha for the subscales of the Farsi version of SSI-F of PWUDs. Therefore, the subscales enjoy the required reliability to be assessed (Table 6). Moreover, Pearson's test showed that there was a positive and significant relationship between the subscales and the main scale (Table 7).

Discussion

This study was conducted to translate and evaluate the psychometric properties of SSI-F of PWUDs in Iran. In this study, at first, the cultural validation was carried out using the ten steps developed by Wilde et al. In this study, EFA with 140 subjects was used to examine the construct validity, and then the number of subjects is increased to 311, and CFA was carried out.

The results of EFA showed that the three factors account for about 57.114% of the variance of the 14 items, and 14 items and three factors were confirmed in effect. In the study conducted by Yildiz et al., the SSF-I with three factors and 14 items had been confirmed with a 66.6% variance of items in total (16). In this study, the first factor included 6 items, the second factor included 3 factors, and the third factor included 5 items where the results were the same as those of Yildiz et al. (16). In the

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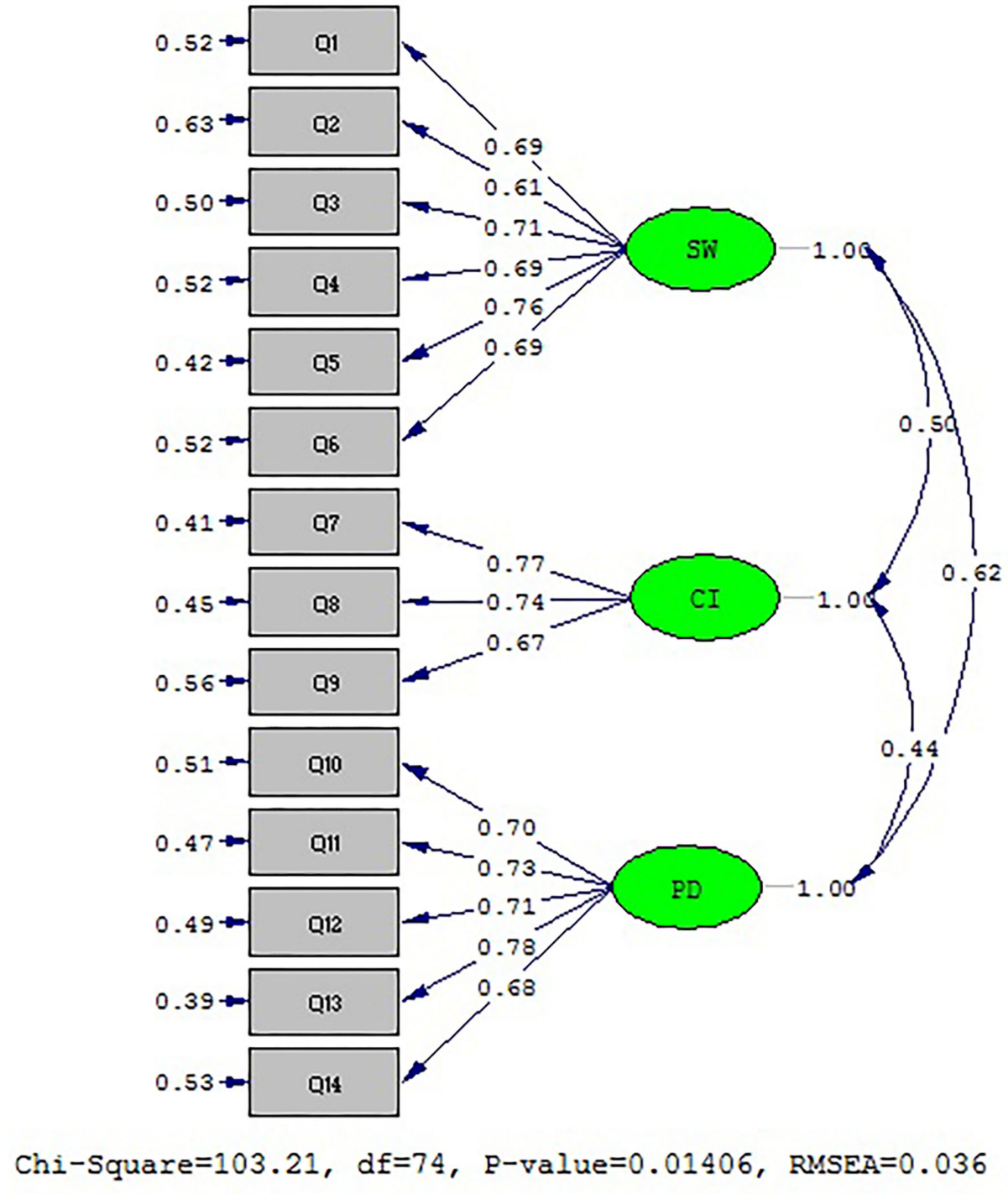

FIGURE 2
Three factor models of SSI_F in Iranian family members of PWUDs.

study conducted by Yildiz et al. considering the structure of the questionnaire based on existing scales concerning the families of the patients suffering from mental disorders and focus group interview on 19 items, finally 5 items were removed considering the low factor loading (15). However, in this study, EFA was carried out on the 14-item scale developed by Yildiz et al., and

TABLE 5 *T*–value, factor loadings, correlation, and Cronbach's alpha of the tool items.

Factor	No	T[a]	λ[b]	Correlation coefficient	Cronbach's alpha	
Social withdrawal (SW)	S1	13.05	0.69***	0.565**	0.787	0.810
	S2	11.11	0.61***	0.6**	0.787	
	S3	13.47	0.71***	0.659**	0.765	
	S4	13.09	0.69***	0.635**	0.798	
	S5	14.86	0.76***	0.71**	0.756	
	S6	13.11	0.69***	0.64**	0.784	
Concealment of the illness (CI)	S7	13.74	0.77***	0.568**	0.576	0.647
	S8	13.22	0.74***	0.546**	0.413	
	S9	11.71	0.67***	0.497**	0.642	
Perceived devaluation (PD)	S10	13.25	0.70 ***	0.649**	0.795	0.824
	S11	13.92	0.73***	0.64**	0.789	
	S12	13.57	0.71***	0.63**	0.778	
	S13	15.3	0.78***	0.68**	0.761	
	S14	12.81	0.68***	0.62**	0.820	
SSI–F (PWUDs)						0.897

$P_{value} < 0.01$ *$P_{value} < 0.001$.
[a]The calculated values of t for all factor loadings of the first and second order are > 1.96 and are therefore significant at the 95% confidence level, [b]The specific value, which is denoted by the Lambda coefficient and the statistical symbol λ, is calculated from the sum of the factors of the factor loads related to all the variables of that factor.

TABLE 6 Fit indicators confirmatory factor analysis SSI–F (PWUDs).

Fit indicators	Criterion	Level	Interpretation
χ^2/DF	3≤	1.39	Optimal fit
CFI	0.9<	0.99	Optimal fit
NNFI/TLI	0.9 <	0.99	Optimal fit
GFI	0.8 <	0.93	Optimal fit
RMSEA	0.08>	0.036	Optimal fit
R^2	Near to 1	0.99	Optimal fit
SRMR	0.05>	0.033	Optimal fit
		DF = 74	
		p–value = 0.093; Chi–Square = 103.21	

TABLE 7 Correlation coefficients of SSI–F (PWUDs) factors together.

	Social withdrawal	Concealment of the illness	Perceived devaluation
Social withdrawal	1		
Concealment of the illness	0.397**	1	
Perceived devaluation	0.525**	0.351**	1
SSI–F (PWUDs)	0.864**	0.649**	0.822**

**Correlation is significant at the 0.01 level (2–tailed).

it was carried out on families of PWUDs instead of families of individuals suffering from schizophrenia. Finally, the results of this study confirmed the same 3 factors with the 14 items in the SSF-I scale presented by Yildizet al. (16).

The results of CFA showed that the SSI-F of the PWUDs model with three factors in Iran has 14 items with an appropriate fit. In the study conducted by Yildiz et al., the SSI-F of the PWUDs model involved 3 factors and 14 items, and all fit indices were reported to be at the appropriate range (16). In explaining the results, it could be said that the above number of subjects was used in CFA, and the cultural similarities between Iran and Turkey can be one of the main factors resulting in the similarity in results.

The results of the study showed that the SSI-F of PWUDs of reliability coefficient was 0.891 and the stability of Cronbach's alpha was 0.879 in the range of 0.647 to 0.824. These results confirmed the acceptable reliability and stability of the test in the study population. The results of stability suggested by Yildiz et al. were consistent with the results of this study, in which Cronbach's alpha was found to be 0.88, and the reliability was reported to be 0.93 according to the test-retest method (16). This tool can be used for screening and evaluating the status of stigma in Iranian family members of PWUDs. Therefore, it can be used for teaching students and conducting research in the field of psychiatry, social sciences, and even family studies. In addition, it can be used in the rehabilitation process of PWUDs to support family members.

Strengths and limitations of the study

Carrying out CFA and EFA on two separate populations was one of the strengths of this study. Unfortunately, we faced

numerous problems due to the outbreak of coronavirus and the limitations help-seekers' families faced to participate in the study, and the sampling took more than 8 months. Moreover, due to the outbreak of coronavirus and the limitations of in-person contact with the subjects of the research, we resorted to having the questionnaires completed either in person in written form or electronically through WhatsApp and email.

Conclusions

Generally, the results showed that the SSI-F of PWUDs in Iranian families was valid and reliable with three factors and 14 items, and it can be used to conduct relevant studies.

Data availability statement

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

Ethics statement

The studies involving human participants were reviewed and approved by Kermanshah University of Medical sciences Ethical Committe, the Ethical Code (IR.KUMS.REC.1399.999) was also received to conduct the study. The patients/participants provided their written informed consent to participate in this study.

Author contributions

MD and AJ contributed to designing the study, AJ, MD, and AN collected the data, and data analyses were done by MD. The final report and article were written by AJ, MD, and AN. All authors participated and approved the study design. All authors read and approved the final manuscript.

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Conflict of interest

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

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2022.1017273/full#supplementary-material

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Mental health-related stigma discrimination and prejudices among Greek healthcare professionals

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Introduction: Research shows that mental health-related stigma, stereotypes, and prejudices have a negative impact on the patients themselves as well as on their families and social entourage. Healthcare professionals, whose expertise and professional ethos are historically acknowledged by public opinion, are expected to play a major role in combating discrimination against psychiatric patients. In this study, we aimed to assess the attitudes of Greek healthcare professionals toward mental illness and people suffering from it.

Materials and methods: It is a non-interventional, analytic study, in which 479 health workers from a tertiary hospital in Thessaloniki, Greece, participated. Every single hospital service –except the personnel of the Psychiatric Clinic– was included in our study: from the cleaning service to the administrative staff and the auxiliary staff such as stretcher carriers, food and nutrition services' staff, and social workers, the nursing staff, and finally the attending physicians, taking into consideration that the psychiatric patient, from the moment he/she enters the hospital, consecutively gets in contact with every work grade of the healthcare establishment. Participants' attitudes concerning mental illness have been evaluated using the Opinions about Mental Illness Scale (OMI), the Social Distance Scale (SDS), and the Level of Contact Report (LCR-12).

Results: Despite the high level of familiarity [as evaluated with LCR-12; mean score (μ): 8.82 $\pm$ 1.73], the employees displayed a rather poor willingness to interact with psychiatric patients (as measured with SDS; μ:11.68 $\pm$ 4.28), and endorsed significant prejudice toward individuals with mental disorders (assessed using OMI subscales; Social Discrimination μ: 22.99 $\pm$ 12.08, Social Restriction μ: 17.45 $\pm$ 9.07, Social Care μ: 21.04 $\pm$ 4.12, Social Integration

μ: 16.38 ± 4.68, Etiology μ: 9.80 ± 4.95). Age and education stood out as the main determinants of participants' attitudes, with younger and highly educated participants to have shown a relatively refined profile.

Conclusion: These results are not significantly improved compared to those of previous decades in Greek healthcare professionals and call for critical reflection and targeted stigma-reduction efforts.

KEYWORDS

stigma, mental health, mental illness, stigma-reduction, healthcare professionals

Introduction

The word "stigma" comes from the Greek verb "στίζω" *(stizo)* which means "to mark with a scar" (1), and has had, almost timelessly and universally, a negative meaning. In Ancient Greece, slaves were stigmatized, to be distinguished as the lowest in the social hierarchy (2). As Plato quoted in The Laws (page 854d), 'if anyone is captured performing blasphemy, if he be a slave or a foreigner, let his felony be marked on his visage and his palms.'

According to the American Psychiatric Association's Dictionary of Psychology, stigma is defined as the dismissive social attitude attached to a feature of an individual that may be considered as a psychiatric, corporal, or communal inadequacy. Stigma involves social disapprobation and can gradually result in unjustified discrimination and rejection (3).

Researchers today categorize mental health-related stigma into three different types: (a) social (public) stigma which involves the negative or discriminatory attitudes that others have about mental illness; (b) self-stigma which refers to the negative attitudes, including internalized shame, that people with mental illness experience about their own condition; and (c) institutional (structural) stigma, which is more systemic and involves policies of government and private organizations that intentionally or unintentionally limit opportunities for the psychiatric patients. Examples of such approaches favoring mental health-related stigma include lower funding for mental illness research as well as poorer access to mental health services compared to other healthcare services (4).

Social stigma that accompanies mental illness has a long-lasting tradition (5) and has been recognized as a serious obstacle to requesting help from mental health professionals (6). Due to mental health stigma, patients face many negative social consequences. Of all groups with chronic conditions or disabilities, they are one of the most unlikely to obtain employment (7), be in a secure and long-lasting relationship (8), have a proper housing (9), and finally experience social integration (10). Furthermore, they often undergo social seclusion, experiencing poor self-confidence and internalized pessimistic thoughts (11).

Social campaigns help to expose these issues as well as to relieve the arising concerns and currently many people identify stigma as a problem (12, 13). Unfortunately, disfavoring opinions still exist, urging mental health patients to refrain from treatment, finally resulting to the worsening of their condition (14, 15).

Public stigma remains a crucial issue also for Greek society. Research examining the existence of mental health-related stigma in the Greek culture showed that Greek citizens carry medium-high level of authoritarian attitudes (the opinion that psychiatric patients are inferior) and a moderate level of social restrictiveness (the opinion that they should be secluded and attentively monitored in the community), despite their high degree of sympathy toward them (16). This finding is in concordance with previous studies, as well (17–19).

Additionally, despite the modern psychiatric reform, stigmatization phenomena are still observed among Greek healthcare providers. A survey conducted in a provincial hospital in Greece revealed that health professionals, although being more confident about the competencies of the psychiatric patients, appear to be biased, confirming that the stigma of mental illness still exists (20). Some previous researchers have reported that younger age, less authoritarian personality characteristics, as well as higher educational and familiarity levels are associated with more positive attitudes toward psychiatric patients among health professionals, while doctors appear to carry fewer stigmatizing notions than other healthcare workers (21) and nurses display contradictory tendencies (22, 23).

Furthermore, in a study conducted in Greek psychiatric rehabilitation centers, health professionals appeared less disposed to adopt a positive attitude toward the treatment of mental illness, to propose amelioration of the offered services' quality, and to motivate the patients for equal presence and inclusion in the community (24). In a recent study, Greek mental health professionals appeared willing to keep a social distance from people with serious mental disorders, while

negative attitudes emerged, including futility of rehabilitation and considering patients as divergent (25). In another study examining Greek mental health professionals' opinions about psychiatric patients, some stereotypical opinions were documented regarding treatment duration, perceptions of psychiatric patients, and finally probability of recovery (26).

All health professionals are required to treat every patient with the utmost care and understanding, as they are invited to offer their services to individuals who are in a state of vulnerability due to their health condition. Especially regarding persons with mental disorders, health professionals have an additional duty to contribute decisively to the reduction of discrimination, stereotypes, and prejudices against them, both within their professions and society. Firstly, due to the historically significant role that their professions played in the exclusion of these patients from society and secondly because they are perceived by the public as "experts" on these individuals, and their accounts are likely to be believed and respected among members of the general public (27–29). Nevertheless, recent findings support that health –and mental health- professionals should realize and specify their role to a supporting one, by taking a step back and allowing the psychiatric patients to lead this fight, and focus on decisively amplifying these efforts (30). Our study seeks to make an approximate measurement of the presence and degree of stigmatization in the care and the reception of psychiatric patients among the major groups of health professionals in our hospital.

Materials and methods

Study design

This is a non-interventional, analytic study, in which 479 employees from "Papageorgiou" General Hospital of Thessaloniki, Greece, participated. "Papageorgiou" General Hospital is a Private Legal Non-profit Entity, established in 1999, in the western part of Thessaloniki, providing preventive care, diagnosis, treatment, and rehabilitation services as well as inpatient and outpatient services. It is fully integrated within the Hellenic National Health System and is on duty according to the on-call schedule of Thessaloniki's hospitals. The installation of university clinics in 2004 has completed in the best way by the Hospital's personnel, which has been in constant collaboration with the Aristotle University School of Medicine from that time. According to the hospital's recorded statistics for 2021, "Papageorgiou" Hospital employs a total of 1.871 individuals; 562 doctors, 924 nurses, and 385 other staff members (31).

After the approval of the study protocol by the Institutional Review Board of "Papageorgiou" General Hospital, the directors of every working unit were informed about and consented to the distribution of the questionnaires to the employees. The personnel of the Hospital's Psychiatric Clinic (doctors, nurses, psychologists, special educators, speech therapists) were purposely excluded, taking into consideration their specific training, as well as the different level of familiarity with mental disorders, and their exposure to psychiatric patients in more acute and difficult phases. Their exclusion does not assume that they necessarily have improved or worse attitudes, but we considered them as a specific population that would be better examined separately, as a topic of a different study. The purpose of the current research is the evaluation of attitudes toward psychiatric patients from the very first moment they enter the hospital as common citizens, irrespective of whether their altered mental state is known or not (another difference with the psychiatric department, where the presence of mental disorder for the inpatients or outpatients is given or implied).

In every other unit of the health care establishment, printed copies of specific questionnaires (see below for details) were distributed to a random sample of employees, following a short explanation of the study's goals. The participants provided informed consent and completed the questionnaires anonymously, unattended, with an estimated time of completion of 15–20 min. Subsequently, the questionnaires were collected in the same way that they had been handed out. The participation rate varied in every unit, depending mainly on the number of employees present at the initial briefing. In some departments, there was a minority of health workers that openly ignored or doubted the necessity of the survey.

Questionnaires/Tools

Sociodemographic questionnaire

Participants were asked to provide anonymous demographic information on their age, gender, family status, education, work experience, and profession. Regarding work experience, the following clarification must be made: the field was not limited to the experience gained in the studied hospital, but in general. This implies that some professional categories (such as administrative or auxiliary staff) may have worked in different environments before, probably with a different level of interaction with patients.

Opinion about mental illness scale (OMI)

They were also given the Opinions about mental illness scale (OMI) (32). The OMI scale was initially developed by Cohen and Struening in 1959 to evaluate the beliefs of healthcare workers regarding mental disease. The present structure of the OMI scale -which was derived from extensive factor analysis of its initial form of 200 items by more than 8,000 people experienced in mental health- includes 51 declarations displayed via a 6-point Likert-type scale (33). Answers vary from 1 (Fully

Agree) to 6 (Fully Disagree). Factor analysis of the 51 items revealed the following five subscales: Factor A: Authoritarianism (A, 11 items): the opinion that people with a mental illness cannot be held accountable for their acts, and that they should be controlled by society, Factor B: Unsophisticated Benevolence (UB, 14 items): an attitude that could be placed between tolerance and pity/compassion; Factor C: Mental Hygiene Ideology (MHI, 9 items): the opinion that mental illness is similar to other illnesses, and that it should receive adequate treatment by specialists; Factor D: Social Restrictiveness (SR, 10 items): the opinion that psychiatric patients should be restricted in some social domains, and Factor E: Interpersonal Etiology (IE, 9 items): the belief that the real cause of a mental illness can be found in problematic interpersonal relations (32, 33).

The Greek OMI version (**Supplementary Table 1**), standardized for the Greek population by Madianos et al. (17), follows a modified evaluative scheme (**Supplementary Table 2**), which stresses the following five factors:

- Factor 1: Social Discrimination (SD, 16 items): this factor refers to the distinguishing characteristics of psychiatric patients, who are mainly portrayed as inferior individuals compared to those considered as "normal." It also includes a latent belief that patients suffering from mental illness need to be treated in an authoritarian way. Example items: "There is something about mental patients that makes it easy to tell them from normal people," "Psychiatric patients let their emotions rule them while normal individuals think about what to do," "Although patients discharged from mental hospitals may seem all right, they should not be allowed to marry."
- Factor 2: Social Restriction (SR, 13 items): It represents the tendency that preventive measures should be taken by the society regarding psychiatric patients. It involves dismissive and compulsive notions about sanctions during or after a psychiatric hospitalization. Example items: "There is little that can be done for patients in a mental hospital except to see that they are comfortable and well fed," "Anyone who is in a hospital for a mental illness should not be allowed to vote," "All patients in mental hospitals should be prevented from having children by a painless operation."
- Factor 3: Social Care (SC, eight items): This factor includes positive opinions regarding the treatment ideology, suggesting amelioration of quality of care and social support. Example items: "Our mental hospitals should be organized in a way to make the patient feel as much as possible as if he is living in his home," "Psychiatric patients who cannot work because of their mental illness should be given money to live on."
- Factor 4: Social Integration (SI, eight items): This one depicts the need to encourage equality in social participation and inclusion of psychiatric patients in every aspect of life in the community. Example items: "Many psychiatric patients are capable of skilled work, even if they are somehow mentally disturbed," "Most people in mental hospitals are not dangerous."
- Factor 5: Etiology (E, six items): This factor refers to the conceptions about the etiology of mental illness, expressing a tendency to attribute that to the patients' family. Example items: "If the children of mentally ill parents were raised by normal parents, they would probably not become mentally ill," "Mental patients come from homes where the parents took little interest in their children."

For every factor, the final score is derived by summarizing the scores of all the items included and subtracting them from a constant number. Higher scores indicate that the respondent leans more toward the attitude expressed by each factor (23). More specifically, higher scores for factors 1, 2, and 5 indicate more stigmatizing and stereotypical attitudes, whereas higher scores for factors 3 and 4 express more favorable perceptions toward mental illness and patients suffering from it.

The OMI scale has been used globally over decades among health professionals' categories, as well as in different populations such as undergraduate students, general population, and even psychiatric patients' relatives (32–35). Additionally, the OMI scale has been widely used in Greece, targeting both the general population (17, 18), and subpopulations such as mental health professionals (25, 26, 36) and students (23, 37–39).

Social distance scale (SDS)

Participants were also given the social distance scale (SDS) (40, 41), which consists of seven items (**Supplementary Table 3**), answered using a 4-point Likert-type scale. Example items: "How willing would you feel to recommend a mentally ill person for a job to someone you know?", "How willing would you feel to have a mentally ill person take care of your children?" Options for the Greek version that was used vary between 0 (Absolutely Unwilling) and 3 (Absolutely Willing) (42), but the scores were reversed in the statistical analysis, in order to be comparable with the results from the international literature. Total scale scores range between 0 and 21, by summing the individual scores of all responses. This scale measures the social distance the interviewee wants to keep toward a person with a particular condition; in the present study, it measures the distance the hospital staff wants to keep from mental health patients (42, 43), with higher scores representing a greater desire to do so.

Level of contact report (LCR-12)

The last questionnaire participants were given was the level of contact report (LCR-12), which is a scale developed by Holmes et al. (43, 44). It is a psychometric self-report test that measures familiarity with mental disorder. LCR-12 consists of 12 phrases/answers (**Supplementary Table 4**), each one of which corresponds to a specific score (from 1 to 12), depending on

the ascending degree of familiarity with mental illness that it represents (45). Example items: "I have never observed a person that I was aware had a mental illness" (rank order score 1), "I have watched a movie or television show in which a character depicted a person with mental illness" (score 3), "I have a mental illness" (score 12). Regarding the completion of the scale, the respondent can choose 1 or more of the 12 statements, in case he/she has experienced them before (23, 44). The final score of each participant is equal to his/her answer with the highest score, that is, of the one representing the highest degree of familiarity (44, 46).

For all questionnaires, the validated Greek version was used (17, 23, 42).

Statistical analysis

Data were evaluated for deviations from normality by Kolmogorov–Smirnov test. Comparison of means scores at OMI subscales (Social Discrimination, Social Restriction, Social Care, Social Integration, and Etiology), SDS, and LCR between categories in sex (male vs. female), age in years [(a) <30, (b) 31–40, (c) 41–50, (d) 51–60, (e) >60], profession [(f) Physicians, (g) Nurses, (h) Administrative employees – including social workers, (i) Stretcher-carriers, (j) Cleaning services, (k) Food-nutrition services, (l) Other – namely ward assistants, midwives, laboratory assistants, physical therapists, security staff], family status [(m) Married, (n) Divorced, (o) Widower, (p) In relationship, (q) Single], education [(r) Secondary education – SE, (s) Higher-educational institution – HEI, (t) Technological educational institute – TEI, (u) MSc, (v) PhD], years of work experience [(w) 5 years, (x) 5–15, (y) 16–20, (z) 21–26, (@) >26] were performed with parametric tests in case of normal distribution (*t*-test, ANOVA). Otherwise, non-parametric tests were applied (Mann–Whitney *U* test and Kruskal–Wallis test). In case of statistical significance, *post hoc* analyses were carried out, to identify demographic differences between specific groups. The same analysis was performed for items 4, 24, 29, 41, and 51 of the OMI scale. Cronbach's alpha was also calculated in each subscale of OMI, and SDS and LCR scales to assess the influence of each one on the subscale's internal consistency. Spearman's correlation was performed to assess the relationship between subscales of OMI, SDS, and LCR. A significance level of < 0.05 was used for all analyses.

Results

Sample characteristics

In total, 479 subjects were recruited and stratified based on gender: 70.6% female, 29.4% male; age: 19.3% < 30 years, 24.3% 31–40 years, 32.5% 41–50 years, 23.4% 51–60 years, 0.6% > 60 years; occupational status: 25.9% physicians, 40.0% nurses, 7.7% administrative employees, and 5.4% stretcher-carriers, 1.0% cleaning services' staff, 7.9% food and nutrition services' staff and 11.9% other professions; family status: 56.9% married, 6.4% divorced, 1.0% widowers, 14.6% in relationship, and 21.1% single; education level: 30.2% SE graduate, 22.0% HEI, 26.0% TEI, 17.8% MSc, 4.0% Ph.D. and years of work experience: 27.0% < 5 years, 31.6% 5–15 years, 20.5% 16–20 years, 12.1% 21–26 years, 8.8% > 26 years. Detailed sample characteristics are presented at **Supplementary Table 5**.

Cronbach's alpha

The internal consistency was excellent (>0.7) for the items of Social Discrimination and Restriction OMI's subscales and SDS, acceptable (0.689) for the items of Etiology, and unsatisfactory for the items of Social Care (0.568), Social Integration (0.564), and LCR (0.594).

Comparison of OMI subscales

Results are presented in **Supplementary Table 6**.

Social discrimination (SD)

Analysis for mean scores regarding Social Discrimination revealed no statistically significant difference in mean scores for the Social Discrimination based on sex. Statistically significant associations were found for age, profession, family status, education, and years of work experience, with lower (less discriminative) scores for the <30 years, physicians, those in a relationship, those with MSc, and those with less than 5 years of work experience. Nevertheless, all groups demonstrated moderate levels of discriminative attitudes (with their answers varying between "probable agreement" and "probable disagreement" with the given notions), while the aforementioned groups barely stood out in a more positive way.

Social restriction (SR)

Analysis for mean scores regarding Social Restriction revealed no statistically significant difference in mean scores for the Social Restriction based on sex, family status, and work experience. Statistically significant associations were found for age, profession, and education, with lower(less restrictive) scores for the 31–40 years, physicians, and those with MSc. However, the majority of all groups (except those > 50 years, auxiliary staff other than administrative personnel, secondary school graduates, widowers, and employees of > 26 years work experience) showed a more distinct disapproval of the restrictive measures considering their mean scores, even though standard deviations remained considerable.

Social care (SC)

Analysis for mean scores regarding Social Care revealed no statistically significant difference in mean scores for the Social Care based on sex, and family status. Statistically significant associations were found for age, profession, education, years of work experience with lower (less supporting) scores to be for the <30 years, physicians, those with a Ph.D. and less than 5 years of work experience. This factor is considered to be the one with the most positive impact and greatest accordance among the respondents, as all groups showed distinct positive attitudes toward the need for amelioration of the providence for psychiatric patients (mean scores within the spectrum of "agreement" with the items included), while those with work experience > 26 years crossed the barrier to more definite and positive "waters" (spectrum of "full agreement" with the items), and the stretcher-carriers, other auxiliary staff, those > 51 years old and widowers almost came close, as well. It should be highlighted that in this factor we observe a reversal in the classification of the age-professional-educational and work experience groups, compared to the order shown in the other factors.

Social integration (SI)

Analysis for mean scores regarding Social Integration revealed no statistically significant difference in mean scores for the Social Integration based on sex, age, and work experience. Statistically significant associations were found for profession, family status, and education, with higher scores (more positive attitudes toward psychiatric patients) to be found in physicians, widowers, and those with Ph.D. Nonetheless, all groups were reluctant to express a positive opinion (mean scores within the spectrum of "rather agree" with the items included). The only group that managed to score higher (within the spectrum that expresses "agreement") were those > 60 years old, who represent a mere 0.6% of the sample.

Etiology (E)

Analysis for mean scores regarding Etiology revealed no statistically significant difference in mean scores for the Etiology based on sex, family status, and years of work experience. Statistically significant associations were found for age, profession, and education, with lower scores (equivalent to less stereotypical attitudes) for the <30 years, physicians, and those with MSc. The mean scores of all groups revealed the participants' ambivalence, as they ranged at medium levels (expressing "probable agreement" or "probable disagreement" to the stereotypical notions mentioned).

Comparison of SDS

Analysis for mean scores regarding SDS revealed no statistically significant difference in mean scores for the SDS based on sex and work experience. Statistically significant associations were found for age, profession, family status, and education, with lower scores—depicting greater willingness to associate with psychiatric patients—for the <30, administrative staff, those in relationship, and those with MSc. The mean scores of all groups were found within the spectrum of "probable unwillingness," while administrative staff and MSc holders managed to enter into the next—but still unsatisfactory—zone of "probable willingness" to interact with psychiatric patients, with the rest of the groups mentioned above coming quite close. Regarding the individual items, respondents appeared more receptive to having a neighbor with mental illness or introducing a patient to their friends, while they were more negative about having a psychiatric patient as the caretaker or spouse of their children, or as a housemate. Results are presented in **Supplementary Tables 3**, **6**.

Comparison of LCR

Analysis for mean scores regarding LCR revealed no statistically significant difference in mean scores for the LCR based on sex, age, family status, and work experience. Statistically significant associations were found for profession and education, with higher scores to be for the physicians, and food-nutrition services' staff, those in relationship, and those with MSc or Ph.D. Respondents appeared more aware and displayed greater sensitivity in this questionnaire, with mean scores of all groups (apart from "other" staff – mean score: 7.70) being over 8.29, where "8" stands for the question "My job involves providing services/treatment for persons with a mental illness," while the items rated higher than that refer to friends/relatives/family/oneself with mental illness. It is remarkable that 72.7% consider providing services to psychiatric patients as part of their job, 40.1% admitted that a relative of theirs suffers from a mental disorder (item rated as 10), while 5.5% declared that they themselves suffer from a mental illness (highest degree of contact report according to LCR: 12). Results are presented in **Supplementary Tables 4**, **6**. Characteristics and opinions of those who selected the high-scoring items of LCR are reported separately in **Supplementary Table 7**.

Spearman correlation

Spearman correlation revealed that Social Discrimination and Social Restriction were positively correlated with SDS and negatively correlated with LCR. That is, being more willing to associate with psychiatric patients, as well as being more familiarized with them leads to less discriminative and restrictive attitudes toward them. Also, being less discriminative and restrictive toward psychiatric patients leads to a greater willingness to interact with them. Etiology was positively

correlated with SDS, that is, less stereotyped opinions about the causes of mental illness are associated with greater readiness to interact with them, as well as the reverse. Social Integration was positively correlated with LCR and negatively correlated with SDS, which indicates that greater familiarity with and desire to connect with psychiatric patients is associated with a more supportive ideological stance toward them, regarding their equal social participation, and vice versa. Social Care was negatively correlated with SDS, which means that higher willingness to interact with mental patients corresponds to a higher desire for social support and improved provisions for them, and the opposite conclusion as well. Finally, SDS was negatively correlated with LCR, that is, level of familiarity is directly proportional to willingness to associate with mental patients. Results are presented in **Supplementary Table 8**.

Comparison of selected items 4, 24, 29, 41, and 51 of OMI scale

The following questions were selected to be separately described, due to their specific weight in capturing stigmatizing and more problematic attitudes. Results are presented in **Supplementary Table 9**.

Item 4

"*Even if psychiatric patients may seem to be okay, they should not be allowed to get married*". It is included in the social discrimination factor. Analysis for mean scores regarding Item 4 revealed statistically significant difference in mean scores for the Item 4 based on sex, age, profession, family status, education, and years of work experience, with higher scores (less authoritarian) for males, <30 years, physicians, those in relationship, those that graduated from HEI, and those with less than 5 years of work experience.

Item 24

"*It would be foolish for a woman to marry a man who once had a serious mental illness, even if he appeared to be fully mentally restored*". It belongs to social discrimination items. Analysis for mean scores regarding Item 24 revealed no statistically significant difference in mean scores for Item 24 based on sex. Statistically significant associations were found for age, profession, family status, education, years of work experience with lower (more discriminative) scores for the <30 years, physicians, in relationship, those that graduated from HEI, and with less than 5 years of work experience.

Item 29

"*Anyone who is hospitalized in a psychiatric unit should not be allowed to vote*". It is included among the items of social restriction factor. Analysis for mean scores regarding Item 29 revealed no statistically significant difference in mean scores for Item 29 based on sex, age, family status, and work experience. Statistically significant associations were found for profession and education, with higher scores (expressing less restrictive attitudes) for the administrative employees, and those with MSc.

Item 41

"*Most women who have been hospitalized in a psychiatric unit should be trusted to look after children*". It constitutes one of the social integration items. Analysis for mean scores regarding Item 41 revealed no statistically significant difference in mean scores for Item 41 based on age, family status, and work experience. Statistically significant associations were found for sex, profession, and education with lower scores (more favorable attitudes) for males, administrative employees, and those with PhD.

Item 51

"*All patients in psychiatric units should be prevented from having children with sterilization*". It is indicative of social restriction items. Analysis for mean scores regarding Item 51 revealed statistically significant difference in mean scores for Item 51 based on sex, age, profession, family status, education, and years of work experience, with higher scores (representing less restrictive notions) for males, those 31–40 years, physicians, in relationship, those with MSc, and less than 5 years of work experience.

Presentation of the OMI items with the extreme mean scores and standard deviations

Mean scores and standard deviations for every item of OMI are presented in **Supplementary Table 1**. In **Tables 1**, **2**, the items that stood out in the total sample—either by their mean score or their standard deviation—are presented.

As shown above, respondents expressed more absolute opinions in favor of mental health patients, in matters of social care (agreement with the items, expressed by low mean scores) and social restriction (disagreement with the items, expressed by high mean scores), whereas their answers also converged regarding the previous two factors (expressed by low standard deviations).

Discussion

The aim of the present study was to assess the attitudes of health professionals at "Papageorgiou" General Hospital toward mental illness and people suffering from it. "Papageorgiou" General Hospital is a fully equipped tertiary healthcare facility, located in and providing services to Thessaloniki – the largest

TABLE 1 Items of maximum and minimum mean scores in OMI analysis.

Items of OMI	Mean score*	Standard deviation
Even though patients in mental hospitals behave in funny ways, it is wrong to laugh about them.	1.32	0.704
Anyone who tries hard to better himself deserves the respect of others.	1.58	0.830
Our mental hospitals should be organized in such a way as to make a patient feel, as much as possible, as if they were living at home.	1.73	0.779
Sometimes mental illness is a punishment for bad deeds.	4.94	1.208
Being hospitalized in a psychiatric clinic is tantamount to failing in real life.	5.10	0.997
The best way to handle patients in mental hospitals is to keep them behind locked doors.	5.33	0.821

*Answers rating scale from 1 (Fully Agree) to 6 (Fully Disagree).

TABLE 2 Items of maximum and minimum standard deviations in OMI analysis.

Items of OMI	Mean score*	Standard deviation
Even though patients in mental hospitals behave in funny ways, it is wrong to laugh about them.	1.32	0.704
Our mental hospitals should be organized in such a way as to make a patient feel, as much as possible, as if they were living at home.	1.73	0.779
The best way to handle patients in mental hospitals is to keep them behind locked doors.	5.33	0.821
One of the main causes of mental illness is the lack of moral strength, willpower.	3.35	1.437
If parents loved their children more, there would be less mental illness.	3.61	1.524
Mental illness is an illness like any other.	3.24	1.589

city in Northern Greece, and the second largest city in the country. Furthermore, it includes a psychiatric ward, where inpatients come into contact with non-psychiatric health professionals in a variety of ways: e.g., when food is transferred to them, their rooms are cleaned, they are carried to other departments for diagnostic tests or examinations for physical symptoms that may occur, and when they receive useful services from social workers and other administrative staff. As a result, there is a greater level of contact between other healthcare specialties and psychiatric patients, in comparison with other hospitals without a psychiatric department. Therefore, it is of special interest to study the type and extent of the stigmatizing opinions and beliefs held by healthcare professionals that work in the other departments of "Papageorgiou" General Hospital toward people suffering from mental disorders.

Greek studies from the last decades indicate that, after the drastic changes and modernization of mental health services since the 1980s (47, 48), there has been distinct progress in the attitudes of the general population and healthcare professionals toward mental illness. However, it seems that this progress has continued to move along at the very slow pace of the still "under-construction" mental health reform that remains incomplete (18, 48, 49). This discrepancy with the quick development in many other areas of modern society and human needs poses a great challenge to the Greek society.

Overall, our study describes a certain degree of positive attitudes toward psychiatric patients among healthcare workers at our institution. However, it also documents that a higher grade of familiarity and interaction with people suffering from mental illness (as indicated by the high LCR scores in our study) does not guarantee by itself the development of adequate favorable opinions toward those patients.

In the following section, we describe the specific features of stigmatization carried out by each group of healthcare professionals and identify areas for possible intervention. Regarding the different groups of healthcare professionals, we observe that:

- Even though there was a difference between the size of the female and male samples, sex did not affect any of the examined factors.
- Family status did not result in remarkable statistical differences, except for the Social Care factor, Social Distance willingness, and some aspects of Social Integration.
- Years of work experience resulted in statistical differences only with regard to Social Discrimination, while the positive attitudes of those working for more than 26 years regarding Social Care stood out among all groups.
- Younger participants (<40 years old) showed a more favorable attitude to mental illness in the fields of Social Distance, Social Restriction, Etiology, and willingness to interact with patients. No statistical differences based on age were found regarding Social Integration, while Social Care was the only sector where people older than 40 years appeared more supportive.

- Education played a consistent role in all examined factors except for Social Care (alongside "age"). More specifically, as higher educational level increases, attitudes toward mental illness become more and more favorable. We should mention the exception of Ph.D. holders, who do not follow precisely the previous rule, probably given that they were a small sample.
- With respect to profession, physicians and administrative staff presented more deficits regarding Social Care. On the other hand, the staff of the auxiliary services showed greater sensitivity in terms of Social Care, with significant deficits in other fields. It is notable that nurses—that is, the largest group—did not stand out in any of the examined factors and were always bridging the—rather small—gap between the other groups.

Summarizing our results, we can conclude that a high level of contact with patients suffering from mental illness is not necessarily associated with the sufficient willingness to interact with those patients, nor does it reduce decisively the existing prejudices. This finding is consistent with other studies indicating that contact with people suffering from mental disorders could be of help under specific conditions, such as interacting with individuals who are not in the acute phase, in a frame that endorses companionship (between peers considered as equal) and includes common goals and joint efforts (50). In a healthcare environment, it is of critical importance to be able to observe the long-term effect of treatment on psychiatric patients, instead of interacting with those not receiving appropriate mental support, remaining unwell, and spreading a sense of hopelessness (51).

Overall, most of our respondents showed a rather paternalistic, but sympathetic view of psychiatric patients, which reflects a certain degree of favorable attitudes toward them. This finding is supported by other studies, which have shown that when it comes to society's attitudes toward mental health patients, charitable views tend to prevail and the responsibility to provide the best possible care is recognized by a large majority (52, 53).

Taken together, our results show that physicians and administrative staff—despite the fact that the latter may have possible previous work experience in different sectors and the former might be able to claim to work more often and more closely with patients—did not differ significantly with regard to the majority of the examined factors. The same holds true for the auxiliary staff (stretcher–carriers, food services, and cleaning services staff). We cautiously conclude that age and educational level are the main determinants affecting health professionals' attitudes toward mental illness. This finding is consistent with other studies as well (17–19, 23). Moreover, it is promising for the new generations and it also opens a perspective for intensive educational efforts aiming at the amelioration of health workers' attitude toward mental illness.

Of course, our study has certain limitations:

- We report results from a single hospital with specific features, as mentioned above. Nevertheless, we claim that it constitutes a random sample of the Greek National Health System. The hospital staff is recruited with the same criteria that are used for the whole public sector. Furthermore, there are no reports from the literature that state contrary findings.
- Some caution is also warranted, as different healthcare professions were not equally distributed in the sample population. Age distribution among these groups was not equal, as auxiliary staff (food services' staff, stretcher–carriers, and cleaning services) consists mainly of employees older than 40 years old, with a lower education level. Finally, subjects aged over 60 years old, Ph.D. and widowers constitute small groups, and their results should be assessed cautiously.
- Cronbach's alpha for the items of Social Care, Social Integration, and Level of Contact Report was unsatisfactory.
- The sample includes employees that might have previously worked in different sectors, such as the administrative and auxiliary staff. However, their potential difference in previous working experience was not captured by the questionnaires, and this could have been a factor leading to a differentiation in attitudes toward psychiatric patients, in comparison with those with experience solely in the health sector.
- The exact response rate was not possible to be determined, due to the way the questionnaires were distributed and recollected.
- Differing from other studies, the staff of the psychiatric clinic was excluded (22, 23).
- The research took place during the COVID-19 pandemic. Thus, we were unable to assess whether personal health concerns, anxiety, and professional fatigue influenced the employees' responses.

Possible implications of our study

The results of our study are of clinical, educational, and research interest.

Despite an impressive amount of positive attitudes toward patients with mental illness, our study detects a significant degree of stigmatization among healthcare workers of all professions, although with differences between the distinct subgroups. In clinical practice, the presence of prejudiced notions could negatively affect the way that people suffering from mental illness are treated during their hospitalization. They might become objects of underestimation, leading to

underdiagnoses and undertreatment (4, 54–56), with clear and present danger to the patients' health (57–59). Open stigmatization could discourage psychiatric patients from seeking medical assistance (6, 60), often perceived as weakness or failure (51).

Educational efforts and interventions should aim at increasing the level of empathy, fighting ignorance and its consequent misconceptions, as well as at reducing the accompanying fear of healthcare professionals. As reported in previous studies, appropriate educational programs could lead to the amelioration of perceptions of mental illness and of patients suffering from it (15, 61–64). These procedures should start from the mandatory (basic) educational system but should be continued into the higher stages of public education, with special respect to the institutional education of health professionals. Seminars of lifelong learning and campaigns could complete this educative triangle. In order for these changes to take place, universities, hospitals, and public health institutions are requested to press for adequate political action (65). Nevertheless, it should be highlighted that modern literature rejects a sterile educational approach that could bring about some undesirable negative results (e.g., education focusing on the biogenesis of mental illness, despite taking away the causative "blame" from individuals, has been associated with increased hopelessness for patients' course and amplification of stigmatizing beliefs) (30, 50, 66). What is proposed is the combination (67) of theoretical educative procedures and contact with people with lived experience of mental illness [either face to face or via technological means (68)], that is, people who can narrate their story of success (30, 66), inspire and directly combat stigma. Among these individuals, health professionals suffering from mental illness are nowadays called upon to play a major role in anti-stigma efforts (30, 66). Our results offer the additional possibility of detecting specific features of stigmatization among the subgroups and give focus to targeted interventions based on them.

Regarding future research, it could be very interesting if staff's attitudes were reevaluated after the implementation of an educative program, in order to detect any differentiations and assess the followed procedure. Moreover, the undergraduate students' attitudes could be measured and compared to those of the respective working groups, in order to examine whether younger generations are more romantic and show greater understanding, or whether they are indifferent and ignorant (69, 70). Furthermore, possible differences due to the age gap raise the question of whether daily clinical reality impacts negatively the personnel, or instead leads to an increased level of empathy. Also, it is of interest whether the changes in attitudes are due to greater exposure to mental illness or to professional burnout (51). In addition, the attitudes of the employees working in the primary and secondary health care sector (where there is greater familiarity with the patients) could be assessed and compared with our results. The authors are currently running a study on stigmatizing beliefs in medical students and primary healthcare practitioners.

Taking into consideration that the level of a civilization is indicated by the attitude of society toward its most vulnerable and least favorable members, people suffering from mental disorders should hold a special place in society's heart and social policy. In a country that has undergone rapid changes in the past decades, stigmatization phenomena stemming from lack of awareness and education should be fought. Even though the presented numbers demonstrate a level of amelioration in terms of discrimination, restriction, and etiology, compared to those of previous decades (17–19, 21–23), these changes are insufficient. Numbers call for action, human lives call for understanding, and societies and especially health professionals should remain alert. The Greek health and mental health system's reform should concentrate not only on the improvement of materials, techniques, and infrastructures, but equally aim at the improvement and refinement of ways and attitudes when providing services to each patient. Even though asylums like Leros are now a thing of the past (47, 71), many actions are still required (48, 72) to replace the flawed present depicted in our study with a future characterized by a decisively positive attitude toward mental illness and the people suffering from it.

Data availability statement

The original contributions presented in this study are included in the article/**Supplementary material**, further inquiries can be directed to the corresponding authors.

Ethics statement

This study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board of the Neurology Clinic, "Papageorgiou" General Hospital of Thessaloniki, Greece (protocol code: 120/date of approval: 19/02/2021). The patients/participants provided their written informed consent to participate in this study.

Author contributions

G-NP, GD, MAt, and JR: conceptualization. GD, JR, EB, and VS: methodology. VS: software. VS, MAt, G-NP, and

GD: validation. VS, MAt, and JR: formal analysis. G-NP, MAt, SS, MK, AM, MAn, NZ, and GD: investigation. G-NP, MAt, SS, MK, AK, AM, MAn, NZ, and GD: resources. VS, MAt, GD, and JR: data curation. G-NP, MAt, EB, and SG: writing—original draft preparation. G-NP, MAt, EB, SG, and JR: writing—review and editing. G-NP, MAt, GD, and JR: visualization. GD, JR, and ID: supervision. GD, JR, and MAt: project administration. All authors read and agreed to the published version of the manuscript.

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Conflict of interest

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

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2022.1027304/full#supplementary-material

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Stigma as a barrier to suicide prevention efforts in Iran

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Suicide and suicide attempt affect a considerable part of the general population, and in spite of their prevalence, the stigma associated with suicide remains an unsolved problem surrounding this important public health problem, especially in lower-income countries such as Iran. Evidence shows that help-seeking from formal mental health services for suicidal people is low in countries like Iran. Previous studies on Iranian survivors of suicide attempts have shown that these people experience fear of stigma due to labels such as loss of faith in God, having forms of severe mental illnesses ("*madness*"), and being involved in unaccepted sexual relationships. The associated stigma prevents them from seeking appropriate health and social services. Although both self-stigma and public stigma contribute to an unwillingness to seek mental health care and suicide prevention efforts in Iran, public stigma may be of greater consequence, significantly impeding an individual's likelihood of accessing care for their suicidal thoughts or attempts. In such circumstances, many people with suicidal thoughts miss out on social and formal support programs offered by social and healthcare providers. In this perspective article, focusing on the public stigma regarding suicide in Iranian society, we address the challenges and barriers to seeking suicide prevention efforts in Iran and discuss culturally appropriate strategies to improve the current situation.

KEYWORDS

stigma, suicide prevention, suicide behavior, mental health, Iran

1. Introduction

Suicide is a critical public health issue caused by various individual, economic, and sociocultural factors. More than 700,000 suicide deaths occur worldwide each year, and most of these incidents happen in low- and middle-income countries (LMICs) (1). Although the suicide rate among Islamic societies is low, evidence shows that the trend of suicide deaths in Iran is increasing; In the past years, it has increased to 9.9 per 100,000 people (2). Due to cultural and socioeconomic factors, men in Iran are particularly vulnerable (3). In addition, family conflicts and marital issues are the leading reported triggers of suicide, followed by financial difficulties and poor academic performance (1).

Suicide is one of the mental health issues that is accompanied by stigma, and numerous studies have documented highly prevalent stigmatizing attitudes toward suicidal individuals especially in low- and middle-income countries like Iran (4, 5).

Individual Attitudes, beliefs, and behavioral patterns can be affected by the stigma of mental illness and suicide. Important aspects of stigma, such as fear and shame, negative beliefs toward mental illness, prejudice from society, social isolation, and discrimination, serve as obstacles to people who are at risk of suicide and prevent them from seeking assistance (6). It should be noted that seeking appropriate help is critical to preventing the exacerbation of mental health problems and reducing the risk of suicide yet, according to one study, only 62% of people who attempt suicide sought mental health services in the year leading up to it (7). Reducing the stigma surrounding mental health problems is linked to the decline of several negative mental health outcomes, notably suicide (8). The first step in reducing public health problems such as suicide is improving public awareness about suicide (9). Legal actions, such as the establishment of government anti-discrimination laws to reduce stigma around suicide and boost help-seeking, are also crucial in lowering suicide attempts. These include increasing the public and policy-makers' understanding of suicide (10, 11). We explore the difficulties and barriers to suicide prevention efforts in Iran in this perspective paper, which focuses on the public stigma associated with suicide in Iranian society. We also review culturally appropriate improvement strategies.

2. Suicide stigma and challenges in Iran

A key barrier to using mental health services in Iran is the stigma associated with psychiatric problems (12). The interactive phases of problem assessment, assistance-seeking decision, and service selection are often how people seek out healthcare treatments for mental health. However, several factors, such as mental health literacy, attitudes and beliefs regarding suicide, the perceived need for treatment, and other internal and external impediments, May reduce the likelihood of an individual engaging in these help-seeking behaviors (13, 14).

In Iran, utilizing mental health services is hampered by the widespread stigmatization of mental illnesses and, in general, psychiatry practice among the general public, and even among educated people and authorities. Therefore, stigma-related shame and the fear of being labeled psychiatric diagnosis are significant obstacles to obtaining care (12, 15). According to some Iranian research, inadequate mental health literacy exists not only in the general population but also among students and the educated. Some scholars may refer to psychiatric disorders as spiritual problems that should be dealt with spiritually (16, 17). This is despite the fact that there is an inverse relationship between mental health literacy and stigma, in such a way that the lower the mental health literacy in a society, the greater the stigma in that society (16). This not only becomes a barrier to help-seeking among vulnerable people in society, but also affects the quality of life in the community. In addition, poor mental health literacy in Iranian society has led to self-stigma among different populations and is an important barrier to help-seeking in high-risk individuals (18).

People who have experienced indifference and/or negative attitudes from healthcare workers, may use health services inadequately (15). In Iranian medical education system, despite the obligatory psychiatric rotations, the mental health education, stigmatization and its consequences do not parallel in attention toward physical health (19). Interestingly, increasing literacy about suicide among nurses leads to improved attitudes toward people who attempt suicide (18). This may ameliorate people's willingness to use mental health services.

Another significant component that may heighten or lessen social stigma is culture (19). In terms of stigma, the three main facets of culture are media, literature, and art. They are crucial in the stigmatization (or destigmatization) of mental health problems, suicidal thoughts and attempts, and those who have lost loved ones to suicide (9, 20). Iranians have a sense of humor and frequently crack jokes in response to current events and pressing social issues. Jokes that have a negative outlook on people with mental illnesses can enhance stigma (21). In addition, expressions like "if...(Something happens), I shall kill myself" are frequently used in talks and jokes. In affluent nations, one of the main objectives of culturally-based suicide prevention efforts has been to reduce stigma by raising public awareness about suicide and the adverse consequences of stigmatizing attitudes (22).

Suicide attempts and behaviors are strongly prohibited in Islam; Suicide is an unpardonable sin that guarantees a person's immediate entrance into damnation and hell. Suicide is consequently highly stigmatized in nations with a majority of Muslim population, such as Iran. Other religious societies are not exempt (23).

There are no adequate comprehensive and effective efforts in Iran to increase knowledge and awareness about mental disorders, people with mental illnesses and suicide. Sometimes the media also provoke very negative attitudes toward mental illnesses and suicide. World Health Organization has disseminated the Media Guideline for Reporting Suicide, however, Iranian online media like many other LMICs do not fully follow such recommendations (24). In addition, authorities in many countries are reluctant to report the true rate of suicide attempts and deaths, and this can be an important barrier to comprehending this complex problem, resulting in a misunderstanding of people's needs and reduced help-seeking for preventive services in high-risk populations (25). Moreover, underreporting of suicide attempts and deaths can result from the community's denial or reluctance to attribute them to suicide. That underreporting of this information can

have an impact on the provision and funding of essential suicide prevention services that may facilitate a reduction in suicide behavior and death.

Previous qualitative research indicates that personal unfavorable attitudes and views of Iranian policymakers and health authorities may have influenced their decisions to not fully implement a comprehensive stigma reduction strategy (12, 25). Another barrier to improving mental health literacy and creating and implementing prevention interventions in this area is a lack of financial resources. The financial resources are vital to sustain mental health programs or upgrade pilot programs to national level. The cost of services, lack of insurance coverage for suicide and its complications, are financial difficulties that people who have attempted suicide face to directly (26).

3. Suicide prevention efforts and challenges in Iran

In LMICs such as Iran, suicide is considered a public health problem that can be managed not only through mental health approaches, but also through comprehensive community-based and social programs. Implementation of community-based screening programs in countries such as Japan and the United States has been reported to be effective and safe in improving treatment referrals and utilization of suicide prevention services (27, 28). Accordingly, about three decades ago, the mental health integration program in Iran's primary health care (PHC) system was evaluated and implemented (29). Furthermore, Iran's national suicide prevention program was integrated into the PHC (30). In line with such initiative, a large number of clinical psychologists have been recruited to health centers affiliated with the PHC system in recent years, and play an effective role in reducing suicide (31). In the PHC, almost every client is screened for suicidal ideation by community health workers or General Practitioners (29). However, in Iran, we may need a comprehensive screening and referral program not only in primary care settings, but in public and educational settings, especially for at-risk individuals such as adolescents and young adults. However, it should be noted that, concurrent with developing suicide screening programs around the country, health professionals should be adequately educated to provide the best response to people who are at risk of suicide.

In recent years, Reform in the mental health care system has led to Iran's Comprehensive Mental and Social Health Services (the SERAJ Program) which has been implemented in some areas of the country (32, 33). Community Mental Health Centers (CMHCs) are an integral part of the program and provide services for the local community. Among CMHC's services is collaborative care with primary care providers in the health centers; the aim is to improve detection and treatment of mental disorders as well as suicide. Also, CMHCs provide aftercare services for people with severe mental disorders after discharge from the hospital, and rehabilitation services by psychoeducation and skill training (32–36).

Although suicide hotlines are an essential component of every system for preventing suicide (37), there is no national suicide prevention hotline in Iran. The State Welfare Organization of Iran offers free telephone consultations and a few medical universities provide hotline services, for all mental health concerns (38). However, to the best of our knowledge, there is no published report on number of suicidal individuals who use these free services and their effectiveness on suicide prevention.

The mental health system faces some challenges in the field of suicide prevention. One of the most obvious ones is the insufficient-allocated budget, both in health care and research. Insufficient budget leads to poor quality of care and poor access to services across the population. Consequently, effective pilot programs may not be implemented at the national level. For implementation at the national level, it needs to be integrated into the national health care services/programs. This has proved to be very difficult, if not impossible, for several reasons; among which are negative attitudes of health care policymakers toward mental disorders, insufficient governmental health care budgets, bureaucratic hurdles of integrative efforts, unsustainable resources, features of innovations that make them hard to scale, inadequate training and support staff, etc. (39). For example, in a small community trial in three districts in Iran, SERAJ was associated with improved mental health literacy and decreased prevalence of mental disorders in the intervention districts (33). After 6 years, the program has been expanded to 23 districts, however, the SERHJ program has not yet been fully scaled to a national level, despite the promising outcomes during the trial (34).

Though, this is not limited to Iran or other developing countries; it is observed in high-income countries as well; for example, Bégin et al. (40) call Canada a "country of perpetual pilot projects".

In Iran, mental health prevention programs, especially community-based ones, are not adequate for the needs of the community. More importantly, the effective strategies foreseen in these programs, such as improving the quality and quantity of the services provided, enhancing the quality of health record taking, reducing the social stigma related to public awareness, managing media reporting, and limiting access to suicide methods, have not yet been implemented at scale. Often, the cultural aspect of these programs has been neglected and there has not been proper awareness at the community level to increase mental health literacy. In addition, weak intersectoral cooperation among organizations leads to a significant reduction in the effectiveness of the programs (26, 29, 32).

Even though mental health research suffers from inadequate funding in recent years, some evidence-based suicide prevention

interventions have been carried out in Iran (41–45). However, many of these studies suffer from important methodological shortcomings that limit their applicability at the community level, such as being quasi-experimental without follow-up, being conducted on military forces personnel, or having limited sample sizes. A comprehensive community-based suicide prevention and intervention program that is supported by a range of relevant organizations (such as the Ministry of Health, Welfare Organization, and Ministry of Education, Ministry of Science) at the national level is urgently needed.

4. Discussion

Suicide is a significant and complex public health problem that needs to be carefully addressed in all its facets, including efforts to raise awareness among the society, health professionals, and policymakers, the development of a comprehensive, multi-level, and multi-directional national program, the provision of adequate funding and insurance support for mental health care, and the training of skilled professionals. Multi-level suicide prevention efforts that integrate different approaches may yield the best outcomes, but such a strategy in a country like Iran is still in its infancy, and there is much to learn and research about different suicide prevention programs and how to effectively combine them to achieve a successful model. The main challenge for research and practice involves identifying the most efficient ways to reach vulnerable people who may not benefit from current prevention and awareness programs (46). However, there are many obstacles to identifying optimal solution. Universality of stigma is the main obstacle that remains unsolved in Iran, and across the globe. Although both self-stigma and public stigma contribute to unwillingness to seek suicide prevention efforts in Iran (21), public stigma (such as gender-related myths in society, prohibition of holding funerals for suicide victims, negative judgment of people who have died by suicide as weak persons unable to cope with their problems, etc.) may have more negative effects on people and cause them to hide their suicidal thoughts and attempts. In such circumstances, many people with suicidal thoughts miss out on social and formal support programs offered by health activists and healthcare providers (21).

More recent Iranian studies have shown that most of the general population has become familiar with mental illnesses through the media and especially movies (15, 19). However, mass media in Iran, as a cultural representation of the community, does not provide information about mental health, and this can create negative attitudes toward people with mental illness. In countries such as Germany and the United States, media campaigns seek to reduce the stigma of mental health problems, increase suicide awareness, and increase help-seeking behaviors (9). Focusing on the stigma of mental health problems, these campaigns seek to change public beliefs about people with mental disorders. They also aim to improve attitudes toward mental health services and treatment. Help-seeking behaviors and attitudes play an important role in the use of services for mental illnesses. A related meta-analysis reported progressive negative attitudes toward help-seeking over the past decades, possibly due to the medicalization of mental health problems (47). In Iran, multiple centers make decisions that can affect the mental health of the public and on many occasions they do not collaborate well. Although the Ministry of Health and Medical

TABLE 1 Recommendations to reduce the stigma toward suicide and encouraging utilizing suicide prevention system.

Public level recommendations
1- Addressing stigma of psychiatric disorders and suicide by concentrating on vulnerable groups such those with mental illnesses, the youth, women, elders, and those who are struggling financially. 2- Trying to increase knowledge about mental health. Discussing one's own mental pain and thoughts of suicide but avoiding condemning those who have attempted suicide 3- Boosting public awareness of mental health through social media, instructions at schools and universities, and public gathering places like religious services or festivals. 4- Supporting the rights of those who suffer from mental disorders by social activism. Also, Social Influencers' revelation of their own suicidal experiences and how they overcame them can be helpful.
Policymakers
1- Creating strong networks between government agencies and authorities, and non-profit organizations that work to prevent suicide to save money, eliminate duplication of efforts, increase cooperation between organizations, improve coordination of care, and increase implementation capacity. 2- Maintaining policies to ensure the confidentiality and privacy of people receiving mental health services, these policies should primarily target insurance companies. 3- Promoting mental health services will lead to effective suicide prevention. It might be accomplished by raising the level of expertise of PHC mental health professionals, requiring insurance companies to pay health consequences of suicide, and offering affordable, efficient treatment approaches that are based on the most recent research for mental disorders. 4- Creating a national suicide referral system and hotline. 5- Requiring media outlets to adhere to and monitor WHO reporting guidelines for suicide. The use of hotlines and mobile applications can be promoted in suicide prevention advertising efforts on social media and platforms like Instagram, offering dependable and useful support for those at risk of suicide. 6- Suicide prevention methods should be modified to account for local culture and ecosystem. It implies that the suicide prevention system needs to be revised for susceptible groups, such as mental health professionals or communities with distinctive characteristics. 7- Providing consumers with educational material could be a crucial intervention strategy. These readily available alternatives would be helpful to a lot of people, but in order to best serve the wide user base, these programs would need to be modified to include different languages, cultural perspectives, and geographic features (51). 8- Iranian Early Career psychiatrist might encourage a national and international cooperative network to create studies and provide guidelines to reduce stigma associated with mental illnesses and to launch new strategies for promoting mental health. 9- To examine the suicide as a public health problem and to develop powerful preventative measures, a mix of qualitative and quantitative research is suggested.

Education is considered the leading organization responsible for public mental health, it has limited budgets and power to take care of mental health of the whole country. Therefore, in Iran, we need the cooperation of organizations and authorities to develop suicide prevention campaigns and encourage non-governmental associations to implement the formulated strategies.

Religious and cultural factors should be considered to reduce suicide stigma, which calls on experts in these fields to work together. There is an initiative in Indonesia in which religious leaders attempted to de-stigmatize mental disorders and suicide in order to establish a national suicide prevention strategy (48). Similar measures can be taken in Iran as a Muslim country. In addition, we should not forget important informal sources of support (i.e., family and friends) to de-stigmatize suicidal thoughts and normalize help-seeking. By providing proper education, these sources can help develop the protective actions in an individual's life by assisting the person to reinforce supportive relations and life skills. These sources provide support and listen to people experiencing suicide, understand their feelings, talk to them, encourage them to seek and adhere to preventive treatments and help them stay safe in crises (49, 50).

We have provided some recommendations to reduce suicide stigma and encourage utilization of suicide prevention programs in the society and government levels in Table 1. Since suicide can be prevented, we urgently need to change the attitude of the public and policymakers through national educational programs. We also need to adapt appropriate strategies for suicide prevention focusing on protective factors, such as cultural strengths, family ties, spirituality, etc.

Data availability statement

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

Author contributions

MM and FS: conceptualization and writing first draft. SH, VS, AJ, and SS: critical revising and writing of the final version. All authors contributed to the article and approved the submitted version.

Conflict of interest

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

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Publisher's note

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Attitudes of medical students toward psychiatry in Eastern Mediterranean Region: A systematic review

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Background: Psychiatry is facing one of the highest levels of shortages among medical specialties. Stigma toward psychiatry plays an influential role in medical students' decision to choose psychiatry as a career and has been reported to be prevalent in different parts of the world, particularly in low/middle-income countries.

Objective: To systematically review the Eastern Mediterranean Region (EMR) medical students' attitudes toward psychiatry, to assess whether their attitudes are stigmatized or not, and the factors affecting their attitudes.

Method: PubMed, Scopus, Web of Science, and PsychInfo (PsycARTICLES) were searched using a combination of main terms "stigma," "psychiatry," "medical students," and the name of Eastern Mediterranean countries. Cross-sectional studies assessing the attitudes of EMR medical students toward psychiatry were included in this review.

Results: Ten studies were eligible to be included in the result synthesis. These were from Pakistan ($n = 3$), Iran ($n = 2$), Saudi Arabia ($n = 1$), Lebanon ($n = 1$), Egypt ($n = 1$), Bahrain ($n = 1$), and Oman ($n = 1$). Most studies reported a combination of both positive and negative attitudes among medical students; however, the overall attitude was positive. Factors affecting medical students' attitude toward psychiatry included poor psychological well-being, having a friend with a psychiatric illness, involving in a romantic relationship with someone suffering from mental illness, young age, frequency of exposure to psychiatry clerkship/teaching, and quality of psychiatry clerkship. Nevertheless, the final positive or negative outcome of these factors on students' attitudes remained controversial.

Conclusion: Considering the lack of sufficient data from most EMR countries, we need to exercise caution in interpreting the results of this review. Nevertheless, our review indicates that psychiatry is not stigmatized among EMR medical students, and they have generally positive attitudes toward it. The findings of studies evaluating influencing factors are contradictory and demand further exploration.

KEYWORDS

psychiatry, stigma, attitudes, medical students, Eastern Mediterranean Region (EMR)

Introduction

Mental health, according to WHO, is conceptualized as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal life stress, can work productively and fruitfully, and is able to make a contribution to his or her community" (1). There are, however, alterations from this state in one out of four individuals (2, 3). The magnitude of psychiatric disorders has been under intense scrutiny. The Global Burden of Diseases, Injuries, and Risk Factors Study 2019 (4), sheds light on the considerable burden of mental disorders, being among the top ten causes of burden globally, with no evidence of improvement since 1990. The current COVID-19 pandemic has further complicated the situation. There are reports of increased psychiatric disease incidence, along with exacerbations of preexisting mental disorders associated with pauses or changes in the patients' routine care during the pandemic (5–7). This significant and growing burden necessitates an enhanced level of alertness. However, psychiatry is experiencing a "recruitment crisis" across the world, especially in low/middle-income countries, not to mention Eastern Mediterranean Region (EMR) (8–12). This crisis has markedly exacerbated the existing *treatment gap*, without being effectively addressed by worldwide policymakers.

Psychiatry is facing one of the highest levels of shortages among medical specialties (13). Considering the UK alone, the royal college of psychiatrists is calling for 7,000 more places in medical schools (14), and the US is expected to experience a 21,000 shortage of psychiatrists by 2030 (15). The extent of the situation, however, varies greatly among nations, with as low as 0.1 psychiatrists and 1 psychiatrist per 100,000 population in low-income and EMR countries, respectively, compared to more than 8 psychiatrists per 100,000 population in high-income countries (16).

Among multiple factors influencing the decision to choose psychiatry as a career, perception of psychiatry plays an essential role (17). Stigma toward psychiatry has been reported to be prevalent in different parts of the world, particularly in low/middle-income countries (18–20). Psychiatry has been perceived to be less scientific and prestigious, with lower treatment efficacy than other specialties (17, 21). Awareness of this stigmatized view has prompted worldwide researchers to investigate the attitudes of medical students toward psychiatry in an attempt to deepen the comprehension of the situation and influencing factors. Accordingly, factors affecting medical students' choice of career and attitude toward psychiatry include but no limited to the quality of psychiatric clerkship, the perceived attractive lifestyle of psychiatrists, the improvement seen in affected individuals after treatment, the influence from role models, family and personal history of mental illness, and certain personality traits (e.g., openness to experience) (22–25). Notably, some studies have highlighted the influence of cultural, social, and regional factors (19, 26, 27).

WHO's EMR contains 22 countries with a population of 645 million and distinct socioeconomic and health challenges (28). Prolonged emergencies have disabled the health systems of some of these countries while affecting most other neighboring nations. This may be reflected in the substantially high prevalence of mental illnesses and substance use disorders in these countries (29). Barriers to universal health coverage, health workforce maldistribution and availability, and issues related to rural workforce retention all indicate incompetent policies and provoke growing alarm regarding the state of health systems in the EMR region (30). Therefore, these countries need active support to develop national plans and achieve the United Nations Sustainable Development Goals.

A review of international medical students' attitudes toward psychiatry found highly negative opinions toward psychiatry as a career (19). This finding is supported by Lyons, who observed the same pattern in global medical students (18). However, little is known about the attitudes of EMR medical students toward psychiatry and it is not clear which factors may influence their attitudes.

In order to develop requisite policies tackling mental health issues, documentary evidence of students' stigma toward psychiatry and related factors is an absolute obligation for every country. Considering EMR countries and the challenges they face within the realm of mental health disorders, providing such evidence becomes even more critical. Hence, given the abovementioned uncertainties about EMR medical students, we aim to systematically review the studies focusing on the attitude of medical students toward psychiatry in EMR and the factors affecting it.

Methods

Pre-registration and search strategy

The protocol of this systemic review was registered on the Open Science Framework (OSF) registry (Registration doi: 10.17605/OSF.IO/3M2UW). The systematic review followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA 2020) (31). We searched PubMed, Scopus, Web of Science, and PsycINFO (PsycARTICLES). In addition, reference lists of all eligible publications were searched using citation tracking sources (Google Scholar) to ensure a comprehensive search. We started searching on March 20, 2022 and updated it toward the end of the review. The last search occurred on May 6, 2022. No filter was applied regarding the language, type, or publication year of the articles in the search strategy. We used a combination of the main terms "stigma," "psychiatry," "medical students," and the names of each EMR country (32) in all the above-mentioned databases. The search strategies for all databases are available in Supplementary material (Supplementary Tables 1–4).

Eligibility criteria

Studies with the following criteria were included in this review. The same criteria were applied for both phases of the selection process (title/abstract screening and full-text review):

- Population: We included studies targeting undergraduate medical students and excluded studies involving residents, graduated medical students, medical doctors, and other groups not considered undergraduate medical students.
- Outcome: We included studies evaluating the attitudes of medical students toward psychiatry in EMR.
- Context: We included studies focusing on WHO's EMR countries (32), including Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Occupied Palestine Territory, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic (Syria), Tunisia, United Arab Emirates, and Yemen.
- Types of studies: We included cross-sectional studies and excluded other study designs such as review articles, cohorts, case controls, and clinical trials, but reference lists of review articles were checked for eligible studies. Non-English and non-Persian publications were excluded in the screening process.

Selection process

For the purpose of de-duplication, record screening, and other citation management processes, reference management software was used.

The title and abstract of the reports were screened by two independent reviewers (FG, MM). Studies fulfilling inclusion criteria or having any uncertainty regarding their eligibility were considered for full-text review. Following title/abstract screening, two reviewers (NN, MM) independently assessed the full texts of the reports against the inclusion criteria and recorded the reasons for exclusion at this stage. Consensus or referring to a third reviewer (FG) resolved the controversies. Identifying information of the studies was visible to the screeners.

Data collection process

Two investigators (NN, MM) extracted the required data using a standardized Excel spreadsheet, and a third verified the process (FG). We conducted a calibration exercise to maximize consistency among reviewers. Corresponding authors were contacted if there was any missing information.

Extracting variables were established through discussion. We extracted the following data: article characteristics (e.g., first author, country of origin, year of publication), response rate, mean age, number of participants, number of male participants, scales used for assessing the stigma/attitudes, mean scale score, predictors of the stigma/attitudes, limitations, and the main results.

We used mean scores of the questionnaires and standard deviation to interpret and present results. By an online tool (33), we pooled the results of those studies using the original version of the ATP-30 questionnaire and reported both mean scores and standard deviations.

Risk of bias (quality) assessment

Joanna Briggs Institute's (JBI) critical appraisal checklists for analytical cross-sectional and prevalent studies (34, 35) were used for risk assessment in this review. After a calibration session, two independent reviewers (NN, MM) assessed the quality of the studies. Controversies were resolved by discussion or referring to a third party. The JBI Critical Appraisal Tools were used to assess the methodological quality of studies and to determine the extent to which they have addressed bias possibility. For prevalence studies, the JBI checklist includes nine questions regarding sample frame, sampling process, sample size, setting description, condition identification and measurement, statistical analysis, and response rate. Point 1 is for "yes" answers, while point 0 is for "no," "unclear," or "not applicable" answers. After discussion, the authors set a threshold of 5 for prevalence studies to be included in the review. For analytical cross-sectional studies, the JBI checklist includes eight items with questions regarding inclusion criteria, setting description, confounding factors, statistical analysis, exposure, condition, and outcome measurement. The authors agreed on a threshold of 4 for the inclusion of analytical cross-sectional studies.

Results

Study selection

The systemic search of databases resulted in 346 citations. Following deduplication ($n = 73$), 273 records underwent title/abstract screening, of which 29 studies were considered for full-text review. Finally, considering one additional report retrieved through searching reference lists of included studies and related reviews, the searching process produced 11 studies. Excluding one report due to the risk of bias, a total of 10 reports were included in the final discussion. Figure 1 depicts the PRISMA diagram of the selection process. We excluded pre/post surveys assessing the effect of psychiatry clerkship on the medical students' attitudes toward psychiatry (22, 36–42) because their primary aim was not in line with this review, and

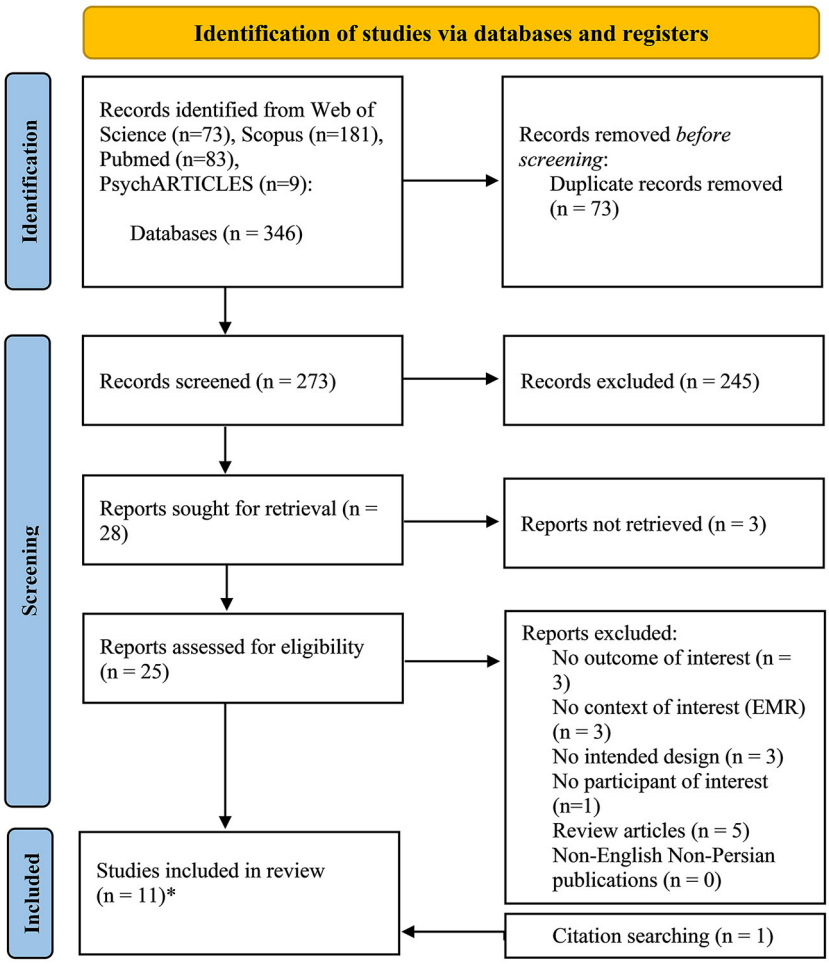

FIGURE 1
The PRISMA diagram presenting the procedure of literature searching and selection with numbers of articles at each stage. *One of these studies was not included in the final discussion due to the risk of bias regarding our review question.

their different study designs would have contributed to increased heterogeneity of included studies.

Characteristics of studies

For assessing the attitudes of medical students, the most frequently used measurement was the Attitudes Toward Psychiatry-30 items (ATP-30) questionnaire (n = 9) (43–51). Toudehskchuie et al. (49, 50) customized the questionnaire for their pre-clinical participants and omitted items related to psychiatric knowledge and teaching. Other measurements included Attitudes Toward Psychiatry-18 items (ATP-18) (52) and a questionnaire adapted from Feifel questionnaire (27). The study using the former questionnaire was not included in the final discussion due to the risk of bias regarding our review question. This study was an international survey containing one of the EMR countries (Iraq) but did not provide details about the response of Iraqi students, and hence was prone to the risk of bias with regard to our review question.

ATP-30 is a widely used questionnaire consisting of 30 items introduced by Burra et al., with adequate validity, reliability, and good internal consistency (Cronbach's alpha = 0.874) (53). It has four major sections: attitudes toward psychiatric patients and psychiatric illness, psychiatrists and psychiatry, psychiatric knowledge and teaching, and finally psychiatric treatment and hospitals. Answers to the questions are provided based on a five-point Likert scale (strong disagreement, disagreement, neutral, agreement, strong agreement). Scores above 90 indicate a positive attitudes, scores below 90 indicate negative attitudes, and 90 demonstrates a neutral attitude. One of the studies used an adapted version of the Feifel questionnaire, consisting of 24-item and a few open-ended questions (27). The items

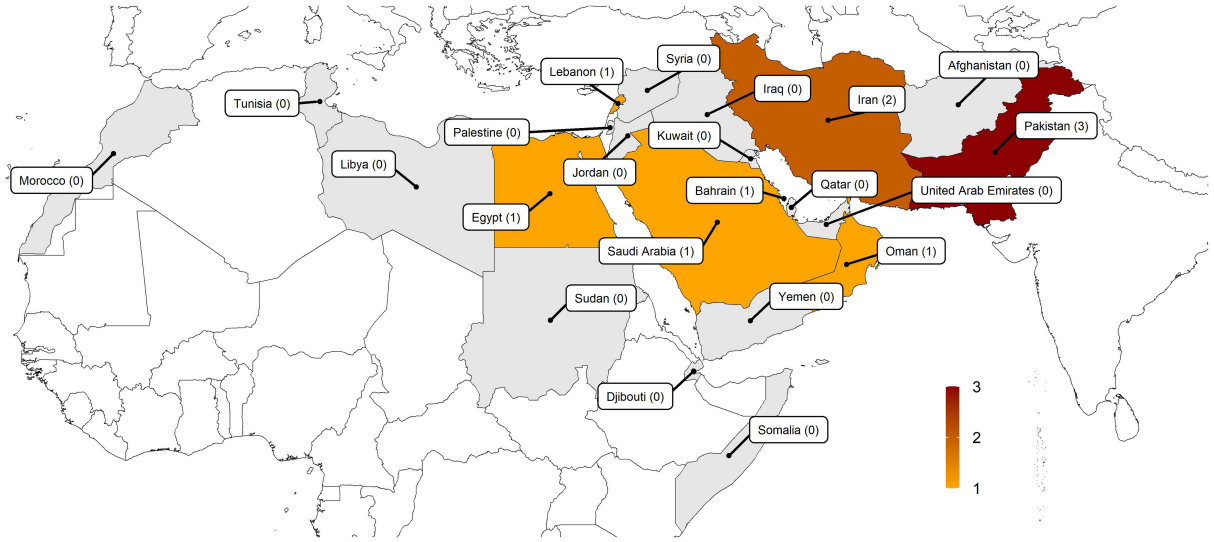

FIGURE 2
Geographical distribution of the included studies (the cross-sectional studies conducted in the Eastern Mediterranean Region reporting the attitudes of medical students toward psychiatry).

ask about the demographic background of the participants, students' perceived important factors in the choice of a specialty, students' priorities of specialty choice, and students' opinions regarding different aspects of specialties such as financial reward, lifestyle, job satisfaction, challenges, prestige in the medical community, prestige in the general public, bright future, scientific foundation, etc. The scoring was based on a five-point Likert scale from 1 = very attractive to 5 = extremely unattractive. There is no reliability/validity data available for this questionnaire (27, 54).

Regarding the geographical distribution of the reports, the studies were conducted in seven different countries within the EMR; three studies came from Pakistan (27, 44, 48), two from Iran (49, 50), and others from Saudi Arabia, Lebanon, Egypt, Bahrain and Oman (n = 5) (43, 45–47, 51). Figure 2 depicts the geographical distribution of the reviewed studies.

The sample size ranged from 130 to 635, with a total population of 3,567. Two studies included only clinical final year medical students (27, 44), one included pre-clinical students (49), and others included a combination of both clinical and pre-clinical students (43, 45–48, 50, 51). About twenty medical schools participated in the surveys. Seven studies conducted uni-center surveys (43, 46–51) and others, excluding one that did not specify (52), conducted multicenter surveys with a minimum of 2 centers and a maximum of 7 (27, 44, 45). The response rate ranged from 11% to 100%, with rates of over 80% in seven studies (63% of total studies).

Seven studies adopted the convenient sampling technique and recruited the participants in a classroom, before or after lectures, or in the hospitals, before or after rotations (27, 44, 46–51). One study adopted voluntary response sampling (45) and conducted an online survey. Another study did not specify the sampling method and how the questionnaires were distributed (43). With regard to publication year, the most recent report was published in 2021 (45), and the oldest report dates back to 2002 (47). Four studies were published in 2016 or afterward (43, 45, 46, 51), while others were published before this year. Table 1 shows the characteristics of the reviewed studies.

Summary of results

A combination of both negative and positive attitudes toward psychiatry was reported in most studies. The overall findings, however, revealed a quite positive attitude. Factors that appeared to positively affect attitude toward psychiatry included involving in a romantic relationship with someone suffering from mental illness, young age, and outside-school exposure to materials and information related to psychiatry. However, the association of attitude toward psychiatry with gender (female), academic year, exposure to psychiatry clerkship, personal history of mental illness and having a relative and/or friend with a psychiatric disease remained controversial between studies. There was not any association between attitude toward psychiatry and having a psychiatrist relative,

TABLE 1 The general characteristics of the included articles in the review of studies assessing the stigma toward psychiatry among medical students in the Eastern Mediterranean Region.

First author	Country	Sample size	Response rate (%)	Male respondents	The academic year of the study population	Age, mean (Standard Deviation)	Scale
El Hage et al. (45)	Lebanon	607	10.83	257 (42.7%)	1–7	NM	ATP-30
Alzahrani (43)	Saudi Arabia	317	100	121 (38%)	Mixed	22.4 (1.55)	ATP-30
Shalaby (46)	Egypt	400	100	178 (44.5 %)	2,4,6,7	21.18 (2.1)	ATP-30
Al Qubtan et al. (51)	Oman	269	90.4	100 (37%)	Mixed	NM	ATP-30
Toudehskchuie et al. (49)	Iran	130	83.07	66 (61.11%)	Pre-clinical	20.36 (2.09)	ATP-30
Toudehskchuie et al. (50)	Iran	220	67	56 (37%)	Mixed	20.84 (2.09)	ATP-30
Khan et al. (44)	Pakistan	281	100	165 (58.3%)	Final year	NM	ATP-30
Syed et al. (27)	Pakistan	635	60	164 (43.0%)	3	21.00 (1.11)	Adapted from Feifel's questionnaire
Maqsood et al. (48)	Pakistan	538	100	240 (44.60%)	1, 4	NM	ATP-30
Al-Ansari et al. (47)	Bahrain	170	82.3	49 (35%)	1, 4, 7	20.57 (2.52)	ATP-30

religiosity, having a relative with alcohol or drug dependency, and significant family problems. Table 2 summarizes the main findings of the reviewed studies, and Table 3 summarizes factors affecting attitudes toward psychiatry. Five studies (43, 45–47, 51) reported both mean scores and standard deviations, using the original version of ATP-30 questionnaire, while the other five used another questionnaire, a modified version of ATP-30 questionnaire or not reported both mean and SD, therefore were excluded from the pool. The pooled result of these five eligible studies indicated that the score of EMR medical students on ATP-30 questionnaire is 104.52 ± 13.75, which is above 90 and indicates a positive attitude. Six studies reported the percentage of students considering psychiatry as their future career (27, 45–47, 49, 50) ranged from 7.6% to 38%, with rates of over 25% in five studies.

Risk of bias assessment

We used JBI Critical Appraisal Checklists for prevalence and analytical cross-sectional studies for bias risk assessment of included studies. Accordingly, one study did not meet the predefined threshold score (the study score = 3) and was excluded due to the risk of bias (52). Supplementary Tables 5, 6 provide a summary of the risk of bias assessments.

Discussion

Summary of main findings

With the growing prevalence of psychiatric disorders threatening health systems and an inadequate proportion of medical students choosing psychiatry as a career, special attention should be paid to the students' attitudes toward psychiatry, their career choices, and related trends. This issue is even more crucial for EMR countries, considering the challenges their health systems face. In this regard, we systematically reviewed studies focusing on medical students' attitudes toward psychiatry, associated stigma, and the factors influencing their attitude. This review indicated that the attitudes of EMR medical students toward psychiatry are not stigmatized and are generally positive.

Compared with previous studies documenting negative attitudes toward psychiatry, what has changed over the years might be that various aspects of psychiatry have progressed and the field is rapidly expanding (4, 48, 55): accessible scientific evidence establishing psychotherapeutic treatments' effectiveness; the development of psychosomatic medicine applying to all medical diseases; improved quality of psychiatry teaching; growing prevalence of psychiatric diseases resulting in more exposure to the mentally-ill patients; and involvement with the acutely disturbed as well as successful cases of psychiatry may have exposed students to significance and advantages of

TABLE 2 Main findings of the included articles in the review of studies assessing the stigma toward psychiatry among medical students in the Eastern Mediterranean Region.

First author	Mean scale score (SD)	Males' mean scale score	Females' mean scale score	Factors with insignificant association with attitudes	Factors with a significant effect on attitudes	Limitations	Main results
El Hage et al., (45)	111.95 (12.55)	NM	NM	Gender, religiosity, academic year, studying in private or public universities	Being acquainted with a psychiatric patient, poor psychological well-being	Selection bias leading to a non-representative sample since the questionnaire has been sent electronically to medical students; the lower response rate in sixth and seventh medical students, and low response rate from certain universities, which make the generalization difficult.	Ninety-five percent of the participants had a positive attitude^{+} toward psychiatry, and 26.5% of them considered psychiatry as a potential career choice.
Alzahrani (43)	96.49 (3.30)*	94.44 (2.55)	97.77 (3.07)	Having a psychiatrist relative, having a relative with a psychiatric illness	Gender (female), exposure to psychiatric clerkship	Participants from only one institute	There was a general finding of a positive attitude^{+} toward psychiatry. Psychiatry as a future career was still unpopular among male students. Exposure to psychiatry clerkship and gender were the most effective predictors.
Shalaby (46)	99.31 (15.89)	NM	NM	Gender (There was no significant difference between males and females, but females had higher ATP-30 scores)	NA	The study was done in only one Egyptian medical school and at a one time-point. Sampling included only the students in four preselected years and did not include first, third, and fifth-year students	Seventy-six percent of the students had positive attitudes^{+} toward psychiatry and 29.5 % considered psychiatry as a potential career choice.
Al Qubtan et al. (51)	104.20 (12.02)	NM	NM	Gender, experience in the psychiatry rotation, suffering from mental illness, having a relative or friend with mental illness, academic year	NA	Uni-center	The students had an overall positive attitude^{+} toward psychiatry, but none of the studied factors predicted the students' attitude toward psychiatry.
Toudehskchuie et al. (49)	66.00 (8.86)	NM	NM	Gender (No significant difference was reported between males' and females' ATP-30 scores, but females had higher scores)	NA	Uni-center, questionable reliability and validity of the translated questionnaire	Female preclinical students had more positive attitudes than their male counterparts.

(Continued)

10.3389/fpsyt.2022.1027377

TABLE 2 (Continued)

First author	Mean scale score (SD)	Males' mean scale score	Female's mean scale score	Factors with insignificant association with attitudes	Factors with a significant effect on attitudes	Limitations	Main results
Toudehskchuie et al. (50)	Clinical students: 81.55 (12.82)* preclinical students: 62.5 (7.16)	NM	NM	Gender (in pre-clinical students)	NA	Uni-center, questionable reliability and validity of the translated questionnaire	Pre-clinical students generally showed more positive attitudes than their clinical counterparts. In addition, female clinical students had more positive attitudes than their male counterparts.
Khan et al. (44)	100.6*	98.56*	103.51*	Gender	NA	-	The results show an overall positive attitude^{+} of the students toward most aspects of psychiatry.
Syed et al. (27)	NM	NA	NA	NA	NA	-	A small number of students reported psychiatry as their specialty of choice.
Maqsood et al. (48)	98.56*	96.7*	100.02*	NA	NA	Uni-center	The students had a positive attitude^{+} toward psychiatry.
Al-Ansari et al., (47)	105.79 (13.34)	100.63*	108.59*	Student perception of teaching quality, exposure to clinical psychiatry, visiting the psychiatric hospital, relationship with mental health professionals, having a psychiatric illness, having relative with alcohol or drug dependency, significant family problems, unpleasant experience with mental health personnel	Exposure to material related to psychiatry, having a friend with a psychiatric illness, having a romantic relationship with someone who had a psychiatric illness, young age, gender (female)	-	The students had a moderately positive attitude^{+} toward psychiatry, with a better attitude among female, younger and junior students.

NA, not assessed; NM, not mentioned; ATP, attitudes toward psychiatry; SD: standard deviation. *Not mentioned explicitly and were calculated by the authors of the present review; $^{+}$according to the ATP-30 questionnaire, scores above 90 indicate a positive attitude.

10.3389/fpsyt.2022.1027377

TABLE 3 Summary of factors affecting attitudes toward psychiatry in the review of studies assessing the stigma toward psychiatry among medical students in the Eastern Mediterranean Region.

Association \ Study	Hage, 2021	Alzahrani, 2019	Shalaby, 2016	Al Qubtan, 2016	Toudehskchuie, 2012	Toudehskchuie, 2012	Khan, 2008	Syed, 2008	Maqsood, 2006	Al-Ansari, 2002	Total Insignificant and Significant Associations (out of 10 studies)	
Gender											6	2
Personal history of mental illness											2	1
Having a relative and/or friend with a mental illness											2	2
Having a relative with drug/alcohol dependency*											1	0
Psychiatry clerkship											2	1
Religiosity											1	0
Studying in private or public universities											1	0
Having a psychiatrist relative											1	0
Academic year											2	1
Significant family problems											1	0
Unpleasant experience with mental health											1	0
Romantic relationship with someone having a psychiatric illness											0	1
Unpleasant experience with mental health personnel											1	0
Outside-school exposure to materials related to psychiatry											0	1
Age											0	1
Visiting psychiatric hospital											1	0

Significant association: Insignificant association: Not studied: . *Drug/Alcohol dependency can be considered a type of mental illness, but Al-Ansari's study distinguished between drug/alcohol dependency and mental illness.

psychiatry and challenged commonly held stigmatized view toward it.

In total, studies were originating from 7 different EMR countries (Pakistan, Iran, Saudi Arabia, Lebanon, Egypt, Bahrain, and Oman), lacking data from the other 15 countries. The reviewed studies generally had high response rates, which can be attributed to the participant recruitment method used in most of them, the convenient sampling technique. The results of this review indicate that medical students' attitudes toward psychiatry are generally positive in EMR countries. Our findings regarding attitudes of medical students are consistent with Lyons' (18) review of medical students' attitudes toward psychiatry encompassing 32 studies from 22 different countries across five continents, which demonstrated a generally positive attitude toward psychiatry among medical students of those countries. This is not in line with the traditional view of prevalent stigmatized attitudes in developing countries, especially in Asia (56). Indeed, EMR medical students (ATP-30 score = 104.52 ± 13.75), while generally scoring lower than medical students of developed countries such as Switzerland, Austria, Hungary, and Germany on the ATP-30 questionnaires (European ATP-30 sum score = 111.42 ± 13.35), had comparable attitudes to them (57). However, considering developing countries in other parts of the world, EMR medical students had more positive attitudes toward psychiatry than Ethiopian (ATP-30 score = 52.39 ± 13.2), and Indian students (ATP-30 score = 89.83 ± 11.8) (58, 59). Nevertheless, the same trend was not observed in the developing countries of other parts of the world as Indonesian, South African, Malaysian, and Nigerian medical students had overall the same or comparably more positive attitudes than the EMR countries EMR ATP-30 score = 104.52 ± 13.75 (60–63). This may be partly explained by differences in cultural background and personality traits (64). None of the included studies examined the effect of culture and personality traits on attitudes toward psychiatry. Within EMR, however, higher healthcare financing, Gross Domestic Product (GDP), and even health expenditure as a percentage of GDP did not guarantee better attitudes, as low- or middle-income countries such as Iran, Egypt, Lebanon, and Pakistan generally had the same situation

as higher income countries such as Saudi Arabia, Bahrain, and Oman (65, 66).

The impact of having the experience of psychiatry clerkship on students' attitudes was mixed in EMR countries. The reviewed studies did not provide a detailed description of the course and the curriculum, but the quality of the clerkship and the duration of exposure to clerkship might have played a role. The impact of psychiatry clerkship on medical students' attitudes toward psychiatry has been the subject of debate. A review by Lyons indicated a mix of both positive and neutral effects of psychiatry clerkship (18). Among the countries reporting beneficial effects of psychiatry clerkship, no relationship of this outcome with the country's status of culture, general health, or other features was described. In contrast, Farooq et al. (25), in their narrative review of factors attracting medical students toward psychiatry, reported improved attitudes following psychiatry clerkship. However, none of their reviewed studies documented stigma before clerkship. This implies that clerkship further improved previously positive attitudes, rather than reducing stigmatized attitudes. This influential role is supported by Qureshi et al. (67) review of the impact of psychiatry clerkship on attitudes toward psychiatry. Comparably, they indicated improved attitudes after the clerkship, but there was no consistency in the evidence in terms of the long-term effectiveness of the rotation. Students gaining improved attitudes had positively rated the quality of their course, been involved in in-patient care, seen a response to treatment, and received encouragement from consultants during the clerkship.

Gender differences did not predict better attitudes toward psychiatry in our review. In contrast to our results, Velikić (19), in a review of 42 studies from more than 40 countries worldwide, reported female gender as a possible predictor of better attitudes; making a strong prediction, however, may be difficult in the face of much heterogeneity among studies. In consistent with our review, Warnke et al. (57), in their survey of four European countries, have not described a substantial gender-based difference concerning students' attitudes toward psychiatry. This is further supported by the findings of Qureshi et al. (67) review, which reported inconsistency among the studies in the findings of gender correlations.

Not all of the included studies provided the percentage of students who considered psychiatry as their career. Regardless, psychiatry was not an unpopular career choice. This is in contrast to the Nortje et al. (20) review that demonstrated the low popularity of psychiatry as a career among medical students in lower-income countries; however, most of their included studies were not conducted in EMR. In our review, considering psychiatry as a future career was associated with positive attitudes, a finding consistent with that of Nortje et al.

Exposure to mental illness, either self-afflicted or having a friend or relative with mental illness, is another presumed predictor of better attitudes (25). Findings in EMR countries concerning the impact of exposure to mental illness are contradictory. Nevertheless, positive correlations with having a mentally-ill friend or relative could be seen in countries with a relatively higher prevalence of mental illness (29).

Limitations

Some factors may limit the generalizability of the results of this review. A number of the included studies face limitations regarding their sample sizes and most of them were not multicenter. Furthermore, the small number of available studies and lack of studies from most EMR countries can restrict the results of this review. Therefore, we exercise caution in interpreting the findings of the review and generalizing them. Finally, studies were not homogeneous in terms of their publication year and the results of the review may not reflect the current status of medical students' attitudes in EMR. In addition, none of the included studies addressed effects of socioeconomic factors such as culture and country incomes on attitudes of students toward psychiatry and effects of these factors remain to be explored.

Furthermore, we limited publications to English and Persian languages; however, we did not encounter eligible publications from other languages in our searches. Hence, despite this limitation, the scope of literature in our review remained intact.

Conclusion

The results of our study showed that the attitudes of EMR medical students toward psychiatry were generally positive. Several factors may mediate their attitudes toward psychiatry, but the study findings were contradictory. These factors included the experience of psychiatry clerkship, history of mental illness or having a relative with mental illness, and female gender. Findings from this review indicated an apparent lack of sufficient information about the attitudes of medical students toward psychiatry in most EMR countries. We suggest regional and cross-country collaborations for greater studies assessing attitudes of medical students toward psychiatry, and special effort is required for the conduction of studies exploring medical students' attitudes toward psychiatry in most of EMR countries lacking such data.

Protocol deviations

In addition to English publications, we included two Persian studies which is against the registered protocol (Registration doi: 10.17605/OSF.IO/3M2UW), in which non-English language studies planned to be excluded. This happened because these were the only non-English publications we had in our search, and since Persian is the first language of the authors, there was no difficulty in extracting the data.

Data availability statement

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

Author contributions

HM and NN designed the study. MM designed the search strategy and ran the search. MM, FG, and NN were involved in the screening, data extraction, and quality assessment process. NN and MM designed the geographical distribution and PRISMA diagram figures respectively. MM and FG designed the tables. HM and MM contributed to the data synthesis. MM, NN, FG, AK, and HM contributed to the protocol development. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2022.1027377/full#supplementary-material

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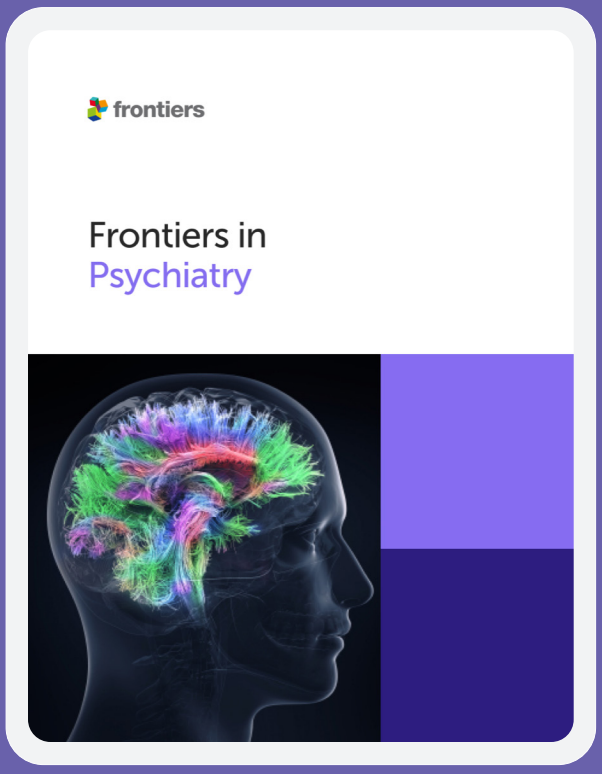

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