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Posttraumatic Stress Disorder Among the Lebanese Population and Syrian Refugees: A Systematic Review

Jana El Husseiny[1], Sarah H. Farran[2], Walaa G. El Sheikh[3, 4], Yara Yehya[3], Samer El Hayek[5], Hussein El Husseiny[6], Layal Hneiny[7, 8], Shima Shahjouei[9], Mirna Sabra[1], and Firas Kobeissy[3, 10]

[1] Neuroscience Research Center, Faculty of Medicine, Lebanese University
[2] Faculty of Health Sciences, American University of Beirut
[3] Department of Biochemistry and Molecular Genetics, Faculty of Medicine, American University of Beirut
[4] Biostatistics Unit, Clinical Research Institute, American University of Beirut Medical Center
[5] Department of Psychiatry and Behavioral Sciences, Jackson Health System, University of Miami Miller School of Medicine
[6] Medical School, New Vision University
[7] Saab Medical Library, American University of Beirut
[8] Wegner Health Sciences Library, University of South Dakota
[9] Neurology Department, Neuroscience Institute, Geisinger Health System, Danville, Pennsylvania, United States
[10] Program for Neurotrauma, Neuroproteomics & Biomarkers Research, Department of Emergency Medicine, University of Florida

Introduction. Posttraumatic stress disorder (PTSD) is a severe and disabling condition that can lead to functional impairment and decreased productivity. The purpose of this systematic review was to compile and evaluate existing research on PTSD in Lebanon and among Syrian refugees. ***Method.*** We searched the databases OVID Medline, EMBASE, and PsycINFO for articles that used validated tools to report the screening or diagnosis of PTSD among our population of interest. ***Results.*** We included 102 articles out of a total of 10,367 screened manuscripts. We identified 24 studies discussing PTSD in the Lebanese population and 78 among Syrian refugees. A total of 90 studies described the epidemiological characteristics of PTSD while 12 assessed different treatment options. There was no significant difference in PTSD rates between males and females. We also identified several risks and protective factors for developing PTSD. The former included female gender, marriage, older age, and exposure to war. ***Conclusion.*** PTSD among Lebanese individuals and Syrian refugees is multifactorial in nature, but commonly involves war-related events. There is a significant evidence gap regarding intervention strategies in this population group. Targeted, multidisciplinary, and holistic interventions are required.

Clinical Impact Statement
This study provides the epidemiology of PTSD among the Lebanese population and Syrian refugees, as well as its characteristics, risk factors, and protective factors. The results can help develop benchmarks for examining the current PTSD quality of healthcare, as well as help guide physicians and policymakers in optimizing care in the field. Results also highlight the need for strategic guidelines to improve PTSD management and treatment, as PTSD rates are high in these populations.

Keywords: posttraumatic stress disorder, Lebanon, Syria, refugees

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Posttraumatic stress disorder (PTSD) significantly contributes to the global burden of mental health disorders, affecting an estimated 26.51% of war survivors (Hoppen et al., 2021). In the Diagnostic and Statistical Manual (DSM-5), PTSD is defined as a stressor-related disorder that occurs when an individual is exposed to a traumatic event and develops intrusion symptoms associated with the

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Walaa G. El Sheikh https://orcid.org/0000-0002-4890-0222
Samer El Hayek https://orcid.org/0000-0002-7975-6104
Firas Kobeissy https://orcid.org/0000-0002-5008-6944

Jana El Husseiny served as the lead for writing–original draft. Sarah H. Farran served in a supporting role for writing–original draft. Walaa G. El Sheikh has contributed to formal analysis and visualization equally and served in a supporting role for writing–original draft. Yara Yehya served in a supporting role for writing–original draft. Hussein El Husseiny served in a supporting role for writing–original draft. Layal Hneiny served as the lead for methodology. Mirna Sabra served in a supporting role for writing–original draft. Firas Kobeissy served as the lead for conceptualization and writing–review and editing. Samer El Hayek and Shima Shahjouei have contributed to writing–review and editing equally.

Correspondence concerning this article should be addressed to Firas Kobeissy, Department of Emergency, University of Florida, Gainesville, Florida, United States. Email: firasko@gmail.com

event, avoidance of related stimuli, negative changes in cognition and mood, and marked alterations in arousal and reactivity. These symptoms occur for more than 1-month duration (American Psychiatric Association, 2013).

PTSD is a public health problem with far-reaching consequences on affected individuals and healthcare systems, and a mental health burden and societal costs (Atwoli et al., 2015). The prevalence of PTSD varies greatly across populations: it was reported to be 0.3% in China, 2.5% in Iraq, 3.4% in Lebanon, and 9.2% in Canada (Dückers et al., 2016). Its prevalence reached 22% among people living in Sub-Saharan Africa, with higher rates in participants residing in war-exposed regions (30%) compared to war-unexposed regions (8%; Ng et al., 2020). Another study of adult war survivors found that 23.81% met the diagnostic criteria for PTSD; the majority of them lived in low-to-middle-income countries with limited resources to treat the associated mental health burden (Hoppen & Morina, 2019).

The Middle East and North Africa (MENA) region has endured numerous wars, political violence, natural disasters, occupation, and forced displacements over the last few decades. The psychological distress caused by repeated exposure to extreme forms of trauma has put millions of civilians and combatants in the MENA region at risk for trauma-related psychopathology, particularly PTSD (Charlson et al., 2019; Kazour et al., 2017). Moreover, the refugees have had high and persistent rates of PTSD for many years following their displacement (Blackmore et al., 2020). A study of Syrian refugees in Germany found that 13.9% had PTSD, with more severe symptoms associated with a shorter validity of the residence permit and a greater number of experienced traumatic events (Borho et al., 2020). Besides, according to a review study conducted in Arab countries affected by war and conflict, estimates of PTSD prevalence ranged between 35% and 50%, with causes markedly differing between countries (Baddoura & Merhi, 2015).

Lebanon, a small Mediterranean country, has borne continuous turmoil over the past decades. Its population has witnessed bombings, internal and external wars, social unrest, a nitrate explosion, and a recent debilitating economic deterioration. Since the start of the civil war in neighboring Syria on March 15, 2011, Syrian families have been subjected to a brutal conflict that has killed hundreds of thousands of people, torn the country apart, and set back its standard of living by decades. This has resulted in the world's largest refugee and displacement crisis, as well as massive destruction of infrastructure, healthcare systems, population social status, an economic crisis, and an increasing need for humanitarian assistance (Stone-Brown, 2013). As a result of the crisis, Syrian refugees have fled to neighboring countries, including Lebanon, Jordan, Turkey, Egypt, and Iraq (Berti, 2015). Lebanon currently hosts over 1.5 million Syrian refugees (Estriani, 2019). This massive influx has had a significant impact on Lebanon and added a severe strain to its healthcare system (Santoro & McKee, 2017). Despite all these events, studies about PTSD in Lebanon remain scarce.

This systematic review aimed to assess PTSD epidemiology in the Lebanese population and among Syrian refugees regardless of their location of residence. This review's findings would help delineate the breadth and depth of existing PTSD literature among the Lebanese population and Syrian refugees. It would also contribute to the development of benchmarks for examining the current PTSD quality of healthcare and would underline the need for strategic guidelines to enhance PTSD management in these populations.

Method

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. The protocol was registered in the PROSPERO International Prospective Register of Systematic Reviews (registration number CRD42021247714).

Search Strategy

We searched MEDLINE/OVID, Embase, and APA PsycINFO since inception. To conduct a thorough search of the databases, MeSH terms, keywords, and word combinations related to PTSD were used. Two of the MeSH terms included "Stress Disorders, Posttraumatic" or "Psychological Trauma," while some of the keywords included "Injury Moral," "Posttraumatic Psychosis," and "Historical Trauma," with the remaining terms provided in Supplemental Search Strategy. The search was limited to the English and French languages. The EndNote software (v. 20) was used to manage all the records returned from this search strategy.

Study Selection

Peer-reviewed qualitative, quantitative, and mixed methods articles identified through our original search and through scoping of systematic reviews that met the following inclusion criteria were included in this systematic review: (a) articles with Lebanese population or Syrian refugees with PTSD as working population, and (b) articles that screened for or diagnosed PTSD via valid instruments or clinical interviews based on the DSM criteria.

Narratives, commentary articles, abstracts, biographies, conference lectures, animal studies, magazines, encyclopedias, articles describing a theory or framework without primary data, and articles in which PTSD was not reported in the working population were all excluded.

All articles were independently assessed by three reviewers (JEH, YY, and HEH). During the primary title and abstract screening, articles describing or evaluating PTSD among the Lebanese population or the Syrian refugees according to the inclusion criteria were considered for full-text screening. The same three reviewers then assessed the full texts of the articles included after the preliminary screening, with a fourth reviewer (SHF) consulted to resolve discrepancies in screening.

Quality Assessment

One reviewer (JEH) assessed the risk of bias in all the articles that met the inclusion criteria, using the Downs and Black criteria for quality assessment (Downs & Black, 1998). The checklist contains 27 items that evaluate the quality of reporting, external validity, internal validity (bias and confounding), and power, with a maximal quality index (QI) of 32. The QI has been shown to correlate with previously established instruments for quality assessment in both randomized and nonrandomized studies (Aubut et al., 2013). The risk of bias associated with each article was recognized during the narrative synthesis and discussion of this review. No articles were excluded from the review or the narrative analysis based on their risk of bias.

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Data Extraction and Synthesis

Three reviewers (JEH, YY, and HEH) abstracted data from the studies that met the inclusion criteria. Abstracted data included the manuscript title, first author, year of publication, study design, time period, country of origin, site of the study, sample size, patient characteristics (age, gender, education level, economic status, employment status, marital status, social status, and living situation), living environment, type of traumatic event, PTSD severity, exposure to war, mechanism of injury if applicable, case/diagnosis ascertainment method, treatments, psychiatric comorbidity, clinical outcomes, and study funding. For Syrian refugees, data about place of residency, the number of years since displacement from Syria, accommodation type, and migration status were also collected.

A meta-analysis could not be meaningfully performed because of the insufficient data and the heterogeneity among the included studies. Consequently, the data were summarized qualitatively in tables and descriptive text.

Ethical Considerations

This systematic review has no more than minimal risk since data were not collected and IRB approval was not required to complete the work.

Results

A total of 10,367 articles were identified through the database searches. After duplicates were removed, 7,638 titles and abstracts were screened, of which 342 full-text articles were identified. Among these, 27 articles were book chapters/abstracts and were excluded from further review. Of the remaining full-text articles, 96 primary research articles were included in this review, and 10 reviews were screened, identifying six additional primary research articles for inclusion. This resulted in 102 articles included for data synthesis. None of the theses identified during the search met the inclusion criteria. Figure 1 presents the *PRISMA* flow diagram for a detailed account of the search and screening results.

Study Characteristics

Table 1 summarizes the characteristics of the 102 included studies. The search yielded articles primarily conducted in Turkey (40%) for Syrian refugees, and exclusively in Lebanon for the Lebanese population. The most common type of study was cross-sectional (74%). Two treatments/interventions were reported among the Lebanese population, and 10 among Syrian refugees. Many screening and diagnosis tools were mentioned in the included studies, with the Harvard Trauma Questionnaire (HTQ) being the most used ($n = 22$). In addition, for the first time, the International Trauma Questionnaire (ITQ) was used to assess its clinical utility and to study the prevalence rate of ICD-11 PTSD and complex post-traumatic stress disorder (CPTSD) among Syrian refugees in Lebanon, where findings revealed a slightly higher number of people met the diagnosis of CPTSD (prevalence rate 36.1%) compared to PTSD (prevalence rate 25.2%; Hyland et al., 2018; Vallieres et al., 2018).

Regional Distribution

Figures 1 and 2 in the online supplementary materials present the distribution of Syrian refugees and the Lebanese population included in the review, respectively. Syrian refugees were mostly residing in Turkey (45.8%), followed by Sweden (14.3%), Jordan (12.5%), Lebanon (9.7%), Iraq (5.2%), Canada (4.9%), Germany (3.4%), Norway (1.9%), United States (1.3%), Greece (0.7%), Nederland (0.3%), and Australia (0.2%). The spatial distribution of the Lebanese population was restricted to Lebanon, with the majority living in South Lebanon, followed by Beirut, Mount Lebanon, North Lebanon, and Beqaa.

Age Distribution

Figure 2 depicts the age distribution among the Lebanese population and Syrian refugees by number of participants in the included studies. The majority of studies focused on Lebanese children and adolescents, with a mean age ranging between 9 and 18 years. The mean age group for Syrian refugees ranged between 28 and 38 years.

Gender Distribution

Figure 3 illustrates the number of males and females among the Lebanese population and Syrian refugees in the included studies. There was no significant difference between males and females.

Traumatic Events

Table 2 depicts the traumatic events experienced by the Lebanese population in the included studies. War-related trauma from Israel's occupation of South Lebanon (2000 and 2006), Grapes of Wrath 1996, and civil wars (1975–1990 and 1991–1992) were the most common traumatic events.

Figure 4 captures the trauma-related events experienced or witnessed by the 14,214 Lebanese participants in the included studies. A combat situation was the most common type of trauma, followed by nonwar-related traumas, such as childhood adversities, the death or murder of a relative or others, and being a refugee.

Figure 5 captures the trauma-related events experienced or witnessed by the 12,346 Syrian refugees since the Syrian civil war ($n = 31$studies), whereas the other studies only mention the Syrian civil war in general ($n = 47$ studies). Torture, imprisonment, or kidnapping were the most common traumatic events, followed by the murder or death of a relative or close friend, and combat-related events.

Living Conditions for Syrian Refugees

Figure 3 in the online supplementary materials illustrates the place of residence after displacement, with a total of 18,986 participants from 35 articles that discussed the living conditions of Syrian refugees. The most common place of residence was a camp.

Prevalence of PTSD

For each of the Lebanese population and Syrian refugees, the average prevalence of PTSD was calculated by multiplying available percentage prevalence rates by the corresponding number of participants and then dividing the sum by the total number of participants.

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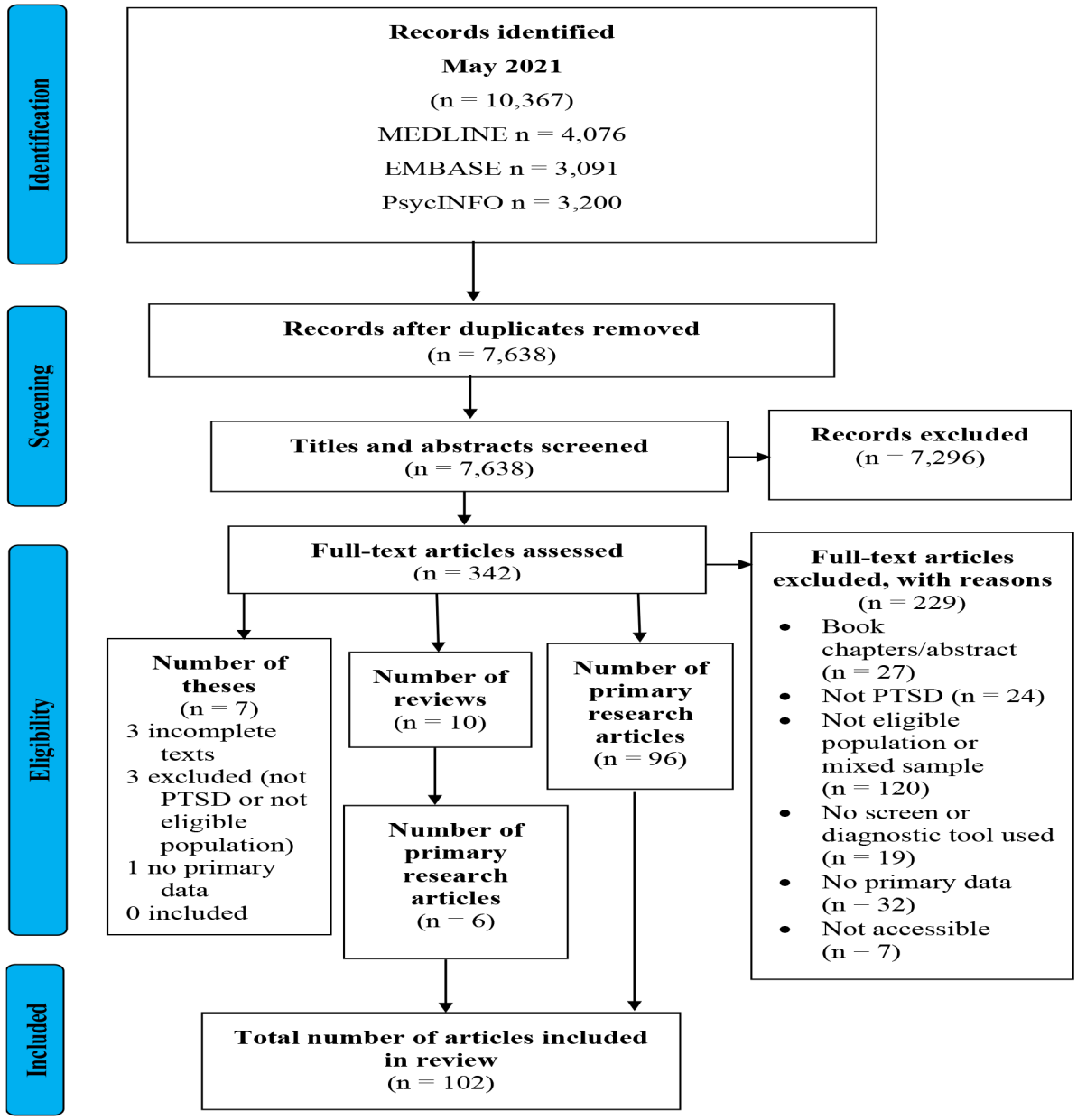
Figure 1

PRISMA Flow Chart, the Systematic Search Process



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Accordingly, the average prevalence of PTSD within the Lebanese population was 11.61% while the average prevalence of PTSD among Syrian refugees was 32.48%, approximately 3 times the rate within the Lebanese population.

Predictors of PTSD

Tables 3 and 4 summarize the risk and protective factors among the Lebanese and Syrian refugees, respectively. Being a female, of older age, and exposure to war were the main risk factors shared by the two populations.

Discussion

This systematic review represents a summary of PTSD epidemiology and characteristics among the Lebanese population and Syrian refugees. Lebanon and Syria have complex and intricate historical binds that cross social, economic, and political boundaries. Despite a long history of Syrian presence and migration in Lebanon, Syrian refugees began to arrive in increased numbers at the outbreak of the Syrian War in 2011, and the influx of Syrian refugees living in Lebanon began to rise, reaching over one million Syrian according to latest estimates.

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Table 1
Characteristics of the Included Studies

Study characteristics		*n*
Country of study		
For Lebanese population ($N = 24$)	Lebanon	24
For Syrian refugees ($N = 78$)	Turkey	31
	Germany	8
	Jordan	7
	Lebanon	7
	United States of America	6
	Sweden	5
	Iraq	3
	Greece	2
	Lebanon and Norway	2
	Turkey and Sweden	2
	Australia	1
	Canada	1
	Germany and Iraq	1
	Jordan and Lebanon	1
	Nederland	1
Study design		
Cross-sectional		75
Prospective study		5
Randomized controlled trial		5
Interventional study		5
Case—control		2
Case report		2
Register-based study		2
Based on the baseline sample of a randomized controlled trial		1
Brief report		1
Epidemiological survey		1
Nation study		1
Pilot study		1
Prospective experimental intervention with a pre/post-test design and without use of a control group		1
Treatment/intervention		
Eye movement desensitization and reprocessing (EMDR) therapy		4
Art therapy		2
Self-Help App "Sanadak"		2
Classroom-based psychosocial intervention		1
Dance/Movement therapy		1
Psychological support		1
School-based treatment		1
Screening or diagnosis tool for PTSD		
Harvard Trauma Questionnaire (HTQ)		22
PTSD Checklist (PCL) (Civilian Version PCL-C or PCL-5)		11
Children's Revised Impact of Event Scale (CRIES-8 or CRIES-13)		7
Impact of Event Scale-Revised (IES-R)[a]		8
Children's PTSD Inventory		3
Clinician-Administered PTSD Scale (CAPS)		5
Posttraumatic Diagnostic Scale (PDS-5)		4
UCLA PTSD Reaction Index (parent or children version)		5
Interview/Diagnostic criteria based on the DSM-IV or DSM-V		7
Essen Trauma Inventory (ETI)		3
Mini-International Neuropsychiatric Interview (MINI)		5
Primary Care-PTSD (PC-PTSD)		3
WHO Composite International Diagnostic Interview Version 3.0 (CIDI3.0)		3
Children Posttraumatic Stress—Reaction Index (CPTS-RI)		2
Diagnostic Interview for Children and Adolescents-Revised (DICA-R)		2
International Trauma Questionnaire (ITQ)		2
Short Posttraumatic Stress Disorder Inventory (PTSD-8)		2
Four-item Posttraumatic Stress Disorder Measure (PTSD-4),		1
Achenbach's Youth Self-Report (YSR)		1
Child Posttraumatic Stress Disorder Symptom Scale (CPSS)		1
Trauma Symptom Checklist for Children (TSC-C)		1
Civilian Mississippi PTSD scale		1
DSM-III Child Posttraumatic Stress Reaction Checklist (PTSRC)		1
Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS-PL)		1
Posttraumatic Symptom Scale (PTSS-10)		1
PTSD Reaction Index (PTSD-RI) for DSM-IV		1
PTSD scale in Arabic		1

[a]Two research articles reported two screening/diagnostic tools used during their study: MINI and IES-R.

The systematic review synthesized data from 102 articles, 24 conducted among the Lebanese population and 78 among Syrian refugees. Only two treatments/interventions were reported among the Lebanese population compared to 10 among Syrian refugees. Most studies concentrated on Lebanese children and adolescents aged from 9 to 18 years and on Syrian refugees aged from 28 to 38 years. There was no discernible difference in PTSD rates between males and females. The most common traumatic events experienced or witnessed by the Lebanese population were combat-related events, followed by nonwar-related traumas. As for Syrian refugees, torture, imprisonment, and kidnapping were the most common traumatic events. There were also numerous risk factors for PTSD, with the two populations sharing being a female, of older age, and exposure to war. Furthermore, the average prevalence of PTSD in the Lebanese population was 11.61%, while it was 32.48% among Syrian refugees, nearly 3 times the rate in the Lebanese population. Hence, the prevalence identified in the systematic review is similar to the 26.51% found by Hoppen et al. in global research (Hoppen et al., 2021).

One specific aspect of war-related traumas that is related to Lebanon, Syria, and the MENA region, in general, is blast injuries. Since blast injuries and their outcomes are not well characterized in the literature, El Sayed et al. studied blast injury characteristics in 59 blast victims admitted to a tertiary care center in Beirut, Lebanon over 8 years to identify potential admission predictors following a blast injury. They found that facial injuries were the most prevalent, with close associations between injuries of various organs,

Figure 2
Number of Participants as a Function of Mean Age Categories (Years)

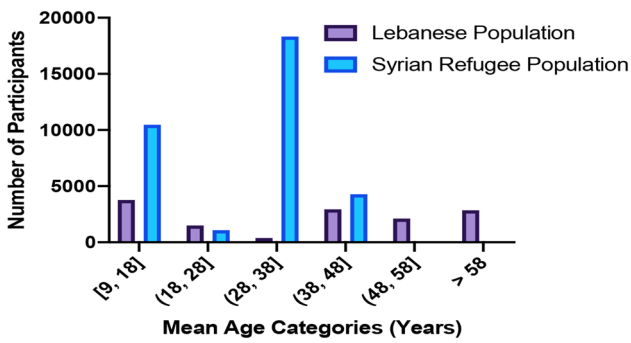

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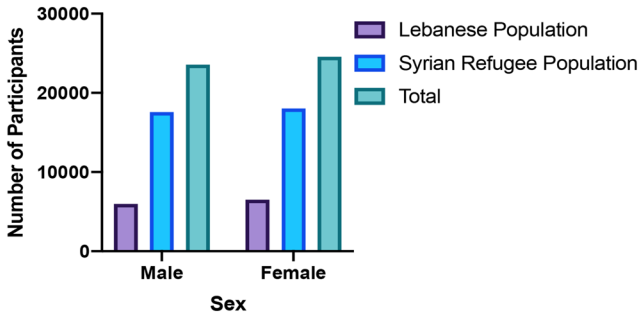
Figure 3

Number of Participants as a Function of Sex



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particularly the brain (El Sayed et al., 2015). Blast injuries have become of further interest following the August 2020 Beirut Ammonium Nitrate explosion, which occurred during the COVID-19 pandemic (Al-Hajj, Dhaini, et al., 2021). Interestingly, the 2020 Beirut explosion has initiated the first reported national and international response to a man-induced disaster during the pandemic (El Sayed, 2022). One of the main healthcare challenges after the explosion was the reduced capacity to cope with the rising COVID-19 cases, which increased dramatically following the blast (El Sayed, 2022). These compounded factors, thus, aggravated the physical and emotional toll of the explosion, resulting in a precarious human and medical situation. A study by Fawaz and Samaha (2020), focusing on the psychological impact of COVID-19 quarantines in Lebanon, found that quarantine itself resulted in PTSD symptoms during the second week of isolation, further worsened throughout the fourth week of quarantine. The most common and frequently reported symptoms included "feeling distant from other people," "feeling very upset when reminded of past stressful experiences," and having "repeated disturbing memories of a stressful experience from the past" (Fawaz & Samaha, 2020). As these various studies illustrate, the combined effects of the pandemic and resulting quarantine, coupled with the social impacts of the August 2020 blast, have worsened symptoms of PTSD among Lebanese civilians and residents of Beirut, emphasizing the necessity of implementing appropriate mental health interventions to alleviate PTSD symptoms in this population.

Table 2

Traumatic Events Experienced or Witnessed by the Lebanese Population

Traumatic events in Lebanon	Number of studies
Childhood adversities	3
Car bombing in Beirut	1
Church explosion	1
Civil war (1975–1990)	1
Grapes of Wrath (1996)	2
Intimate partner violence against women	1
Israeli occupation in South Lebanon (2000)	2
Israeli occupation in South Lebanon (July 2006)	4
Lebanese civil war (1991–1992)	1
Imprisonment and torture	1
Saw a close friend receive a near-fatal chest stray bullet	1
War-related traumatic events	5

One of the most intriguing findings is the link between PTSD and traumatic brain injury (TBI), as PTSD is common in civilian and military populations suffering from TBI (Mureșanu et al., 2022). When compared to North Africa and Europe, the Middle East has a disproportionately high prevalence of TBI (Al-Hajj, Hammoud, et al., 2021). Studies have also been conducted in Lebanon (Ghandour et al., 2022), which has been devastated by numerous war conflicts and violent acts. In a systematic review conducted among the Lebanese population to study the epidemiology and clinical characteristics of TBI, war and blast injuries were the most common cause, followed by domestic causes. It is worth noting that Syrian refugees make up the majority of non-Lebanese TBI patients (Abou-Abbass et al., 2016). It is critical to emphasize the link between TBI and psychological trauma, where TBI is the upstream instigator that leads to the occurrence of PTSD (Vasterling et al., 2018). In fact, previous research indicates that PTSD symptoms are widely prevalent in the Lebanese population. For instance, a study by Farhood et al. showed that 97.7% of a studied cohort of civilians from the South of Lebanon witnessed, experienced, or heard of a traumatic war-related event, resulting in a PTSD prevalence of 29.3% (L. Farhood et al., 2006). A more recent study by Yaacoub and colleagues evaluated depression and PTSD factors in 77 hospitalized adult Lebanese males who were directly or indirectly involved in a war or armed conflict (Yaacoub et al., 2020). Using the Hamilton Anxiety and Depression scales as well as the Mini-International Neuropsychiatric Interview, the authors demonstrated that participation in the war was linked to higher PTSD rates. Hence, people who were directly or indirectly involved in armed conflicts were more prone to developing mental health disorders, including PTSD. Another prospective longitudinal 10-year investigation assessed the short versus long-term prevalence of PTSD among 244 Lebanese civilians injured by cluster munitions (Fares et al., 2017). The study showed that, although PTSD prevalence decreased from 98% to 43% after 10 years, negative mood and cognition remained common in the long term, leading to job instability (Fares et al., 2017). Hence, psychological sequelae, such as trauma-related symptoms, and associated socioeconomic repercussions remain prevalent in war-affected civilian populations and require targeted short- and long-term interventions to help alleviate the impact of war. Besides, traumatic experiences in the Lebanese population are not limited to war-related events, where we discovered two other studies that highlight the traumas that the Lebanese population has experienced or witnessed, one focusing on war episodes among adolescents (Shaar, 2013), and the other on the various traumas experienced by adults, where the main traumas are war-trauma and intimate partner violence, as we revealed in the results (El Hajj, 2021). PTSD symptoms are highly prevalent (97%) among battered women subjected to intimate partner violence (Khadra et al., 2015). As these epidemiological studies indicate, PTSD symptoms are common among the Lebanese population and stem from a multitude of stressors, including war-related events, man-made disasters, natural occurrences, and interpersonal traumas. This uncovers the dire need for targeted healthcare policies that can help establish appropriate and culturally tailored screening methods for PTSD, improve prevention and treatment efforts, and subsequently alleviate the mental and psychological burden of PTSD in affected Lebanese individuals.

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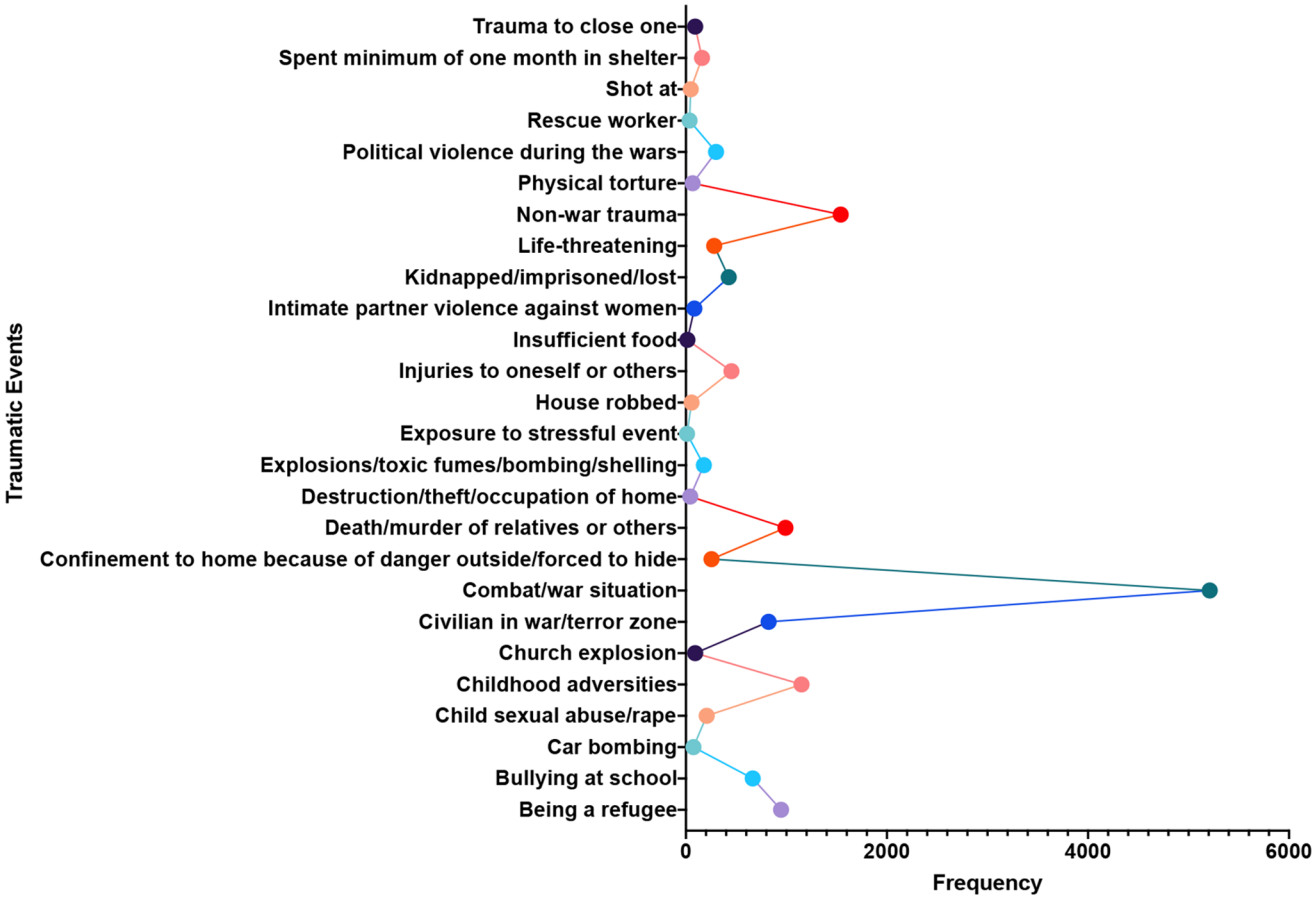
Figure 4

Traumatic Events Experienced by the Lebanese Population



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The prevalence of mental illness, including PTSD, is also high among refugee populations, particularly among Syrian refugees. According to the synthesized studies, the prevalence of PTSD in this population ranged from 2% to 84%. A cross-sectional study of Syrian refugees aged 18 and above who migrated and resettled in camps in the United States found the highest prevalence of 84%. Females with a history of psychiatric disorders, two or more traumatic events, and a family history of mental illness had the highest prevalence. In addition, 72% of refugees lacked basic necessities while 68% had a relative or friend killed during the war. Furthermore, only 20% sought treatment. All of these factors might have contributed to the high PTSD prevalence (M'Zah et al., 2019). Another study conducted in Turkey, with 608 participants living in a camp located near the border of Syria, found a similar prevalence of 83.4%. This was partially attributed to refugees being exposed to the sounds of bombs and airplanes from Syria, unlike other refugees who have resettled in a country far from the conflict zone (Acarturk et al., 2018). Alternatively, a prospective cohort study among Syrian refugees in Lebanon had the lowest PTSD prevalence, with 5% at baseline and 2% at follow-up in Norway after resettlement. Stromme et al. attribute this decline to reliance on resettlement and renewed optimism for the future (Stromme et al., 2020). Overall, however, prevalence rates of PTSD secondary to war, trauma, and forced displacement were found to be high. This also pinpoints the need for targeted interventions among this population.

Twelve studies evaluated the efficacy of treatment interventions for PTSD. Of these, two targeted the Lebanese population. Karam et al. used a school and classroom-based therapy that was administered by teachers throughout the academic year; the first consisted of a therapy assessment (TA) group, in which teachers were trained to minimize feelings of fear and its continuous interference with one's usual activities and tasks, as well as to normalize student's recovery processes (A. N. Karam et al., 1996); the second consisted of a combination of cognitive behavioral strategies and stress inoculation training (E. G. Karam et al., 2008); neither study showed that the intervention was effective. On the other hand, 10 interventional studies targeting Syrian refugees emanated from Turkey ($n = 6$), Germany ($n = 2$), and the United States ($n = 2$). All studies conducted in Turkey assessed eye movement desensitization and reprocessing (EMDR) therapy, which involves recalling the most traumatic experience while performing horizontal eye movements or tapping (Acarturk et al., 2015, 2016; Perilli et al., 2019; Yurtsever et al., 2018). According to Acarturk et al., improvements

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Figure 5

Traumatic Events Experienced by the Syrian Refugee Population

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in PTSD symptoms were maintained after an 11-week follow-up (Acarturk et al., 2015). Furthermore, dance/movement therapy (Grasser et al., 2019), which was given to a group of children who had been resettled in the United States, and art therapy, which allows clients to express their emotions and thoughts in their own unique way, were found to be other effective methods for reducing PTSD symptoms (Feen-Calligan et al., 2020; Ugurlu et al., 2016). Gormez and colleagues showed that eight sessions of psychosocial assistance based on cognitive behavioral therapy reduced intrusive symptoms of PTSD and psychological distress among 10–15-year-old refugees in Turkey (Gormez et al., 2017). Two studies assessing Self-Help App were conducted in Germany, but the results were not promising as the intervention, although cost-effective, was not more clinically effective than the control condition in reducing mild-to-moderate posttraumatic stress (Röhr et al., 2020, 2021). More studies are needed to establish the most efficacious treatment interventions among refugee populations, where pharmacotherapy and psychotherapy should be considered, where a meta-analysis was conducted to study the first-line treatment for PTSD, with the findings emphasizing the importance of trauma-focused psychotherapy over medication, while long-term benefits required medication (Lee et al., 2016). Treatment should encompass pharmacological and nonpharmacological avenues and should be based on a multidisciplinary team of mental health professionals such as psychiatrists, psychologists, counselors, primary care doctors, nurses, social workers, and case managers. This would allow the implementation of holistic, multidisciplinary, and culturally tailored interventions, which would optimize treatment outcomes.

This study has several limitations. Some studies of interest might have been missed, as non-English and non-French manuscripts were excluded. Therefore, PTSD studies among Syrian refugees in Turkey or European countries where English or French is not the primary language might have been missed. In addition, the Arabic literature was not reviewed, nor gray literature, or institutions or health systems that publish nonpeer-reviewed reports limiting the comprehensiveness of this review. Furthermore, while we limited our research to three databases, OVID Medline, EMBASE, and PsychINFO, we included a large number of search terms in our search strategy to ensure that we captured all of the articles in these databases without missing any. However, the primary search strategy was not only extensive but also supplemented with a secondary search of included reviews to capture any missed articles.

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Table 3
Predictors of PTSD Among the Lebanese Population

Article references	Risk factors	*OR* and *p*
Shaar (2013)	Age group younger than 13 years	$OR = 11.25$, $p < .05$
L. Farhood et al. (2018) and L. F. Farhood and Dimassi (2012)	Cigarette smoking	$OR = 2.79$, $p = .004$ (among males) $OR = 2.69$, $p < .001$
Yaacoub et al. (2020)	Depression	$OR = 1.08$, $p = .024$
L. Farhood et al. (2018)	Domestic violence	$OR = 2.01$, $p = .040$ (among females) $OR = 2.85$, $p = .031$ (among males)
Khamis (2018)	Emotion-focused coping among females	$OR = 1.04$, $p < .010$
Ghaddar et al. (2016)	Exposure to beating	$OR = 1.\ 49$, $p = .040$
E. G. Karam et al. (2008)	Family quarrels	$OR = 4.50$, $p < .050$
L. F. Farhood and Dimassi (2012) and L. F. Farhood and Noureddine (2003)	Female gender	$OR = 6.88$, $p < .001$ $OR = 4.54$, $p \leq .050$
L. F. Farhood and Noureddine (2003)	Financial problems	$OR = 4.76$, $p \leq .050$
L. Farhood et al. (2018)	Increased number of adverse life events	$OR = 1.40$, $p = .025$ (among females) $OR = 1.55$, $p = .040$ (among males)
Khamis (2018)	Learning disabilities	$OR = 3.00$; $p < .004$ (among females) $OR = 2.45$; $p < .010$ (among males)
Ghaddar et al. (2016)	Longer imprisonment periods	$OR = 2.35$, $p \leq .001$
Yaacoub et al. (2019)	Participation in war	$OR = 6.35$, $p = .047$
E. G. Karam et al. (2008)	Prewar separation anxiety disorder	$OR = 7.40$, $p < .050$
E. G. Karam et al. (2008)	Prewar PTSD	$OR = 8.20$, $p < .050$
L. Farhood et al. (2018)	Physical health problems	$OR = 2.38$, $p < .001$
L. F. Farhood and Noureddine (2003)	Severity of injury	$OR = 4.34$, $p \leq .050$
Ghaddar et al. (2016)	Threatening by rape	$OR = 1.43$, $p = .050$
L. Farhood et al. (2018)	Tranquilizer use among males	$OR = 2.81$, $p = .021$
L. F. Farhood and Dimassi (2012)	War exposure	$OR = 1.56$, $p < .001$
L. Farhood et al. (2018)	Witnessed traumatic events	$OR = 1.25$, $p < .001$ (among females) $OR = 1.28$, $p < .001$ (among males)
Article references	**Protective factors**	***OR* and *p***
Ghaddar et al. (2016)	Devoutness	$OR = 0.24$, $p = .030$
Yaacoub et al. (2019)	Young age	$OR = 0.94$, $p = .055$
Khamis (2018)	Positive family environment	$OR = 0.92$, $p < .040$ (among females) $OR = 0.90$, $p < .020$ (among males)
Yaacoub et al. (2019)	Substance use	$OR = 0.19$, $p = .061$
L. Farhood et al. (2018) and L. F. Farhood and Dimassi (2012)	Social support	$OR = 0.72$, $p < .001$ $OR = 0.73$, $p < .001$

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Table 4
Predictors of PTSD Among the Syrian Refugees

Article references	Risk factors	*OR* and *p*
Georgiadou et al. (2018), E. G. Karam et al. (2019), Sagaltici et al. (2020) and Scherer et al. (2020)	Age (18–61 years), as well as older children (14–17 years)	$\beta = 0.24$, $p = .001$ $\beta = 0.83$, $p < .007$ $\beta = 0.10$, $p < .050$ $OR = 3.00$, $p < .050$
Beni Yonis et al. (2020)	Adolescents who had one or both parents died	$OR = 1.70$, $p = .006$
E. G. Karam et al. (2019)	Childhood adversities	$\beta = 1.02$, $p < .000$
Acarturk et al. (2021) and Kaya et al. (2019)	Chronic illness or disability	$OR = 1.84$, $p < .050$ $OR = 2.05$, $p < .001$
Acarturk et al. (2018)	Experiencing a life threat to self	$OR = 3.00$, $p < .001$
Acarturk et al. (2021) and Alpak et al. (2015)	Experiencing traumatic event	$OR = 2.68$, $p < .001$ $OR = 2.88$, $p < .001$
Gottvall et al. (2019)	Exposure to torture	$OR = 2.52$, $p < .001$
Alpak et al. (2015)	Family history of psychiatric disorder	$OR = 2.78$, $p = .049$
Acarturk et al. (2018, 2021), Alpak et al. (2015), Beni Yonis et al. (2020), Borho et al. (2020), Kaya et al. (2019), Mahmood et al. (2019), Sagaltici et al. (2020) and Scherer et al. (2020)	Female gender	$OR = 4.10$, $p < .00$ $OR = 1.86$, $p < .001$ $OR = 4.00$, $p < .001$ $OR = 1.50$, $p = .001$ $\beta = -0.25$, $p = .017$ $OR = 2.80$, $p < .001$ $\beta = 0.17$, $p < .001$ $\beta = 0.41$, $p < .001$ $OR = 1.60$, $p < .050$
Hyland et al. (2018)	Functional impairment	$OR = 1.38$, $p < .050$
Georgiadou et al. (2018)	Greater symptoms of generalized anxiety	$\beta = 0.46$, $p = .000$
Mahmood et al. (2019)	Growing up in urban areas	$\beta = 0.10$, $p < .010$
Uygun (2021)	Living in the war-stricken area	$\beta = 0.28$, $p < .050$
Cengiz et al. (2019)	Low monthly income	$OR = 1.21$, $p < .050$
Ghaddar et al. (2016)	Male gender	$OR = 0.71$, $p = .040$
Mahmood et al. (2019)	More extended stay in camp	$\beta = 0.16$, $p < .001$
Borho et al. (2020), Georgiadou et al. (2018), Kaya et al. (2019), Khamis (2019), Mahmood et al. (2019), Sagaltici et al. (2020) and Uygun (2021)	Number of traumatic events	$\beta = 0.48$, $p < .001$ $\beta = 0.35$, $p = .000$ $OR = 1.09$, $p < .001$ $OR = 1.24$, $p < .000$ $\beta = 0.33$, $p < .001$ $\beta = 0.19$, $p < .001$ $\beta = 0.76$, $p < .001$
Acarturk et al. (2021)	Not enough emotional support from others	$OR = 2.20$, $p < .001$
Acarturk et al. (2021)	Not feeling safe and protected (himself/herself or their family)	$OR = 2.07$, $p < .010$
Acarturk et al. (2018), Alpak et al. (2015), Kaya et al. (2019)	Previous mental/psychiatric problem	$OR = 4.50$, $p < .025$ $OR = 6.27$, $p = .031$ $OR = 5.48$, $p < 0.050$
Acarturk et al. (2021)	Problems in the community with law and justice	$OR = 2.07$, $p < .001$
E. G. Karam et al. (2019)	Sensitivity	$\beta = 0.17$, $p < .0001$
Borho et al. (2020) and Georgiadou et al. (2018)	Shorter validity of the residence permission	$\beta = -0.18$, $p = .020$ $\beta = -0.20$, $p = .041$
Ghaddar et al. (2016)	Death of someone important	$OR = 1.50$, $p = .320$
Kazour et al. (2017)	Syrian hometown	$OR = 2.14$, $p = .013$
E. G. Karam et al. (2019)	War exposure	$\beta = 0.67$, $p < .000$
Cengiz et al. (2019)	Wish to return to the home country	$OR = 1.17$, $p < .05$
Article references	**Protective factors**	***OR* and *p***
Scherer et al. (2020)	Children living in a household with more than eight members	$OR = 0.50$, $p < .050$
Khamis (2019)	Family expressiveness	$OR = 0.82$, $p < .000$
Khamis (2019)	Higher length of time spent in the host country since displacement	$OR = 0.98$, $p < .000$
Gottvall et al. (2019) and Khamis (2019)	Higher social support	$OR = 0.57$, $p < .001$ $OR = 0.59$, $p < .007$
Al-Smadi et al. (2016)	Having a job	$OR = 7.68$, $p = .005$
Khamis (2019)	Host country	$OR = 3.31$, $p < .000$
Acarturk et al. (2021)	Good household economic situation	$OR = 0.19$, $p < .001$
Beni Yonis et al. (2020)	Location of residence (Sahab city in Jordan)	$OR = 0.60$, $p = .006$
Al-Smadi et al. (2016)	Medication availability	$OR = 2.04$, $p = .005$

Similarly, the title and abstract screening were purposely broad to include articles on mental health, stress, violence, war, and tortures, recognizing that many abstracts may only describe data or refer to mental health or psychological distress without specifying PTSD. Including these articles in the full-text screening reduced the risk of missing relevant articles. Moreover, one of our studies mentioned the use of medication for only three Syrian refugees who fled to Lebanon out of 123 Syrians with PTSD (Kazour et al., 2017). It is critical to emphasize the importance of medication in the treatment of PTSD. As we can use psychopharmacological treatments, where pharmacologic agents that are efficacious for the treatment of PTSD are selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitor (SNRI) classes, although clinical efficacy appears to be modest at best (Akiki & Abdallah, 2018), but there are many limitations for taking medications, particularly in Arab countries and for refugees. The first limitation is the budget and cost of the medications, where there is a limitation in financial resources and inability to afford medications, the lack of access to medications, the individualized treatment that should take care of the patients' priorities first, and side effects of the medications that necessitate access to higher level health facilities.

In conclusion, PTSD rates are high among the Lebanese population and Syrian refugees. This is secondary to the exposure to a constellation of traumatic events, mostly related to war, trauma, and conflict. This systematic review puts into perspective the importance of conducting more clinical research in the field of trauma-related disorders in the MENA region. Further understanding the epidemiology of PTSD in this area, its characteristics, risk, and protective factors, and comorbidities can provide insights into effective treatment avenues and help guide physicians, policymakers, and the multidisciplinary team of mental health professionals, alike, in optimizing care in the field.

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