

## Reviews and Meta-analysis

# Post-traumatic stress disorder in adolescents in Lebanon as wars gained in ferocity: a systematic review

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### Significance for public health

Post traumatic stress disorder (PTSD) in adolescents has been implicated in developmental impairments, mental and scholastic problems, alcohol and drug abuse, and antisocial behavior in its victims among others. Absence of review studies regarding the prevalence of PTSD in adolescents in Lebanon, a country plagued by decades of civil strife and external occupation and invasion, is noted. Such information may reinforce the need to develop national public health policies to identify PTSD in children and adolescents, provide them with counseling and treatment, and formulate prevention strategies to protect vulnerable youth from devastations of war.

## Abstract

For decades, Lebanon was war-torn by civil strife, and occupation and invasion by neighboring countries. In time, these wars have escalated in intensity from sniping, barricading streets and random shelling of residential quarters to the use of rockets, aerial bombing, and heavy artillery. Adverse mental health effects are noted in times of war with post traumatic stress disorder (PTSD) as a main outcome. The aim of this study was to carry out a systematic review of published studies documenting the prevalence of PTSD in the adolescent population of Lebanon, to investigate the increase in these rates with the escalation of war intensity, and to examine PTSD determinants. A search strategy was developed for online databases (PubMed and Google Scholar) between inception to the first week of January 2013. Search terms used were PTSD, adolescents and Lebanon. Eleven studies reporting PTSD in adolescents met the inclusion criteria for a total number of 5965 adolescents. Prevalence rates of PTSD ranged from 8.5% to 14.7% for the civil war, 3.7% for adolescents with sensory disabilities, 21.6% for the Grapes of Wrath War, and 15.4% to 35.0% for the 2006 July War. Some increase in PTSD rates in time is noted. Type of trauma such as bereavement, injury, house destruction, and economic problems, low self efficacy and scholastic impairment were related to PTSD. These findings may help in the development of public health policies for PTSD prevention and treatment for the protection of adolescents from war atrocities and their consequences.

## Introduction

Lebanon, a small country on the East Mediterranean Basin, has been plagued by decades of internal conflict and external invasions and occupation (1975-2006). The internal conflict lasted for fifteen years (1975-1990) and was characterized by random shelling, barricaded streets, kidnapping and torturing, and massive displacement waves.

During that period, South Lebanon was invaded by a neighboring country in 1978 and again in 1982. The 1982 invasion reached the capital Beirut. Aerial bombing and heavy artillery resulted in massive destruction and a high toll of injuries and deaths. Further, during the period of civil war, other local battles around Lebanese towns and refugee camps were also fought such as the battle of Zahle, the War of the Camps, the Mountain War etc. These resulted in more destruction, casualties, fatalities, and displacement waves. By the end of the civil war, the decimated country was occupied by another neighboring country. An increase in war ferocity was noted in The Grapes of Wrath War in 1996 and in the July 2006 war. The former was an invasion of South Lebanon and was characterized by extensive aerial bombing and heavy artillery shelling that lasted for 16 days. The July 2006 war which lasted for 34 days covered the capital, South Lebanon and other parts of the country. Whole villages and residential blocks were destroyed in addition to power plants, and other infrastructures. This war also resulted in the displacement of approximately one million Lebanese individuals.

Calamities of war have long been related to mental health problems particularly among children and adolescents, with PTSD as one main outcome consequent to war trauma.<sup>1</sup> Adolescents are a vulnerable group in face of war adversities mainly because adolescence is a transitional period from childhood to adulthood. This development is both biological and psychosocial. Adolescents are trying to become independent and self-determining, develop their own definition of self and who they want to be. Trauma and the ensuing PTSD may delay their developmental processes by causing regression to dependency on parents and others.<sup>2</sup> They may find solace and refuge in alcohol, substance abuse, and/or through antisocial behaviour among other behaviors.<sup>3</sup> In fact, Kessler notes that *Prospective studies confirm this temporal order although significant predictive associations are reciprocal.*<sup>4</sup> Learning and academic problems are also noted in traumatized adolescent subjects who perform worse on intelligence scales and academic achievement tests as compared to the less traumatized controls.<sup>3</sup>

Three recent review articles of mental health in areas of armed conflict in the Middle East are noted.<sup>5-7</sup> One review did not include Lebanon<sup>6</sup> and the second review included two studies of adult groups in Lebanon.<sup>7</sup> The third review covered four Lebanese studies (two about children, one about adults, and one about adolescents that did not provide prevalence rates of PTSD).<sup>5</sup> In view of the increase in the ferocities of war in Lebanon from 1975 to 2006, and in the absence of review information about PTSD in adolescents in the country, the purpose of this systematic review was to review PTSD prevalence rates and their determinants in adolescents in Lebanon in different times of war, and examine any increase in PTSD rates with the increase in war violence in the country.

## Search strategy and inclusion criteria

Pub Med and Google Scholar data bases were searched separately for peer-reviewed articles, reports and book chapters about primary data on PTSD in adolescents in Lebanon from inception to the 9<sup>th</sup> of January 2013. Inclusion criteria for this review were primary studies of PTSD in adolescents conducted in Lebanon. PTSD assessment in studies was included if it was done by valid and reliable instruments or by clinical interviews based on DSM criteria (DSM III, DSM IIIR, DSM IV).<sup>8-10</sup> Adolescence for this study was defined in accordance with the UNICEF criterion, *i.e.*, the period between 10 and 19 years.<sup>11</sup> Search terms were PTSD, adolescents, and Lebanon. The search identified 1495 English language studies. After eliminating duplicate listings (n=22), an initial screening of 1473 titles and abstracts was conducted, and a further 1430 listings were excluded as they were reviews or studies of other countries. Full text articles, reports, and book chapters for 43 relevant abstracts were retrieved and 32 studies with no investigation of PTSD or studies of other age groups such as children and adults were excluded. Eleven studies met the study inclusion criteria (Figure 1).

## Data abstraction

Information was retrieved from the reviewed articles and reports on demographic variables (age and sex), sample size, study setting, geographical region covered, the scales that were used, the anchoring criteria for PTSD (DSM versions), time elapsed between data collection and war episode, and PTSD prevalence rates. Further relevant explanatory variables where available were also abstracted. These variables included father's occupation and mother's education, financial difficulty, type of traumatic event, disability, self efficacy, scholastic impairment, and religiosity and ideology.

## Results

This review was based on information from 11 eligible studies (Table 1).<sup>12-22</sup> The earliest study was published in 1988 and the most recent

was published in 2013. All the included studies measured PTSD as a primary outcome. PTSD diagnosis was based on DSM III criteria (4 studies),<sup>13-16</sup> DSM IIIR criteria (6 studies),<sup>12,17-21</sup> and DSM IV criteria (1 study).<sup>22</sup> The civil war (1975-1990) was covered by six studies,<sup>12-17</sup> the Grapes of Wrath War (1996) was covered by one study,<sup>18</sup> and the July 2006 war was covered by four studies.<sup>19-22</sup> Time elapsed between the war experience and data collection ranged between three weeks to four years (Table 1). Risk of PTSD was based on the Post-Traumatic Stress Disorder Reaction Checklist for Children (PTSRC),<sup>23</sup> (two studies),<sup>12,17</sup> Children's PTSD Inventory,<sup>24</sup> (four studies),<sup>13-16</sup> Children's Revised Impact of Event Scale (CRIES),<sup>25</sup> (one study),<sup>19</sup> Diagnostic Interview for Children and Adolescents-Revised (DICA-R),<sup>26</sup> (two studies),<sup>18,20</sup> Davidson PTS Scale,<sup>27</sup> (one study),<sup>21</sup> and clinical interview (one study),<sup>22</sup> (Table 1). Study designs were mainly cross-sectional surveys (8 studies).<sup>12,15-19,21-22</sup> Two studies were conducted to validate an instrument,<sup>13-14</sup> and one study had a cross-sectional component and an intervention component.<sup>20</sup> Participants were selected from schools (9 studies),<sup>12,15-22</sup> or were subjects with psychological or academic difficulties referred by physicians, mental health practitioners, or educators for evaluation (2 studies).<sup>13-14</sup> The schools were either private schools (2 studies),<sup>15,16</sup> public schools (2 studies),<sup>20,22</sup> or both public and private schools (5 studies).<sup>17-19,21</sup> One study included adolescents with sensory disabilities as the primary group.<sup>17</sup> Geographical regions covered were the capital Beirut (5 studies),<sup>12-16</sup> South Lebanon (2 studies),<sup>20,22</sup> and several regions in Lebanon (4 studies).<sup>17-19,21</sup> Sample sizes varied from 85 to 3109 for a total of 5965 adolescents (Table 1).

## Post traumatic stress disorder prevalence rates

The prevalence rate was not specifically reported in one study (Table 1).<sup>12</sup> Prevalence rates for PTSD ranged from 8.5% to 35.0% for adolescents in schools, and 29.3% to 32.5% for adolescent referrals who had psychological or academic problems. Prevalence rates for adolescents with sensory disabilities were 3.7% as compared to 11.7% in their able-bodied peers (Figure 2). Figure 2 is a forest plot that displays PTSD

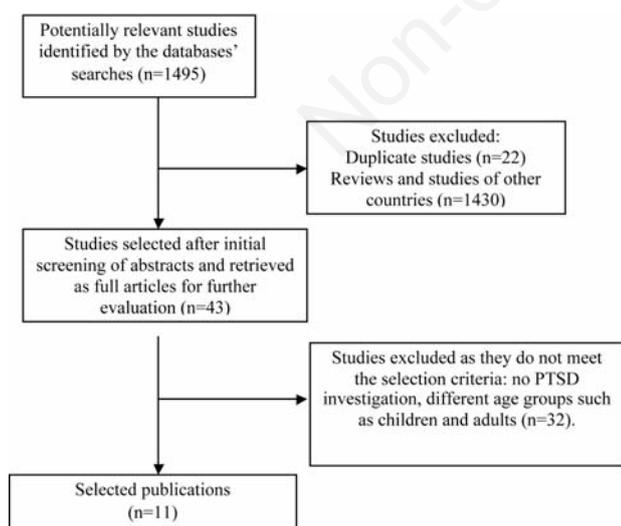


Figure 1. Systematic literature review process. The flow diagram describes the systematic review of literature on post traumatic stress disorder in adolescents in Lebanon. Eleven studies were selected.

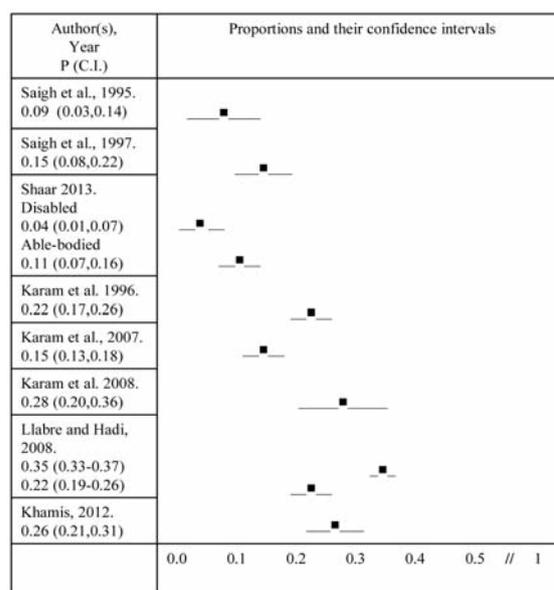


Figure 2. Post traumatic stress disorder proportions and their confidence intervals plot.

Table 1. Prevalence of post traumatic stress disorder in adolescents in Lebanon.

Study	Study design	Setting	Anchoring criteria, scale used	Sample size	Age (years)	Elapsed time since conflict	PTSD prevalence (95% C.I.)
<b>The Civil War 1975-1990</b>							
Macksoud <i>et al.</i> <sup>12</sup>	Cross-sectional	Public and private schools, Beirut	DSM III R, Child Post-Traumatic Stress Disorder Reaction Checklist for Children (PTSRC)	224	10-16	1 year	Not reported
Saigh <i>et al.</i> <sup>13</sup>	Scale validation	Referrals for evaluation, Beirut	DSM III, Children's PTSD Inventory	92	13	Not stated	29.3% (20.0-38.6)
Saigh <i>et al.</i> <sup>14</sup>	Scale validation	Referrals for evaluation, Beirut	DSM III, Children's PTSD Inventory	840	9-12	1-2 years	32.5% (29.3-35.7)
Saigh <i>et al.</i> <sup>15</sup>	Cross-sectional	Private schools, Beirut	DSM III, Children's PTSD Inventory	85	13	1.8 years	8.5 % (2.6-14.4)
Saigh <i>et al.</i> <sup>16</sup>	Cross-sectional	Private schools, Beirut	DSM III, Children's PTSD Inventory	95	Mean 17.5	Mean 4.2 years	14.7 % (7.6-21.8)
Shaar <sup>17</sup>	Cross-sectional	Private and public schools, Beirut, Mount Lebanon, and city of Sidon	DSM III R, Child Post-Traumatic Stress Reaction Checklist (PTSRC)	332 sub-sample: 163 disabled, 163 able-bodied	10-20 10-19	2 years	Disabled: 3.7% (0.8-6.6) Able-bodied: 11.7% (6.8-16.6)
<b>The Grapes of Wrath 1996 War</b>							
Karam <i>et al.</i> <sup>18</sup>	Cross-sectional	Private and public schools in South Lebanon and West Beka'a	DSM III R, Diagnostic Interview for Children and Adolescents (DICA-R)	402, sub-sample: 283	6-17 10-17	3 weeks	21.6% (16.8-26.4)
<b>The July 2006 War</b>							
Karam <i>et al.</i> <sup>19</sup>	Cross-sectional	Private and public schools in Southern Suburb of Beirut and South Lebanon	DSM III R, Children's Revised Impact of Event Scale (CRIES)	Sub-sample of 709	12-18	8 months	15.4% (12.7-18.1)
Karam <i>et al.</i> <sup>20</sup>	Cross-sectional and intervention	Public Schools in South Lebanon	DSM III R, Diagnostic Interview for Children and Adolescents-Revised (DICA-R)	116 treatment, 93 controls	Treatment mean: 11.7 Control mean: 11.8	1 month	At baseline: Treatment group, 27.7% (19.6-35.8); Control, 31.2% (21.8-40.6) After 1 year: Treatment group, 1.0% (0-2.8); controls, 2.2% (0-5.2)
Llabre & Hadi <sup>21</sup>	Cross-sectional	Private and public schools in Lebanon	DSM III R, Davidson Post Traumatic Stress Symptoms Scale (PTS)	Sub-sample of 3019	Grades 6-12* Mean 14.6	9 months	High bombing & damage zone: 35.0% (32.5-37.5) Lower bombing and damage zone: 22.4 % (19.0-25.8) Areas not subject to any direct hits: 23.9 % (21.3-26.5)
Khamis <sup>22</sup>	Cross-sectional	Public schools, South Lebanon	DSM IV, Clinical interview	300	12-16	4 years	25.7% (20.8-30.6)

\*Corresponds to ages 11-18 years. Post-Traumatic Stress Disorder Reaction Checklist for Children (PTSRC) (23), Children's PTSD Inventory (24), Children's Revised Impact of Event Scale (CRIES) (25), Diagnostic Interview for Children and Adolescents-Revised (DICA-R) (26), Davidson Post Traumatic Stress Symptoms Scale (PTS) (27).

prevalence rates and their confidence intervals in the reviewed seven cross-sectional studies and in the cross-sectional and intervention study. Comparison of prevalence rates by war period showed some increase in time. These rates ranged from 8.5% to 14.7% for the civil war (excluding studies of referrals), 3.7 % for adolescents with disabilities and 11.7% for their able-bodied peers, 21.6% for the Grapes of Wrath War, and 15.4% to 35.0% for the 2006 July War.

## Explanatory variables

The explanatory variables that were investigated besides age and sex were father's occupation (3 studies),<sup>12,17,22</sup> mother's education (2 studies),<sup>12,22</sup> financial difficulty (2 studies),<sup>20,22</sup> type of traumatic event (7 studies),<sup>12,17,18-22</sup> disability (one study),<sup>17</sup> self efficacy (one study),<sup>15</sup> scholastic impairment (one study),<sup>16</sup> and ideology and religiosity (one study).<sup>22</sup>

## Discussion

The purpose of this study was to review PTSD prevalence rates and their determinants in adolescents in Lebanon in times of civil strife and war episodes, and to examine these rates in the context of the escalation in war ferocities in the country. There are several strengths and limitation to this study. Strengths relate to the fact that this is the first systematic review of PTSD prevalence in adolescents in Lebanon, and to the extensive search for studies that was conducted. Limitations include the cross-sectional design of most studies that precludes the understanding of the temporal sequence of relationships between explanatory variables and PTSD.

Four main findings were noted in this review. The first main finding was the relatively small number of studies of PTSD in adolescents during the civil war period that lasted for fifteen years (1975-1990) despite an abundance of other studies of mental health of children and adolescents that were conducted.<sup>29-35</sup> This may be explained by the fact that diagnostic criteria for posttraumatic stress disorder were first introduced in 1980 in the Third Diagnostic and Statistical Manual (DSM III) of the American Psychological Association.<sup>8</sup> The disorder was not related to children and adolescents until the publication of the DSM III R in 1987.<sup>36</sup> As such, early work was focused on scale development. In this review, two of the civil war studies were conducted for the validation of a PTSD scale for use with children and adolescents based on these criteria.<sup>13,14</sup> This scale, the Children's PTSD Inventory, was later used in two other studies of PTSD: PTSD and self efficacy and PTSD and scholastic impairment.<sup>15,16</sup> Further, two other studies of civil war used a PTSD scale devised by one of the authors.<sup>12,17</sup> After 1990, the country enjoyed a period of peace and prosperity that was interrupted by the invasion of South Lebanon that lasted for sixteen days, namely, The Grapes of Wrath War, 1996. Only one study of adolescents for that war is noted.<sup>18</sup> However, the PTSD effect of the massive attack of 34 days of Lebanon in July of 2006 on adolescents was investigated by four studies.<sup>19-22</sup> This paucity of studies may also be attributed to the low resources in a country at war and to the hazards of conducting studies in times of active combat.

The second main finding was the differences in prevalence rates of PTSD in adolescents both for similar time periods and across time. For the civil war period, higher rates were noted among adolescents that were referred for investigation for mental and scholastic problems (29.3-32.5%) as compared to rates for adolescents sampled from schools (8.5-14.7%). This is expected as the two studies of the referred

adolescents were designed for scale validation purposes, and these referrals included a higher proportion of PTSD cases. As such, these referrals were a select and not a random group of the population of adolescents. Findings also showed that PTSD prevalence rates ranged from 21.6% for the Grapes of Wrath War, 1996, and 15.4% to 35.0% for the July War of 2006 (Table 1 and Figure 2). Some of these differences may be attributed to the adoption of different scales that were based on different DSM diagnostic criteria for PTSD, an expected finding given the long time span of this review. The different time elapsed between exposure to war violence and data collection, and the exposure to different types of war events and the intensity of such exposures is another factor. A fourth factor may be related to the possible differences in survivorship rates among adolescents in different wars. Prevalence rates include survivors only. There is reason to believe that survival rates of adolescents became lower with the escalation in war violence. This is particularly true of inhabitants of small towns and villages who were not prepared for such violence by way of early warning sirens for air raids and by having underground shelters for cover. Consequently, an underestimation of PTSD rates might have ensued. Nonetheless, some increase in PTSD rates with the increase in war ferocity is noted (Figure 2). This increase may be explained by the fact that the civil war was a chronic war between local warring factions and included random shelling, sniping, kidnapping and torture. People could avoid routes controlled by snipers and barricaded streets, and could hide from random shelling when it occurred. Later invasions of the country were characterized by air raids, heavy artillery fire, destruction of whole villages and neighbourhoods, power plants and bridges. Exposure to air raids and heavy artillery fire was overwhelming in that it was unpredictable and people could not escape its destructive effects.

The third main finding showed that PTSD rates in this review were elevated when compared to rates among adolescents in peaceful countries such as the neighbouring Oman (0.5%) or the U.S. (8.0%).<sup>37,38</sup> They were, however, similar to the PTSD rates of conflict zones in neighbouring countries that were reported in studies conducted in home or school settings: 32.3% in homes,<sup>39</sup> and 25.0-36.0% in schools.<sup>40-43</sup> It is in the context of harsh settings that PTSD rates in neighbouring countries reached staggering heights (32.7-68.9%) in schools of refugee camps,<sup>44,45</sup> 20.0-59.0% in refugee camps,<sup>46,47</sup> 87.0% in displacement camps,<sup>48</sup> and 70.0% in homes in a study conducted during shelling.<sup>49</sup> Living hardships that were endured in refugee and displacement camps made adolescents more vulnerable to war ordeals as a start, and it also made their mental health problems harder to heal from after exposure to trauma.

## Explanatory factors

These constitute the fourth main finding of this review. Older age was significantly related to PTSD in adolescents with sensory disabilities in one study.<sup>17</sup> Reasons offered were the longer exposure to war violence. Sex was not explanatory of PTSD in any of the reviewed studies. This is contrary to the current contention that sex differences do exist. Tolin and Foa (2008) in their review of 25 years of research on sex differences (children, adolescents and adults) in trauma exposure and posttraumatic stress disorder noted that in combat, war or terrorism, females in civilian populations showed a greater likelihood of PTSD as compared to males.<sup>50</sup> Their results held even after controlling for type of traumatic event. The authors attributed sex differences to preexisting cognitive and affective reactions to trauma and a tendency toward different expressions of distress for males versus females.

Socio-economic status as measured by father's occupation in three studies was not significantly related to PTSD.<sup>12,17,21</sup> However, economic hardship was a risk factor for PTSD in one study.<sup>20</sup> Socio-economic status is a broad measure of the resources available to the family. It is plausible that when the living conditions are extremely harsh, they

become a risk factor for adverse mental health outcomes. On the other hand, the cross-sectional design of these studies may also denote that individuals living in extreme hardship may become more vulnerable to adverse mental outcomes.

Another risk factor was type and severity of trauma exposure. The most devastating traumas in most of the reviewed studies were loss and bereavement, injury to self or others, seeing their house demolished or hit, and displacement. The devastating effect of witnessing death, experiencing injury to self and others and losing their home at this young age were explanatory of these findings where the direct experiencing of trauma is the more powerful exposure as compared to witnessing violence from a distance.<sup>12</sup> Along a similar vein, researchers note that direct intense threats to one's safety, or the safety of his/her loved ones (subjective experience of trauma) are more devastating than the more distant objective experience (witnessing trauma) both in children and in adults.<sup>51-53</sup>

Adolescents with PTSD also showed higher scholastic impairment in one study.<sup>16</sup> The cross sectional nature of this study does not provide a clue about the temporal sequence of the relationship of scholastic impairment to PTSD. However, findings from studies on consequences of PTSD in adolescent groups point to their learning and academic problems, lower performance on intelligence scales and academic achievement tests as compared to the less traumatized controls.<sup>3</sup>

Findings also showed that adolescents with visual and hearing impairments had lower PTSD rates as compared to their able-bodied peers in view of their lower exposure rates to severe trauma.<sup>17</sup> Handicap, defined as the psychosocial consequence of disability,<sup>54</sup> permeates the lives of afflicted people, and it is commensurate with disability type, and characteristics of the disabled subjects.<sup>55,56</sup> For Lebanon, with the exclusion of war-injured individuals,<sup>57</sup> the disabled groups are young and come from the more disadvantaged sectors of society where future expectations for them were not so high and rigid.<sup>56,58</sup> Anecdotal evidence from data collection from our study of the group with sensorial disabilities showed that this was a somewhat select group that attended special schools. Their bonding was with others who had similar disabilities and with their teachers who are there for them.<sup>17</sup> In another study of a representative sample of physically disabled people in the western sector of the capital and its southern suburb, the study subjects were young adults who were hopeful, cheerful, and lived and bonded with their families of origin and with other members of associations that represent them.<sup>58</sup> Findings also showed that families of this group raised the socioeconomic level of their offspring (as noted in their occupational levels), contrary to contentions related to the drift hypothesis.<sup>59</sup> This may explain in part their good mental well-being.<sup>17,58</sup>

Adolescents with PTSD showed lower self efficacy levels.<sup>15</sup> The role of self efficacy in eliciting support and in being in control is well-documented in the literature.<sup>60</sup> On the other hand ideology did not play a role in attenuating the effects of PTSD.<sup>22</sup> This however was contrary to findings in the Gaza Strip, where ideology provided a framework for the comprehension of the political conflict and its ramifications.<sup>22</sup> Likewise, religiosity was not significantly related to PTSD despite the role of primary social organizers that religious sects play in Lebanon.<sup>22</sup>

## Conclusions and recommendations

A systematic review of PTSD in adolescents in Lebanon during various wars (1975-2006) was conducted, and PTSD rates showed some increase in time. Higher rates of PTSD were noted in adolescents in the most recent wars and adolescents who were exposed to the 2006 invasion suffered most. Some of the differences in these rates may be

related to artifactual factors such as the different DSM anchoring criteria, the different scales that were used, and the different time spans between exposure and data collection. Other real differences are due to the more intense war trauma exposures and the specific characteristics of the investigated groups. These rates were also higher than rates in peaceful neighbouring countries, but did not reach the staggeringly high rates in the neighbouring Palestinian territories and Iraq that were noted in harsh settings such as refugee and displacement camps. Further, in this review, several factors such as type of trauma, economic problems, and low self-efficacy were noted as explanatory factors for PTSD inception and in varying degrees of intensity. Further research is needed in other areas related to PTSD such as resilience, coping mechanisms, parental mental health and family support mechanisms. Findings of this review warrant serious attention to the burden of PTSD in adolescents in Lebanon and calls for meaningful efforts to enhance the ability of the protective family environment and other support groups. Provision of counselling and treatment services at the school and community levels to ameliorate the deleterious consequences of war in these vulnerable groups are also called for.

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