Posttraumatic stress disorder (PTSD), anger and Mental health of school students in Syria after ten years of conflict: a large scale school-based study

Ameer Kakaje (✉ ameer.kakaje@hotmail.com)

Damascus University, faculty of medicine <https://orcid.org/0000-0002-3949-6109>

Ragheed Al Zohbi

Aleppo University, faculty of medicine

Ayham Alyousbashi

Damascus University, faculty of medicine

Rawan N. K. Abdelwahed

Damascus University, faculty of medicine

Osama Hosam Aldeen

Damascus University, faculty of medicine

Mohammad Marwan Alhalabi

Damascus University, faculty of medicine

Ayham Ghareeb

Damascus University, faculty of medicine

Youssef Latifeh

(3) Department of Internal Medicine, Division of Psychiatry, Al-Mowasat University Hospital, Damascus Syria

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Abstract

The Syrian crisis has entered its tenth year with incessant conflicts in many locations across Syria. Much of the population have been impacted including children who suffer the direct and indirect war effects of war. To date there has been no large scale study examining the mental health and academic impacts of the war of children in Syria. This large-scale cross-sectional study aims to evaluate the psychological profile of school students in Damascus Syria examining PTSD, anger and general mental health and examine their relationships with work, smoking and academic performance. The study included 1369 students from seven different schools. Surveys included assessment of mental and physical well-being using a measure of health related quality of life (SF8), Posttraumatic stress disorder (CRIES-13), problematic anger (DAR5) smoking, working habits, social support and academic grades. The study found that more than half of the children suffered from PTSD (53%), problematic anger (62%) with this being associated with poorer SF-8 (quality of life) scores in both mental and physical domains and more time watching TV and Internet. Around 46% declared fair or worse general health and 61% having moderate or severe mental health. War variables had an impact on PTSD, anger, and SF-8, but not an impact on grades. Worse HRQL was associated with war variables and smoking. Social support was negatively correlated with SF-8, PTSD, DAR-5 anger and declarations of close friends being the main source of support. This is the largest study of children in Syria to date that reports on the psychological ramification of war. The study demonstrates the severe impact on children across both mental health and physical health. Although direct war effect could not be observed, the high burden of PTSD and anger distress is a strong reflection of the chronic mental trauma. School students have had to work and face many hurdles in a young age which has left them severely impacted.

Introduction

The Syrian crisis remains complex and dynamic after it entered its tenth year. Syrians have suffered major tragedies affecting all aspects of their lives. It is estimated that 11.1 million people need humanitarian assistance in Syria and the north-west region is still under conflict with over than 950,000 being displaced and 2.7 million dependent on humanitarian assistance. More than 5.5 million have fled the country as refugees and 6 million were internally displaced. Approximately, eight out of ten people in Syria live below poverty line [1, 2]. Depleted savings, loss of income, displacement to seek safety, deprivation of education, starvation, and limited health service have all been fundamental threats potentially impacting the wellbeing of the Syrian population.

People involved in life-threatening events or exposed to the risk of physical injury to self or others can suffer from a serious psychological trauma and experience post-traumatic stress disorder (PTSD) [3]. Higher prevalence of PTSD was found in people who encountered a traumatic event and/or were exposed to the war in Syria [4]. PTSD symptoms lead to considerable impairment and severely disrupt social, occupational, and educational performance and functioning. Additionally further psychiatric disturbances may result as complications of PTSD such as mood and anxiety disorders, and dependence on addictive substances [5], with war exposure variables in Syria identified as correlated with cigarette and shisha smoking [6]. Furthermore, PTSD sufferers may develop somatoform complications manifesting as chronic pain, health deterioration, greater vulnerability to medical problems, and increased numbers of medical disorders [5] such as major non-malignant gastric-tract disorder [7]. Moreover, war-related distress was found to correlate with allergic rhinitis [8] and laryngopharyngeal reflux [9].

Children depend on adults who love them to provide them with empathy, care, and attention. Conflicts frequently disrupt attachments in various ways such as the loss of parents, parents' extreme concentration on protecting and providing the essential needs for the family, and lack of parents' emotional support due to depression or distraction [10]. Children may be forced into substitute care with less attentive or caring relatives or an orphanage. Alternatively children may become deprived of all adult protection as "unaccompanied children" [10]. Children who are required to move into refugee or displacement camps may suffer for years from catastrophic circumstances while waiting to resume their normal life [10]. Given this we can define conflicts as a major global public health threat [10].

While there has been some attention to rates of PTSD in Syria [4], few studies have been concerned with the status of children [11-13]. These studies found that higher social support was correlated with a lower probability of having PTSD [4, 14]. However these existing studies suffer from considerable limitations. The Syrian adult population samples were limited to the people who were online and saw the survey [4]; the one school study was mostly focused on oral health and while included a measure of PTSD not include any other mental health components and [12] or other school study involved the city of Damascus and Latakia which were much less affected than other cities from war and contained many less displaced people with the studied population in Damascus being limited to 247 participants from 5 schools with 67.9% not responding to war-related questions. Furthermore, they included age group of (8-15) years with students in elementary schools comprising the largest proportion while not mentioning schools locations.

The importance of intervention in reducing the psychological impact of distressing events has been long recognized [15], therefore it is crucial to detect mental reactions early in children and youth to put into place appropriate preventive strategies that target the social and psychological factors which have been demonstrated to predict long term mental health disorders [16]. High rates of socioeconomic deprivation impose a substantial need for mental health care for suffering populations, but only provide scarce accessibility for them [17]. Furthermore, the stigma associated with mental disorders limits the use of available resources [17]. Studies have indicated that further systematic data collection are required to address the needs of the internally displaced populations in order to enhance their physical and mental health through upgrading health system services [18]. It is fundamental to evaluate the efficacy of healthcare programs and interventions while great constraints are imposed on health care such as declined aid budgets, decreased access to health care services, and less affordable drugs are present to treat diseases of those living in conflict zones [19].

In this study, PTSD, anger, and health-related quality of life (HRQL) were evaluated among children in grade 10 or higher in Damascus in schools. In addition factors including smoking, socioeconomic status, working, war variables, TV and internet time were also assessed. The study aims to determine the behaviours and the psychological profile of children who spent ten years of their life at war and how it affected their mental health and their daily lives. This

study was conducted directly before the lock down of the county on 13/03/2020 and before any confirmed cases of COVID-19 in Syria which indicates a minimum effect if the virus on the general population. Our study is the first to measure war zone related health-related quality of life, anger and examine the effects that PTSD and other mental health factors have on educational gains..

Methods

1) Sampling:

Our study is a cross-sectional study conducted in Syria from 1/3/2020 to 12/3/2020. Surveys in Arabic were distributed in Damascus public schools which were divided into four areas: East, West, North, and South. No surveys were distributed in public schools in the Eastern region due to the unexpected lock down. Only participants who lived in Syria and attended its schools for the past ten years were enrolled. Schools were randomly chosen from each area while balancing gender distribution as most public schools are unisex. Only student in grade ten or higher were enrolled regardless of age. Students were also randomly chosen from classes. Surveys were distributed in school classes to avoid the interference of other family members while answering with at least two skilled data collectors remained in classes to assure anonymity and to explain if something was not clear for the student.

2) Consent and approval for study:

Written consent was given from the caregivers before proceeding with the survey by one week when children were younger than 18 years, and for using and publishing the data. Written consent was also taken when the participant was 18 years or older. Confidentiality was assured and no identity-revealing questions were asked. Oral consent was also taken from children before giving the survey regardless of age.

Our study protocol and ethical aspect were reviewed and approved by Damascus University, faculty of medicine ethic committee in Damascus, Syria. It was also approved by Damascus University vice president for scientific affair, Damascus University faculty of medicine vice dean for scientific affairs, and by minister of education.

3) Questionnaires:

- **Socioeconomic status (SES):**

SES was assessed through three criteria; (1) the education level and profession of the participant or the working family members, (2) the monthly family income of the participant if they were living alone, or of the house provider if living in family. SES was then divided into four different categories: lower, upper lower, middle, and upper.

- **Health-related quality of life (HRQL):**

An Arabic version of the self-reported HRQL SF-8 was used to evaluate the general health, the physical functioning, physical role, body pain, the vitality, social functioning, mental-health, and emotional-role [20, 21]. SF 8 is a short measure for large population and is used to assess the general physical and mental health. It can be used in a population which was affected by a conflict. We used a version with five point responses as the first item answers of "fair" and "good" were combined into fair and the fourth item answers of "mild" and "moderate" were combined into "moderate" [21]. Items (1-4) measured the physical component summary (PCS), and items (5-8) measured the mental component summary (MCS).

- **Social support:**

An Arabic version of Multidimensional Scale of Perceived Social Support (MSPSS) [22, 23] was used to measure the support that the individual receives from their social network including friends, family, and significant other [22, 23]. Only one presentative question was used as the survey was meant to be short. The questions, that were in Arabic, were: "I get the emotional help & support I need from my family", "I have a special person who is a real source of comfort to me", and "I have friends with whom I can share my joys and sorrows". Only scores were used for comparisons.

- **PTSD:**

An Arabic version of children's impact of event scale (13) CRIES-13 was used, which is a self-reporting screening method for PTSD that can be used in children aged eight years and older [24, 25]. It contains four items to measure intrusion, four items to measure avoidance, and five items to measure arousal. For PTSD screening, the results of intrusion and avoidance are used, and therefore their score without arousal is determined for PTSD screening. If the sum of the two scales is 17 or more, there is a high probability of the child having PTSD. The score of arousal was only used in this study as a score without setting a cut-off. CRIES-13, however, is based on diagnostic and statistical manual of mental disorders IV (DSM IV) [21, 26]. These three clusters, intrusion, arousal, and avoidance, are close to what is used in the International Classification of Disease 11 (ICD-11) criteria. However, using DSM IV criteria relatively diagnoses less severe traumatic cases [27].

Each item had four answers with four point scale; not at all=0, rarely=1, sometimes=3, and often=5.

- **Anger:**

Dimensions of anger reactions 5 (DAR-5) was used to assess the frequency, intensity, duration of anger in the last four weeks. It is also used to assess the aggression and the impact that the anger had on social functioning. It is a self-reported measure that contains 5 items and has a scale ranging (1-5). When

the sum of these five items is above 12, it is an indication that the person has anger-related physiological distress and functional impairment [28, 29]. However, there is no Arabic version of DAR-5 and therefore we translated it and used it in the survey.

- **Other Questions:**

Gender, province of origin, age and having consanguineous parents were some of the questions asked. Direct and indirect variables about war were identified, such as changing residency, being distressed or endangered, and losing someone close. Having a long standing medical condition was also collected. Third-degree consanguinity was defined as first cousins. Fourth-degree consanguinity was defined as second cousins, and second cousins once removed.

We asked questions about working; its reasons, time, type, years of working, if they liked their work, if they believed that their work significantly affected their study, and if they think that their boss was mean to them. We asked how many people are currently living in your house, and if the house was rented. We asked about the ninth grade marks as it is a national exam with unified questions across the country which could give a more accurate estimation if the marks differed between students.

We asked about smoking habits, whether they regularly and daily smoked cigarettes, shisha, or other, average number of cigarettes per day for the last month, and average number of shisha smoked per week. We asked about the reason for smoking and if they felt peer pressured into smoking, if they felt like adults when smoking, and the preferred time of shisha smoking. We asked about average time spent in hours each week on TV, or internet.

4) Data Process:

Data was processed using IBM SPSS software version 26 for Windows (SPSS Inc, IL, USA). Chi-square, one-way analysis of variance (ANOVA), and independent-t tests were performed to determine statistical significance between the groups. Pearson correlation was also calculated. Through the same software, odds ratios (ORs) and the 95% confidence intervals for the groups were calculated using Mantel–Haenszel test. Values of less than 0.05 for the two-tailed P values were considered statistically significant.

Results

- **General characteristics:**

In this study, 1369 students agreed to participate from seven different schools, two of which were in the northern area, two in the western area, and three in the southern area. It included 723 males and 646 females, of which 244 males and 349 females were from the northern area, 142 males and 205 females from the western area, and 337 males and 92 females from the southern area with a mean age of (16.38 ± 0.79) years. Major characteristics of these children with PTSD, and anger prevalence, HRQL 8 individual questions and PCS, and MCS scores are in **(Table 1)**. Of note here is that the prevalence of PTSD was 53% and problematic anger 62.2%. According to SF8, 46% have moderately to severely affected general health, 30.9% have somewhat limited physical functioning or worse, 30.9% have somewhat or more difficult to work from physical role, 35.3% have moderate to severe bodily pain, 29.4% have some energy or less, 29.1% have limited social functioning, 61% have moderate to severe negative mental health, and 32.5% have negative role-emotional. PTSD and anger prevalence according to gender and school districts are demonstrated in **(Figure 1)**.

- **Health-related quality of life (HRQL):**

Each individual question: All SF-8 results items were correlated with female gender with body pain, vitality, social functioning, mental-health, and emotional-role ($P < 0.001$), and general health ($P = 0.002$), physical role ($P = 0.014$), and physical functioning ($P > 0.05$). Poorer individual SF-8 question results were also correlated with having a chronic medical condition with ($P < 0.05$). Interestingly, better mental health score was correlated with consanguineous parents ($P = 0.011$) while other SF-8 questions had ($P > 0.05$) with consanguineous parents. All SF-8 results were correlated with having work at ($P < 0.001$) except for social functioning ($P = 0.018$), body pain ($P = 0.052$), physical finding ($P = 0.388$). None of the reported reasons for working were statistical significance with SF-8 results ($P > 0.05$). Declaring that the employer was mean and education being affected from work were correlated with poorer SF-8 results ($P < 0.01$) and ($P < 0.001$), respectively. There was no correlation between the house being rented and SF-8 results ($P > 0.05$).

Poorer SF-8 outcomes were all statistically significantly correlated with high probability of PTSD, higher arousal score, higher DAR-5 anger scores, and weaker family support at ($P < 0.001$). SF-8 single questions had correlations with all social support and DAR-5 ($r < \pm 0.3$), and for PTSD ($r > 0.3$) except for physical functioning all with ($P < 0.001$). All these results are demonstrated in **(Table 2)** in more details.

Poorer SF-8 results were found in responders with chronic medical condition ($P < 0.01$ for all SF-8 results). This was particularly in responders with cardiac or urinary medical condition. When comparing having a chronic medical condition or not with SF-8 results, all the results we significantly correlated with having a chronic medical condition ($P < 0.001$).

Frequency of weekly smoking shisha and number of close people lost from war were statistically significant correlated ($P < 0.05$) with worse physical role ($r = -0.132$, and $r = -0.153$, respectively) and worse vitality ($r = -0.131$, and $r = -0.153$, respectively). Other SF-8 results had correlations ($r < \pm 0.1$) with number of people living in the house, number of years failed in schools, SES scores, working years, number of cigarettes and shisha smoked, number of residences changed due to war and number of close individuals lost from war.

Cigarette and shisha smoking and being a previous smoker were correlated with all SF-8 results ($P < 0.001$) except for vitality ($P = 0.086$). Being distressed from war and being endangered from war were correlated with poorer SF-8 results with ($P < 0.01$) (except for physical functioning and its relation to being

distressed from war which had ($P=0.019$).

Physical and Mental Components (PCS and MCS): In examining the combination of the items into the PCS and MCS subscales, we observed that both scales were highly correlated ($r=0.526$ at $P<0.001$). Different characteristics of PCS and MCS scores in students are demonstrated in **(Table 4)**. Being distressed from war and endangered from war were significantly correlated with higher PCS and MCS scores ($P<0.001$). Changing place of living was also correlated with higher PCS ($P=0.006$), and MCS ($P=0.012$) scores. Having two or more positive of the previous three war variables had the mean PCS score of 15.17 ± 3.193 and the mean MCS score of 14.12 ± 3.478 . Being endangered from war had the highest mean PCS and MCS scores. PCS and MCS scores significant differences in regards to PTSD, anger, arousal, social support are demonstrated in **(Table 2)**.

Conducting forward linear regression on PCS scores was significant with these ($P<0.05$) with DAR 5 anger, having a chronic medical condition, losing someone due to war, family support, being distressed from war noises, working, and gender all contributing significantly with R square values indicating these variables contributed 7.7%, 2.6%, 1.3%, and 0.5%. 0.5%, 0.5%, and 0.5%, respectively to the PCS variance with DAR-5 anger scores recording ($P<0.001$). When doing forward linear regression on PCS scores with PTSD scores and the previous variables, ($P<0.05$) for PTSD scores, having a chronic medical condition, losing someone due to war, working, and family support with R square of 8.2%, 2.7%, 1.2%, 1.0%, and 0.4%, respectively with PTSD scores having ($P<0.001$).

Conducting forward linear regression on MCS scores with DAR 5 scores, DAR 5 anger, gender, family support, being endangered from war, working, having a chronic medical condition, being distressed from war noise, significant other support and friends support all contributed significantly ($P<0.05$) with R square values indicating these variables contributed 13.2%, 2.3%, 2.3%, 1.3%, 1.1%, 0.5%, 0.4%, 0.3% and 0.3% to the MCS variance respectively with the DAR 5 score recording ($P<0.001$). When using regression on MCS scores with the PTSD (intrusion + avoidance) score and the other previous variables, ($P<0.05$) for PTSD scores, family support, having a chronic medical condition, being endangered from war, gender, and working with R square of 19.5%, 2.0%, 0.8%, 0.5%, 0.5%, and 1.2%, respectively with PTSD scores having ($P<0.001$).

- **PTSD:**

PTSD prevalence was 53% with arousal mean score of 9.46. Correlations between PTSD and SF-8 was discussed in the previous paragraph, and demonstrated in **(Table 2)**. Correlations between CRIES-13 and DAR-5 are demonstrated in **(Table 3)**. PTSD (intrusion + avoidance) and arousal scores correlations with other variables are demonstrated in **(Table 4)** and **(Table 5)**. Other variables and PTSD were demonstrated in **(Table 5)**.

Forward linear regression on PTSD scores was significant ($P<0.001$) with DAR 5 anger score, gender, family support, being endangered from war, distressed from war noises, and changing place of living due to war recording R squares indicating contributions of 8.2%, 6.1%, 1.0%, 0.9%, 0.8%, and 0.3% to the variance in PTSD scores respectively. When using forward linear regression on PTSD scores with the same previous variables except for social support, R square value was 8.5% for DAR 5.

- **Anger:**

Problematic anger was seen in 62.2%. DAR 5 correlation with SF-8 and PTSD were demonstrated in previous paragraphs. More distress from anger was correlated with family support ($r=-0.161$) and friends support ($r=-0.098$) **(Table 3)**. Other variables were demonstrated in **(Table 4)**. Dar-5 scores were also correlated with more hours spent on TV and the Internet **(Table 5)**.

- **Other variables:**

Gender and consanguinity: Having parents of fourth degree consanguinity and more distant relatives were correlated with more numbers of people living in the house ($P<0.001$). However, consanguinity was not correlated with higher family support or any social support. Female gender had higher SES groups than males ($P<0.001$) while there was no difference in the house being rented or not between gender ($P>0.05$). Moreover, males worked for more years, and failed more years at school than females ($P<0.001$ for both). However, males watch TV for less hours while spending more hours on Internet ($P=0.007$, and $P=0.298$, respectively). Males smoke cigarette, and cigarette with shisha more than females ($P<0.001$) with males smoking more cigarettes (mean for females was 8.9 while for males was 13, $P=0.041$). More females (616 out of 642) did not have a work than males (245 out of 719) ($P<0.001$). Males failed more years than females [$(P<0.001)$ with mean for males (0.07) years and for females (0.03)]. Females expressed more distress from war noises than males [$P<0.001$ (OR, 4.632; 95% CI, 3.629-5.912)], but there was no difference in being endangered from war between genders ($P>0.05$).

School performance: Ninth grade marks were correlated with PTSD (intrusion + avoidance) score ($r=0.074$ and $P=0.009$), with family support ($r=0.076$ and $P=0.008$) while not significantly correlated with arousal score, DAR-5 anger scores, and other social supports ($P>0.05$). Living in a rented house, losing someone due to war, or being endangered from war had no statistical significant difference in marks ($P>0.05$). Interestingly, students being distressed from war had a significantly higher mean of ninth grade mark by 7 (2.6%) points ($P=0.002$). and females reported higher mean grades than males by 18 (5.8%) points ($P<0.001$). Having work was correlated with having lower grades (over than 15 points $P<0.001$). We also found a statistical significant difference when comparing type of work and grades ($P<0.001$) which is demonstrated in **(Figure 2)**. Smoking cigarette and/or shisha was correlated with lower grades by a mean of 6 (1.94%) points in shisha and 11 (3.5%) points in cigarette ($P<0.002$). There was a difference in mean grades of different SES groups as the high SES groups had higher marks ($P<0.001$) and the difference between the mean grade of the lower SES and Upper SES was around 25 points (8.1%). Forward linear Regressing DAR 5 scores, family, friends, and significant other support scores, PTSD scores, gender, working, and all war variables of distress from noises, being endangered, and changing place of living on grades was significant but ($P<0.001$) only gender and working contributed significantly to the variance in grades recording R squares of 5.9%, and 1.6%, respectively.

Socioeconomic status (SES): In our sample, there was no statistical significant difference in gender and living in a rented house, but there was in SES groups as females were in higher SES groups than males ($P < 0.001$). Moreover, in higher SES groups, students tended not to work more frequently ($P < 0.001$). Working was also correlated with cigarette and/or shisha smoking ($P < 0.001$). Lower SES was found with smoking but ($P = 0.061$). However, living in rented house was correlated with smoking, mainly cigarettes and cigarette with shisha ($P = 0.019$). More students from Southern area schools lived in rented houses ($P = 0.005$) and from Northern area were in higher SES groups ($P < 0.001$).

Other variables: The mean number of people that the students can depend on to provide them with support was 1.02 ± 0.427 . Around 17% declared that at least one parent was the main source of the support, 11.5% a sibling, 15% someone they loved, and 39.9% a close friend.

Discussion

Critically this study found that the prevalence of PTSD (intrusion + avoidance) was as high as 53.0% and 62% for problematic anger, with elevated mean of arousal scores (9.46). Moreover, one third of students were either previous smokers or current smokers. Around half of students had to change place of living due to war, 58% reported that they were directly endangered from the war, 61% had distress from war noises, and 40% had lost someone close due to war. Around one third had to work, mainly in summer times and holidays (including week-ends). It is clear therefore from this study which is the largest of its kind in Syria to assess for PTSD, anger, mental and physical health more generally that this is a highly impacted population.

- **PTSD:**

War trauma experience which manifests as losing someone or being endangered was correlated with higher PTSD prevalence [30]. PTSD when left untreated can become chronic and thus affecting the psychosocial development and functioning in adulthood. Therefore, actions are needed to be taken as a very large population of children in Syria was affected in this ten-year war [31]. Although this study did not involve the high-risk population, more than half of the children were screened positive for PTSD which will have devastating outcomes in the future.

PTSD prevalence in our study was over than half of children with female predominance which was somewhat less than another study conducted on Syrian population adults which used DSM-IV questionnaire similar to our study [4]. Another study in Damascus schools which included 811 children found that the prevalence can be up to 90% with variable degrees and this study also used a DSM-IV bases questionnaire [12]. Another study which used CRIES-8, similarly to our study, included 492 children aging between 8 and 15 years from schools in Damascus and Latakia with 35.1% having PTSD, 32% having depression, and 29.5% having anxiety [11]. It also found a female predominance similar to our study which is well known [32]. A study on Syrian schoolchildren refugees in Jordan found that 31% had moderate to severe PTSD with female predominance [33]. Another study in Lebanon and Jordan children refugees found that 45.6% have developed PTSD [34]. These differences in prevalence in studies in Syria and outside Syria may reflect that the internal displacement and persistent trauma had a more sever effect than being a refugee in a foreign country [4].

Moreover, as more than half of Syrian screened positive for PTSD in a previous study which did not involve high-risk population too [4], this will provide an extra risk as they may have symptoms when raising their child for years. Even when parents exhibit symptoms of PTSD acutely, this can contribute to developing persistent PTSD in children [35]. PTSD can also go for years without being recognised by the parents and PTSD in children is largely shaped by the parents' own acute traumatic stress which was a response to the child's trauma [35].

As more than half of this study had at least one positive war variable and even higher prevalence of war variables were found in many studies of the Syrian population and that this exposure had many ramifications to different health aspects [4, 6, 8, 9, 11, 12].

- **Anger:**

Anger can affect recovery and is associated with significant distress and impact on functioning [28, 29]. Some responders who would not admit they have been psychologically and emotionally affected from trauma will express these emotions in anger which is the reason why screening for anger might be as important and indeed more sensitive as screening for PTSD. Anger association with SF-8 and CRIES 13 was discussed in previous paragraphs. Anger in children can also be a part of oppositional defiant disorder and conduct disorder [30].

Anger was associated with smoking which may indicate that having distress from anger may predispose to smoking. This anger was not statistically significantly correlated with gender, SES, having chronic medical conditions, working, or with type of work. It was with multiple variables of war. Anger was also associated with more hours spent on TV and Internet.

DAR 5 is a useful tool for differentiating people with PTSD who would score high or low in State Trait Anger Expression Inventory-2 (STAXI 2) and in PCL for posttraumatic stress scores [28]. STAXI is the golden standard for anger but it is long to be used and DAR-5 is now used in many countries such as the UK, the US and Australia and recently translated into and tested in French [36]. Dar 15 was used to assess problematic anger and it showed higher level of PTSD, psychological distress and lower levels of quality of life [37].

Anger has been addressed as an important factor in PTSD as anger is one of the criteria for arousal symptom cluster of PTSD and other studies found that anger is important to determine PTSD severity. It was also noted that 40% of PTSD score variance is attributed to anger. However, its impact exceeds being attributed to one PTSD criterion [38]. Anger was significant in a particular PTSD population such as crime victims and survivors of torture [38-40].

Anger was found to be associated with lower mental and physical component in SF-12. Higher prevalence of personality disorders, substance abuse, and any psychiatric disorder [41]. Inappropriate anger prevalence in the US was found to be around 7.8%. with a male predominance [41] which was different from our study as no significant difference was found with gender.

- **Health-related quality of life (HRQL):**

All HRQL of SF-8 were negatively affected by PTSD, arousal, and anger. Female gender and having chronic medical conditions also negatively affected SF-8 while consanguineous parents had positive effects. This could not be explained by having larger families or more support as when they were compared with SF-8, they had no significant correlation. Moreover, less distress from anger was reported when having consanguineous parents which also could not be explained. Smoking was also correlated with poor HRQL, but we could not determine causation.

When using forward linear regression, MCS has affected PTSD score by 19.7%, and DAR 5 score by 13.7%. PCS had affected DAR 5 score by 9.4% and PTSD score by 8.5%.

SF 8 can be used for measurements of general physical and mental health in conflicts and internally displaced population [21, 42]. It was found to be a good measurement in programs for HRQL [43] and hence it was used in this study to provide baseline data for current programs and future studies. In the study of conflict and internally displaced population of 1206 adults, SF-8 was found to have a correlation with PTSD and depression [42]. They used a DSM-III based questionnaire which could explain the differences to our study which found a correlation in only social functioning, mental health, and emotional role while the others had a correlation. Furthermore, the population in that study had been in war for 20 years with older age groups and the samples were from camps. Another study in Iraq which used SF-8 and DSM-4 for PTSD which is similar to our study found no significant differences in SF-8 between the group with low PTSD and high PTSD [42]. However, they used a smaller sample with also different age from our study. The high prevalence of abnormal mental health is in no doubt troublesome; this high prevalence was found among adults in another study where severe mental health was in 44.7% of the population who was living in Syria [4].

Most scores on individual question of PCS and MCS were lower than what was found in Iraq [21]. However, that study comprised of 52 participants and they were chosen out of 408 as they had the lowest and highest score on PTSD measure. SF-8, mainly MCS, can reflect the psychological burden in the community, especially as depression and PTSD were screened and found to be very high in the Syrian community and that around 44.7% were screened positively for severe mental disorder [4].

Other Variables:

More males were working while being student than females. This could be from the society encouraging males to work and help their parents while discouraging females from working, especially at young ages. Another hypothesis can be that although no differences were found in being the house rented or not and gender, there were differences in estimated SES which could explain why males worked more or because males failed more years so they had to find a work. Females tended to spend more time on TV, while males spent more time on the Internet. Males were also found to smoke more and tend to smoke shisha with cigarette more frequently than females. These findings can simply result from females' fear of admitting the truth of actually being smokers, but this is unlikely as they were assured that their answers will remain anonymous. Around one third of school students are regular cigarette and/or shisha smokers. Students who had more distress from anger tended to smoke more.

Although being distressed from war was correlated with higher marks, When using forward linear regression, marks were only correlated with gender and working. We could not also determine whether working started after the ninth class grade or before it. Schools from some regions suffered less from PTSD as they are from higher SES and they are less likely to have suffered from war which could explain differences in PTSD, anger, and SF-8.

A study in Iraq demonstrated that 94% of the sampled was exposed to at least one traumatic event [21]. As smoking in our study was correlated with lower grades, working when was a school student, and living in a rented house or being in lower SES, it was found that in Syria over than one-third is a regular smoker [6] which is similar to our study which demonstrates no big difference between school students and adults in smoking prevalence. Smoking was also found to be correlated with allergic rhinitis [8], and laryngopharyngeal reflux in Syria which were all correlated with being distressed from war noises.

Limitations:

- This study was conducted in Damascus, not in areas that were more severely affected. Furthermore, this study was conducted in public schools without students from private schools and children who dropped out or had to drop out from trauma from war. This all indicate that this study has underestimated the true prevalence of PTSD and other war variables.
- This study could not cover more areas due to COVID-19 outbreak worldwide and Syria going to lock down.
- Only screening surveys were used; no clinical diagnosis could be used due to unavailability of resources.
- There was no valid scale of SES due to no scale could be practically used in Syria due to different salaries and the social values that refuse to declare all financial income.
- The participants were left with the freedom of answering whatever questionnaire they chose, meaning there were some participants who would answer a questionnaire while leaving the other.
- Could not indicate when the events of war occurred in relation to the time of questionnaire.
- The psychiatric aspect of the parents could not be assessed.
- School performance was only assessed by one exam which although it is unified, it cannot alone determine the performance of the student, especially that most students will work very hard to excel at this particular exam.

Conclusion

More than half of Syrian students in schools were screened positive for PTSD and distress from anger while social support played little role. The high prevalence of abnormal mental health and general health indicate a serious disaster as these are the young generation. Around one third had only some energy and around one quarter found it difficult to work. Females were affected more. War was significantly associated with worse HRQL, either mentally or physically. Students with PTSD had more problems from anger, were exposed more to war, and tend to do negative habits more often such as cigarette and shisha smoking and spending more time on TV and the Internet. The high PTSD prevalence while having relatively low overall SF-8 scores may suggest that children who grew up in traumatic events may cope better and get used to it that they may exhibit or express lower evaluation of their days and themselves in PCS and MCS while adults may have worse adaptation methods. Meanwhile, PTSD and anger burden grow heavier in the consecutive years. Consanguinity and type of work had different effects on PTSD and anger distress. Social support had correlations with PTSD, HRQL, and anger. Students who had distress from anger tended to smoke more, but not to smoke larger quantities. Students who had distress from anger also used the internet by 9 hours more than who did not have distress. Interestingly, work was correlated with better PTSD, but worse PCS. Interestingly, war variables did not have a significant effect on school performance.

More studies are needed to determine whether working of children and the type of work had a real effect on their education, work and school grades and whether war had a direct effect on studying too as this paper could not find such a relation. Also, other studies are needed to evaluate parents' psychological effect on their children.

Abbreviations

COVID-19	Coronavirus disease of 2019
CRIS	Children's impact of event scale
DAR	Dimensions of anger reactions
DSM	Diagnostic and statistical manual of mental disorders
HRQL	Health-related quality of life
ICD	International Classification of Disease
MCS	Mental component summary
MSPSS	Multidimensional Scale of Perceived Social Support
PCS	Physical component summary
PTSD	Post-traumatic stress disorder
SES	Socioeconomic status
SF	Short Form
STAXI 2	State Trait Anger Expression Inventory-2

Declarations

Ethics approval and consent to participate:

Our study protocol and ethical aspect were reviewed and approved by Damascus University, faculty of medicine ethic committee in Damascus, Syria. It was also approved by Damascus University vice president for scientific affair, Damascus University faculty of medicine vice dean for scientific affairs, and by minister of education.

Written consent was given from the caregivers before proceeding with the survey by one week when children were younger than 18 years, and for using and publishing the data. Written consent was also taken when the participant was 18 years or older. Confidentiality was assured and no identity-revealing questions were asked. Another oral consent was also taken from the students before giving the survey regardless of age.

Consent for publication:

Written consent for using and publishing the data was taken before participating in the research from the caregiver when the student was younger than 18 years and from the student when was 18 years or older.

Availability of data and materials:

The data can be made available upon reasonable request.

Competing interests:

We have no conflict of interest to declare.

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Authors' contributions:

AK: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Supervision; Resources; Validation; original draft; Writing - review & editing.

RAZ: Investigation; Project administration; Supervision; Resources; Methodology

AA: Investigation; Data curation; Methodology; Formal analysis; Software; Data curation.

RNKA: Investigation; original draft; Writing - review & editing

OHA: Investigation; Resources; Project administration

MMA: Methodology; Validation; Software; Conceptualization.

AG: Software; Resources; Conceptualization.

YL: Supervision; Resources; Validation.

All authors have read and approved the manuscript.

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Tables

TABLE 1

Characteristics of the subjects with their responses to the questions and frequencies.

Characteristic	Frequency (Percentage%)	Characteristic	Frequency (Percentage%)
Gender		Being distressed from the war noises	
Male	723 (52.8)	No	516 (39.0)
Female	646 (47.2)	Yes	807 (61.0)
Class		Type of work:	
10 th grade	648 (47.4)	Waiter	55 (4.0)
11 th grade	646 (47.2)	Education	6 (0.4)
12 th grade	74 (5.4)	Retail Worker	186 (13.6)
District of origin		In an office	15 (1.1)
Damascus, Rif-Dimashq, and Aleppo	833 (64.0)	Labourer	36 (2.6)
Homs and Hama	99 (7.6)	Handicraft	92 (6.7)
Al-Jazira region	62 (4.8)	Industry	21 (1.5)
Southern Syria	74 (5.7)	Design	7 (0.5)
Syrian coast	155 (11.9)	Chef	2 (0.1)
Idlib	15 (1.2)	Prefer Not to Say	80 (5.8)
Other	63 (4.8)	Losing someone due to the war	
Consanguinity		No	734 (60.2)
No	1020 (75.8)	One close person	409 (33.5)
Yes third-degree relatives	158 (11.7)	Two close persons	57 (4.7)
Yes fourth-degree relatives	64 (4.8)	Three close persons	16 (1.3)
Yes but not close relatives	103 (7.7)	Four close persons or more	4 (0.3)
Schools according to zones		Were you directly endangered from the war?	
Northern area	593 (43.3)	No	553 (42.0)
Southern area	429 (31.3)	Yes	763 (58.0)
Western area	347 (25.3)	Changing place of living due to war	
Chronic Medical Conditions		No	629 (47.8)
Negative	1104 (86.0)	Yes	687 (52.2)
Gastroenterology	5 (0.4)	Do you regularly smoke?	
Pulmonology	9 (0.7)	No	907 (66.9)
Cardiology	16 (1.2)	Yes cigarettes	69 (5.1)
Endocrinology	25 (1.9)	Yes shisha	248 (18.3)
Urology	6 (0.5)	Yes, both	111 (8.2)
Nervous	17(1.3)	Yes, other	6 (0.4)
Skeletal	16 (1.2)	Former smoke	14 (1.0)
Asthma	22 (1.7)	Reported feeling peer-pressured into smoking	
Allergy	35 (2.7)	No	208 (83.9)
Ophthalmology	10 (0.8)	Yes	40 (16.1)
Psychiatry	2 (0.2)	Reported feeling more adult when smoking	
Other	1 (0.1)	No	224 (92.9)
Two and more	15 (1.2)	Yes	17 (7.1)
House		Reported main reason for smoking	
Rented	315 (23.9)	For psychological relief	64 (50.4)
Owned	1004 (76.1)	For entertainment	63 (49.6)
SES Groups			
Lower	16 (1.3)		
Upper lower	269 (21.2)		
Lower middle	475 (37.4)		
Upper middle	466 (36.7)		
Upper	43 (3.4)		
Working			
No	861 (63.3)		
Yes, but only in summer times	295 (21.7)		
Yes in summer and holidays (week-ends)	105 (7.7)		
Yes, all year long	95 (7.0)		
Other times	5 (0.4)		
Reported that working has affected their studies significantly			
No	388 (78.4)		
Yes	107 (21.6)		
Reported that they liked their job			
No	103 (21.2)		
Yes	382 (78.8)		
Reported reason for working			
Entertainment	146 (32.4)		
To learn or develop a skill	47 (10.4)		
To provide personal expenses	111 (24.7)		
To help with family expenses	139 (30.9)		
Forced by the Family	4 (0.9)		
Other reason	3 (0.7)		
		Characteristic	Mean (SD)
		Age	16.38 (0.790)
		Number of people living in the house	5.86 (7.750)
		Number of working years (for people who have worked)	2.89 (1.895)
		Number of failed years in school	
		Number of times changing place of living due to war	0.05 (0.257)
		Average cigarettes smoked daily for smokers	
		Average Shisha smoked weekly for smokers	1.21 (1.791)
		Average weekly hours spent on TV	12.29 (10.739)
		Average weekly hours spent on the Internet	2.58 (2.861)
		DAR 5 score	17.01 (16.274)
		Arousal score	30.01 (61.113)
		Avoidance score	14.70 (5.099)
		Intrusion score	9.46 (5.679)
		Family support score	8.52 (6.022)
		Significant other support score	8.38 (5.508)
		Friends support score	4.91 (2.077)
			5.53 (2.051)
			5.32 (2.089)
		Characteristic	CI=95%
		PTSD (Avoidance + Intrusion) Prevalence	53.0% (50.4-55.8) 62.2%
		Positive DAR 5 Prevalence	(59.6-64.7)
		Mean Physical Component Summary (PCS) score	15.51 (15.34-15.67)
		Mean Mental Component Summary (MCS) score	14.57 (14.40-14.76)

Reported being treated badly by boss		Declaring having fair general health or worse	46% (43.5-48.5)
Yes	64 (86.5)	Somewhat or quite limited physical functioning or worse	
No	410 (13.5)	Finding somewhat or more difficult to work from physical health (role physical)	30.9% (28.5-33.2)
Preferred time of smoking		Having moderate bodily pain or worse	26.5% (24.2-28.9)
With friends	244 (64.4)	Declaring having some energy or less (Vitality)	35.3% (33.0-37.9)
Morning	7 (1.8)	Declaring having somewhat or quite limited social functioning (or worse)	29.4% (26.9-31.8)
Evening	48 (12.7)	Having moderate mental health or worse	29.1% (26.7-31.5)
Undetermined	80 (21.1)	Having somewhat or more negative role-emotional	61.0% (58.2-63.5)
			32.5% (30.0-35.2)

Table 2
Demonstrates the mean answers of students of SF-8 with low or high PTSD probability according to intrusion and arousal scores, avoidance score, DAR 5 and social support scores.

Health-related quality of life subscale	Low Probable PTSD Group M (SD)	High Probable PTSD Group M (SD)	P value ^a	P value (correlation) ^b	Arousal ^c P value (correlation)	Negative DAR 5 M (SD)	Positive DAR 5 M (SD)	P value ^d	P value (correlation) ^e	Family support ^f P value (correlation)	Significant other support ^f P value (correlation)	Friends Support ^f P value (correlation)
General health	3.80 (0.87)	3.43 (0.951)	<0.001	<0.001 (r=0.239)	<0.001 (r=-0.303)	3.77 (0.869)	3.51 (0.960)	<0.001	<0.001 (r=-0.197)	<0.001 (r=0.118)	0.796 (r=0.007)	0.003 (r=0.081)
Physical functioning	4.27 (0.992)	3.94 (1.124)	<0.001	<0.001 (r=0.180)	<0.001 (r=-0.255)	4.33(0.986)	3.95 (1.110)	<0.001	<0.001 (r=0.206)	<0.001 (r=0.103)	0.978 (r=0.001)	0.004 (r=0.078)
Role-physical	4.35 (0.903)	3.88 (1.090)	<0.001	<0.001 (r=0.269)	<0.001 (r=-0.303)	4.33 (0.898)	3.95 (1.082)	<0.001	<0.001 (r=0.218)	<0.001 (r=0.116)	0.358 (r=0.025)	<0.001 (r=0.090)
Bodily pain	4.08 (0.899)	3.72 (1.045)	<0.001	<0.001 (r=0.237)	<0.001 (r=-0.312)	4.11 (0.900)	3.76 (1.025)	<0.001	<0.001 (r=0.214)	<0.001 (r=0.108)	0.760 (r=-0.008)	0.468 (r=0.020)
Vitality	3.98 (0.826)	3.58 (0.986)	<0.001	<0.001 (r=-0.261)	<0.001 (r=-0.361)	3.94 (0.801)	3.66 (0.992)	<0.001	<0.001 (r=0.209)	<0.001 (r=0.119)	0.012 (r=0.069)	<0.001 (r=0.114)
Social functioning	4.31 (0.947)	3.73 (1.172)	<0.001	<0.001 (r=-0.308)	<0.001 (r=-0.351)	4.32 (0.918)	3.80 (1.173)	<0.001	<0.001 (r=0.290)	<0.001 (r=0.143)	0.192 (r=-0.036)	0.543 (r=0.017)
Mental health	3.44 (1.197)	2.68 (1.233)	<0.001	<0.001 (r=-0.368)	<0.001 (r=-0.418)	3.41 (1.186)	2.82 (1.278)	<0.001	<0.001 (r=0.281)	<0.001 (r=0.160)	0.185 (r=-0.036)	0.053 (r=0.053)
Role-emotional	4.22 (1.027)	3.55 (1.189)	<0.001	<0.001 (r=-0.362)	<0.001 (r=-0.431)	4.21 (1.010)	3.66 (1.198)	<0.001	<0.001 (r=0.295)	<0.001 (r=0.196)	0.504 (r=-0.018)	<0.001 (r=0.099)
PCS	16.26 (2.861)	14.84 (3.294)	<0.001	<0.001 (r=-0.268)	<0.001 (r=-0.348)	16.32 (2.887)	15.01 (3.257)	<0.001	<0.001 (r=0.280)	<0.001 (r=0.143)	0.751 (r=0.009)	0.001 (r=0.088)
MCS	15.86 (2.953)	13.42 (3.442)	<0.001	<0.001 (r=-0.424)	<0.001 (r=-0.506)	15.76 (2.890)	13.84 (3.542)	<0.001	<0.001 (r=0.360)	<0.001 (r=0.207)	0.741 (r=-0.009)	0.001 (r=0.095)

MCS: Mental Component Summary; PCS: Physical component Summary.

^a P value is calculated by using independent sample t-test between the subscale and low and high PTSD group.

^b P value is calculated by using Pearson correlation between the subscale and intrusion + avoidance scores.

^c P value is calculated by using Pearson correlation between the subscale and arousal score.

^d P value is calculated by using independent sample t-test between the subscale and negative and positive DAR 5 which indicates psychological distress and functional impairment related to anger.

^e P value is calculated by using Pearson correlation between the subscale and DAR 5 score.

^f P value is calculated by using Pearson correlation between the subscale and support score.

Figures

Table 3
Demonstrates DAR 5 and social support correlations with PTSD (intrusion + avoidance) and arousal score

	Negative DAR 5 M (SD)	Positive DAR 5 M (SD)	P value ^a	P value (correlation) ^b	Family support ^b P value (r)	Significant other support ^c P value (r)	Friends Support ^c P value (r)
PTSD Scores	14.70 (9.666)	18.30 (9.890)	<0.001	<0.001 (r=0.266)	<0.001 (r=-0.127)	0.101 (r=0.045)	0.269 (r=-0.030)
Probable PTSD*	218 (43.1%)*	494 (59.2%)*	P<0.001 ^c	P<0.001 ^d	-	-	-
Not probable PTSD*	288 (56.9%)*	340 (40.8%)*					
Arousal score	7.25 (5.119)	10.85 (5.573)	<0.001	<0.001 (r=0.405)	<0.001 (r=-0.135)	0.902 (r=0.003)	0.026 (r=-0.061)
Family support score	5.15 (1.998)	4.76 (2.112)	<0.001	<0.001 (r=-0.161)	-	<0.001 (r=0.311)	<0.001 (r=0.233)
Significant other support score	5.53 (2.032)	5.53 (2.060)	0.945	0.127 (r=-0.042)	<0.001 (r=0.311)	-	<0.001 (r=0.397)
Friends Support score	5.49 (1.993)	5.23 (2.138)	0.027	<0.001 (r=-0.098)	<0.001 (r=0.233)	<0.001 (r=0.397)	-

^a P value was calculated by using independent sample t-test between the subscale and negative and positive DAR 5 which indicates psychological distress and functional impairment related to anger.

^b P value was calculated by using Pearson correlation between the subscale and support score.

^c P value was calculated by using Chi-square.

^d P value was calculated by t-independent test between DAR 5 score and probable PTSD

* These are nominal variables and the numbers refer to frequencies.

Figure 1

demonstrating PTSD and being distressed from anger prevalence according to school areas and gender.

Figure 2

demonstrating mean plots of working and type of work with mean students' grade.

TABLE 4

Comparisons between Characteristics and Physical and Mental Component Summary of SF-8

Characteristic	Physical component Summary (PCS) M (SD)	P value	Mental Component Summary (MCS) M (SD)	P value
Gender*				
Male	15.73 (3.126)	0.008	15.21 (3.265)	<0.001
Female	15.27 (3.222)		13.87 (3.498)	
Schools				
Northern area	15.78 (3.154)	0.026	14.63 (3.408)	0.559
Southern area	15.32 (3.090)		14.40 (3.621)	
Western area	15.29 (3.306)		14.64 (3.343)	
Consanguinity				
No	15.50 (3.237)	0.962	14.42 (3.504)	0.042
Yes third-degree relatives	15.52 (2.743)		14.88 (3.029)	
Yes fourth-degree relatives	15.28 (3.452)		14.86 (3.486)	
Yes but not close relatives	15.48 (3.143)		15.29 (3.210)	
Chronic Medical Conditions				
Negative		<0.001	14.83 (3.358)	<0.001
Gastroenterology	15.86 (3.044)		12.60 (2.302)	
Pulmonology	12.80 (4.658)		15.00 (2.000)	
Cardiology	14.56 (2.698)		12.80 (3.707)	
Endocrinology	12.60 (4.085)		12.84 (3.760)	
Urology	14.00 (3.640)		13.17 (4.119)	
Nervous	13.33 (3.830)		12.47 (3.466)	
Skeletal	14.24 (2.658)		14.19 (3.146)	
Asthma	13.50 (3.724)		14.55 (3.158)	
Allergy	13.41 (2.889)		13.51 (3.390)	
Ophthalmology	14.91 (3.166)		15.50 (3.206)	
Psychiatry	14.60 (2.119) 11.00 (-)		8.50 (3.536)	
Two and more	12.47 (3.980)		11.87 (4.340)	
Other	15.00 (-)		9.00 (-)	
Having a chronic medical condition?*				
No	15.86 (3.044)	<0.001	14.83 (3.358)	<0.001
yes	13.81 (3.366)		13.38 (3.541)	
SES				
Lower	14.50 (4.204)	0.041	13.33 (4.390)	0.021
Upper Lower	15.27 (3.336)		14.26 (3.591)	
Upper Middle	15.56 (2.855)		14.78 (3.344)	
Middle	15.64 (3.247)		14.62 (3.319)	
Upper	16.30 (3.377)		15.19 (3.375)	
House*				
Rented	15.39 (3.060)	0.341	14.46 (3.427)	0.460
Owned	15.58 (3.187)		14.63 (3.450)	
Working				
No	15.64 (3.142)	0.026	14.54 (3.440)	0.147
Yes, but only in summer times	15.54 (3.136)		14.93 (3.405)	
Yes in summer and holidays	15.15 (3.204)		14.35 (3.704)	
Yes, all year long	14.61 (3.551)		14.02 (3.223)	
Other times	16.60 (1.517)		15.80 (2.775)	
Reported that they liked their job*				
No	14.43 (3.435)	0.003	13.22 (3.702)	<0.001
Yes	15.50 (3.151)		14.97 (3.290)	
Reported reason for working				
Entertainment	15.77 (3.307)	0.235	15.29 (3.444)	0.058
To learn or develop a skill	15.64 (3.018)		14.62 (3.722)	
To provide personal expenses	14.93 (3.017)		14.14 (3.549)	
To help with family expenses	14.96 (3.312)		14.19 (3.442)	
Forced by the Family	15.50 (2.380)		13.00 (3.916)	
Other reason	15.00 (3.606)		16.00 (1.000)	
Reported being treated badly by boss*				
No	15.55 (3.135)	<0.001	14.89 (3.323)	0.001
Yes	13.52 (3.418)		13.11 (3.809)	
Type of work:				
Waiter	15.25 (3.146)	0.425	13.91 (3.513)	0.017
Education	13.33 (5.715)		11.33 (3.777)	
Retail Worker	15.23 (3.281)		14.69 (3.510)	
In an office	15.36 (2.818)		14.21 (2.940)	
Labourer	15.39 (3.797)		15.36 (3.382)	
Handicraft	14.90 (3.266)		14.09 (3.805)	
Industry	15.90 (2.625)		15.24 (2.791)	
Design	14.14 (2.795)		14.43 (3.101)	
Chef	17.50 (0.707)		18.50 (2.121)	
Prefer Not to Say	15.91 (2.904)		15.47 (2.759)	
Being distressed from the war noises*				
No	15.93 (3.017)		15.27 (3.277)	
	15.27 (3.266)		14.10 (3.467)	

Yes		<0.001		<0.001
Were you directly endangered from the war?*				
No	16.06 (3.110)		15.23 (3.230)	
Yes	15.12 (3.147)	<0.001	14.05 (3.517)	<0.001
Changing place of living due to war*				
No	15.74 (3.184)		14.80 (3.377)	
Yes	15.31 (3.179)	0.016	14.35 (3.467)	0.017
Do you regularly smoke?				
No	15.87 (3.087)		15.04 (3.265)	
Yes cigarettes	15.04 (2.908)		14.29 (3.456)	
Yes shisha	14.87 (3.214)		13.64 (3.442)	
Yes, both	14.42 (3.600)		13.05 (4.033)	
Yes, other	14.67 (3.011)		15.67 (3.077)	
Used to smoke	14.64 (2.898)		13.21 (3.490)	
* Independent t-test was used while one-way ANOVA was used for the other variables				

TABLE 5

Comparisons between Characteristics with having PTSD (intrusion + avoidance), negative or positive DAR, and arousal scores with other variables.

Characteristic	Not Probable PTSD	Probable PTSD	P value	Negative DAR 5	Positive DAR 5	P value	Arousal M (SD)	P value
Gender								
Male	407	304	<0.001	271	442	0.847	8.35 (5.536)	<0.001
Female	229	413		240	400		10.69 (5.588)	
Schools								
Northern area	279	310	0.006	220	368	0.915	9.65 (5.552)	0.501
Southern area	220	204		164	261		9.41 (5.485)	
Western area	137	203		127	213		9.20 (6.125)	
Consanguinity								
No	466	546	0.637	362	648	0.064	9.54 (5.759)	0.820
Yes third-degree relatives	73	81		60	93		9.31 (5.384)	
Yes fourth-degree relatives	33	29		28	36		9.77 (6.039)	
Yes but not close relatives	51	51		49	53		9.08 (5.345)	
Chronic Medical Conditions								
Negative	536	556	0.111	423	668	0.867	9.17 (5.605)	<0.001
Gastroenterology	1	4		2	3		10.60 (3.847)	
Pulmonology	2	7		3	6		8.44 (5.681)	
Cardiology	7	8		6	12		13.20 (5.281)	
Endocrinology	8	17		7	18		11.80 (5.612)	
Urology	2	4		3	3		15.67 (1.862)	
Nervous	4	13		6	11		10.18 (4.825)	
Skeletal	7	9		4	12		11.06 (3.941)	
Asthma	11	11		8	14		10.09 (5.814)	
Allergy	16	19		12	21		11.06 (6.178)	
Ophthalmology	4	6		5	5		8.40 (3.978)	
Psychiatry	0	2		0	2		22.00 (4.243)	
Two and more	3	12		6	9		12.73 (6.017)	
Other	0	1		1	0		13.00 (-)	
Do you have a chronic medical condition?								
No	536	556	0.002	423	668	0.316	9.17 (5.605)	<0.001
yes	65	113		62	116		11.28 (5.531)	
SES								
Lower	7	9	0.066	6	10	0.700	10.44 (6.572)	0.632
Upper Lower	112	154		91	172		9.94 (5.964)	
Upper Middle	237	231		181	290		9.41 (5.341)	
Middle	211	251		173	290		9.40 (5.693)	
Upper	14	29		19	23		9.05 (6.067)	
House								
Rented	148	163	0.756	108	202	0.222	9.71 (5.543)	0.315
Owned	463	531		385	610		9.34 (5.729)	
Working								
No	373	481	0.025	338	515	0.368	9.73 (5.716)	0.104
Yes, but only in summer times	153	138		105	187		8.67 (5.628)	
Yes in summer and holidays	55	48		33	71		9.41 (5.737)	
Yes, all year long	50	43		32	60		9.67 (5.290)	
Other times	3	2		1	4		9.20 (3.271)	
Reported that they liked their job								
No	50	52	0.411	28	74	0.110	9.88 (5.924)	0.102
Yes	201	174		135	241		8.87 (5.424)	
Reported reason for working								
Entertainment	86	59	0.197	50	94	0.877	9.15 (5.548)	0.879
To learn or develop a skill	18	28		13	34		8.65 (5.143)	
To provide personal expenses	53	58		33	76		9.15 (5.474)	
To help with family expenses	69	68		47	90		9.69 (5.744)	
Forced by the Family	2	2		2	2		9.50 (3.317)	
Other reason	2	1		1	2		11.00 (7.810)	
Reported being treated badly by boss								
No	223	181	0.068	146	258	0.030	8.77 (5.637)	0.002
Yes	27	36		14	49		11.13 (4.966)	
Type of work:								
Waiter	23	32	0.067**	18	37	0.109**	9.60 (5.479)	0.004**
Education	1	5		2	4		13.83 (7.705)	
Retail Worker	98	86		64	121		9.30 (5.236)	
In an office	8	6		6	8		9.29 (4.565)	
Labourer	15	20		17	19		8.06 (6.063)	
Handicraft	47	44		21	68		9.98 (5.955)	
Industry	15	6		8	13		6.95 (6.021)	
Design	3	4		1	6		11.57 (6.630)	
Chef	2	0		2	0		1.50 (2.121)	
Prefer Not to Say	49	28		32	46		7.35 (4.944)	
Being distressed from the war noises								
	293	218		198	312		8.19 (5.287)	
	317	481		293	507		10.36 (5.785)	

No								
Yes			<0.001			0.423		<0.001
Were you directly endangered from the war?								
No	283	265		230	316		8.53 (5.671)	
Yes	321	433	0.001	258	498	0.003	10.23 (5.584)	<0.001
Changing place of living due to war								
No	308	313		218	405		9.01 (5.658)	
Yes	301	380	0.051	267	412	0.106	9.93 (5.636)	0.003
Do you regularly smoke?								
No	435	461	0.068	405	492	<0.001	8.96 (5.619)	<0.001
Yes cigarettes	37	31		14	55		9.19 (5.772)	
Yes shisha	98	149		56	190		10.81 (5.466)	
Yes, both	46	63		25	84		11.14 (5.628)	
Yes, other	4	2		2	3		6.50 (3.937)	
Used to smoke	5	9		3	11		10.86 (6.371)	

* P value is calculated when using one-way ANOVA and independent t-test.

** When using having no work variable among types of work, P<0.001 for PTSD scores, P=0.72 for DAR-5 scores and P=0.002 for arousal with having no work mean score = 9.73 (5.716).

Table 6
Demonstrates DAR 5, PTSD (intrusion + avoidance), arousal, and social support correlations with numeric variables.

	Negative DAR 5 M (SD)	Positive DAR 5 M (SD)	P value ^a	P value (correlation) ^b	Not Probable PTSD M (SD)	Probable PTSD M (SD)	P value ^a	P value (correlation) ^b	Family support ^c P value (r)	Significant other support ^c P value (r)	Friends Support ^c P value (r)	Arousal P value @
Number of people living in the house	6.26 (12.453)	5.63 (2.184)	0.162	0.224 (r=-0.034)	5.67 (1.973)	6.03 (10.516)	0.409	0.871 (r=0.005)	0.090 (r=-0.047)	0.029 (r=-0.061)	0.805 (r=-0.007)	0.913 (r=-0.003)
Number of failed years	0.06 (r=0.319)	0.04 (r=0.213)	0.280	0.451 (r=-0.021)	0.06 (r=0.300)	0.05 (r=0.215)	0.404	0.370 (r=-0.25)	0.347 (r=-0.026)	0.386 (r=0.024)	0.696 (r=-0.011)	0.684 (r=0.011)
Number of working years (for people who have worked)	2.62 (1.734)	3.03 (1.934)	0.036	0.307 (r=0.050)	2.81 (1.878)	3.02 (1.913)	0.260	0.387 (r=0.42)	0.001 (r=-0.159)	0.067 (r=-0.090)	0.094 (r=-0.082)	0.116 (r=0.077)
Number of time changing place of living due to war	1.22 (1.726)	1.21 (1.840)	0.913	0.772 (r=0.008)	1.13 (1.823)	1.28 (1.764)	0.141	0.023 (r=0.065)	0.029 (r=-0.062)	0.324 (r=-0.028)	0.321 (r=-0.028)	<0.001 (r=0.094)
Number of close people who lost due to war	0.45 (0.639)	0.50 (0.703)	0.235	0.327 (r=0.028)	0.45 (0.618)	0.51 (0.730)	0.080	<0.001 (r=0.097)	0.004 (r=-0.083)	0.265 (r=0.032)	0.710 (r=-0.011)	0.002 (r=0.091)
Average cigarettes smoked daily for smokers	10.85 (10.075)	12.46 (10.836)	0.402	0.540 (r=0.045)	11.84 (10.754)	12.66 (10.811)	0.602	0.114 (r=0.115)	0.106 (r=-0.118)	0.512 (r=-0.048)	0.923 (r=0.007)	0.568 (r=0.042)
Average Shisha smoked weekly	2.23 (2.227)	2.66 (2.990)	0.259	0.325 (r=0.053)	2.53 (2.704)	2.62 (2.979)	0.756	0.458 (r=0.040)	0.031 (r=-0.116)	0.978 (r=0.002)	0.136 (r=-0.081)	0.360 (r=0.049)
Average weekly hours spent on TV	15.25 (13.059)	18.15 (17.917)	0.004	<0.001 (r=0.116)	15.33 (13.719)	18.38 (17.978)	0.002	<0.001 (r=0.116)	0.308 (r=-0.031)	0.291 (r=0.032)	0.164 (r=-0.042)	<0.001 (r=0.104)
Average weekly hours spent on the Internet	24.26 (17.644)	33.55 (76.126)	0.011	0.039 (r=0.059)	30.97 (86.779)	29.10 (22.078)	0.599	0.861 (r=0.005)	0.275 (r=-0.032)	0.743 (r=0.009)	0.771 (r=0.008)	0.134 (r=0.043)

^a P value is calculated by using independent sample t-test.

^b P value is calculated by using Pearson correlation between the subscale and DAR 5 score.

^c P value is calculated by using Pearson correlation between the subscale and support score.