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Post-traumatic stress disorders in Syrian children and adolescents exposed to the conflict: A systematic review and meta-analysis of the prevalence and its determinants

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GRATITUDE

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Last but not least, I dedicate my work to all Syrian children and every child who suffered from unhumanitarian conditions. Hopefully, this work sheds a light on their suffering, aiming for a brighter future for them.

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LIST OF ABBREVIATIONS AND SYMBOLS

PTSD – Post-traumatic stress disorder
UN – United Nations
PRISMA – Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PROSPERO - Prospective Register of Systematic Reviews
ICRC – International Committee for the Red Cross
WHO – World Health Organization
SOHR – Syrian Observatory for Human Rights
TB – Tuberculosis
HIV – Human Immunodeficiency Virus
UNHCR – United Nations High Commissioner for Refugees
UNOCHA – United Nations Office for the Coordination of Humanitarian Affairs
UNICEF – United Nations International Children's Emergency Fund
IDP – Internally Displaced Person
CRIES – Child Revised Impact of Events Scale
UCLA RI – The University of California at Los Angeles Reaction Index
DSM – Diagnostic and Statistical Manual of Mental Disorders
CPSS – Child Post-traumatic Stress Disorder Symptom Scale
CBCL – Child Behavior Checklist
PTSDSSI – Posttraumatic Stress Disorder Semi-Structured Interview
Kinder-DIPS – Diagnostisches Interview bei psychischen Störungen im Kindes- und Jugendalter
PTRI-C – Post-traumatic Reactions Index for Children

ABSTRACT

A decade of ongoing armed conflict in Syria has affected millions of people. One of the most significant consequences is mental health illness in children and adolescents. Exposure to traumatic events, as conflicts, can result in mental, behavioral, and emotional problems in children and adolescents. Though several studies have assessed the prevalence of post-traumatic stress disorders among children and adolescents exposed to conflicts, a systematic approach to the issue, taking into account the specific contexts and culture of Syrian children and adolescents, is still lacking. This study aims to systematically review the literature on the prevalence of post-traumatic stress disorder among Syrian children and adolescents who were exposed to the Syrian conflict since 2011. It explores factors and determinants that mediate the exposure to armed conflict and post-traumatic stress disorder.

This systematic review makes use of three databases (PubMed, Scopus, and PsychINFO) and grey literature, as reports of international non-governmental organizations such as World Health Organization, United Nations International Children's Emergency Fund, and United Nations High Commissioner for Refugees, issued between March 2011 and January 2021. Two authors performed the eligibility assessment and assessed the quality of selected articles. Meta-analysis was conducted using random effects. This systematic review followed PRISMA guidelines and was registered in PROSPERO (CRD42021226619).

In total, 26 eligible studies provided cross-sectional data for 11.401 Syrian children and adolescents under the age of 18, surveyed in eight countries with two types of assessment methods (self-report questionnaire and personal psychiatric interview). A meta-analysis of these studies indicates prevalence rates of 36.5% (6.3%–65.3%) for post-traumatic stress disorder. Several determinants were identified. These could be conflict-related, as the death of an important family member or an important person, witnessing clashes, violence, seeing dead bodies, and being internally displaced, socioeconomic and psychosocial, as social deprivation, social withdrawal, and

low parental/maternal attachment. Social trust and social support were protective factors.

This study shows that post-traumatic stress disorder is highly prevalent among Syrian children and adolescents exposed to the Syrian conflict, and more prevalent than in most other contexts. It emphasizes the urgent mental health needs and encourages immediate interventions to mitigate the massive suffering for the conflict-affected children and adolescents.

KEYWORDS

post-traumatic stress disorder, mental illness, children, adolescents, systematic review, meta-analyses, conflict, refugees, Syria

1. CONTEXTUALIZATION

1.1. Armed conflicts and their impact on public health

Armed conflicts are major public health issues. They kill, displace, and inflict misery worldwide. Conflicts have been the main reason for ill health and mortality for most of human history and remain a great threat to sustainable development. (Christopher JL Murray, 2002) The United Nations (UN) Sustainable Development Goals plead countries to significantly reduce all forms of violence and related death rates everywhere. (UN, 2016)

Nevertheless, several armed conflicts are going on across the world and millions of individuals have been harmed and affected. The International Humanitarian Law groups conflicts in two forms: international armed conflicts, involving two or more States, and non-international armed conflicts, between governmental forces and nongovernmental armed groups, or between these groups. (ICRC, 2008)

The impact of armed conflicts on populations occurs both from the direct consequences of fighting — specifically, battle deaths and injuries — and from its indirect consequences, which may happen for several years after a conflict is over.(Ghobarah Hazem, 2003)

Although direct consequences of combat - casualties and widespread infrastructure destruction - capture the main interest of the international community, the direct impact of armed conflicts is the tip of the iceberg. Limited medical care access, ill health, enforced dislocation of population, and economic collapse are some of the indirect consequences, and evidence indicates that, in terms of mortality, the indirect burden of armed conflicts was between three and fifteen times the number of direct deaths in the majority of the conflicts since the 1990s. (Geneva Declaration Secretariat, 2008) As many of the indirect consequences only become apparent over time, politicians and individuals with the most influence over initiating conflicts frequently fail to take these outcomes into account.

1.1.1. Death, trauma, and injuries

Mortality depends on the intent of violence, on the types of weapons used, and their destructiveness – shelling and bombing can cause more widespread destruction and mortality than one-to-one fighting.(Scott Gates, 2010) Weapons may cause more than just physical trauma: chemical (e.g., sarin gas, mustard gas, and chlorine) and nuclear weapons cause direct, and many times chronic damage to population health. Many injuries and causalities lead to long-term disabilities, which can be worsened by limited rehabilitation and hindered healthcare services. (WHO, 2011)

Armed conflict causes an enormous amount of death and disability across the world. (Sidel & Levy, 2008) In 2019, there were 54 active armed conflicts in the world and 51,000 casualties were recorded - about half the casualties recorded in 2016. (Håvard Strand, 2020).

1.1.2. Communicable diseases

There are several risk factors known to enhance the emergence and transmission of infectious diseases in conflict settings, as the damage of water and sanitation infrastructures, the destruction of the transport networks, limiting access to secure food, vaccines, and other medications, the breakdown of health services, with inadequate public health surveillance, compromised health response and interruption of disease control programs. This leads to major challenges in the prevention, detection, and control of emerging or re-emerging infectious diseases and outbreaks in conflict situations and makes infection control efforts even more insufficient in developing countries affected by these conflicts. (Gayer et al., 2007)

Furthermore, the destruction of houses leads to overcrowding and homelessness, with exposure to environmental risks, inadequate access to clean drinking water and conditions for sanitation and hygiene, and close physical contact, impose serious challenges in implementing the recommended public health and social measures to limit the transmission of infectious

diseases. As such, populations living in conflict areas and displaced groups are at higher risk of being infected with measles, hepatitis B, hepatitis C, latent or active tuberculosis (TB), human immunodeficiency virus (HIV), malaria, and other vaccine-preventable diseases, as well as COVID-19, which has been posing further major threats to populations affected by conflict crises and enforced displacement. (Shetty, 2019; UNHCR, 2021b; WHO, 2021)

Indeed, between 2009 and 2017 364 outbreaks occurred in 108 refugee camps from 21 countries. Measles, cholera, and meningitis accounted for 75% of the outbreaks. Over the entire period, at least one type of disease outbreak was experienced by 90% of the studied refugee camps. About half of the diseases presented fecal-oral transmission, the other half were airborne, and only one of the infections causing outbreaks was vector-borne.(Altare et al., 2019) In 2004, an outbreak of rash and fever began in four Liberian refugees camps in cote d'Ivoire, from which sixty-one percent of the refugees tested positive for measles. The highest incidence rate was seen in children under nine months of age.(Kouadio Koffi Isidore, 2011) Similar outbreaks among refugees have been reported, including poliovirus outbreak in Deir Elzzor city in Syria, hepatitis A and measles outbreaks in Syrian refugees camps in Lebanon, Turkey, and Jordan. (Bizri et al., 2018; UNICEF WHO, 2018)

1.1.3. Non-communicable diseases

Enforced displacement and conflict stressors can contribute to a higher prevalence of stress-related non-communicable diseases such as diabetes, heart diseases, neurological and psychiatric diseases, and gastrointestinal diseases. (Fricchione, 2018; Garry & Checchi, 2020; Narayan et al., 2010) Moreover, displacement can disrupt access to treatment for these diseases or delay diagnosis. In addition, low income and enforced displacement may increase unhealthy behaviors, such as alcoholism, higher tobacco consumption, and as well as unhealthy diets.(UNHCR, 2021e)

Mental health problems, alongside cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes are among the greatest causes of preventable illness, disabilities, and mortalities among the conflict-affected

population worldwide. Refugees have a higher prevalence, incidence, and mortality rate for diabetes than host populations, with higher rates observed in women than men depending on the country of origin, and higher rates of heart attack, stroke, and hypertension were often identified in refugees compared to the host communities in the World Health Organization (WHO) European Region. (WHO, 2019)

1.1.4. Mental health

Among the consequences of armed conflicts, the impact on the mental health of the conflict-affected population is one of the most significant. (Murthy RS, 2006) The exposure to traumatic events and violence, enforced displacement, lack of basic needs, insecurity, and the loss of protective factors such as family members put individuals at higher risk for post-traumatic stress disorder (PTSD), anxiety, depression, and sleep disorders.(Mpembi et al., 2018) (Gordon S, 2010, Bogic et al., 2015) Moreover, individuals with previous mental health problems can be further exposed to other risks related to their health and wellbeing. (Dolan et al., 2008; Mental health foundation in the UK, 2021; Viron & Stern, 2010)

1.1.5. Impact on children's health

Armed conflicts increase substantially infants' and children's mortality rates, especially in the acute period after the onset of armed conflicts. (Carlton-Ford & Boop, 2010; Ghobarah et al., 2004; D. Guha-Sapir & Panhuis, 2004; ohn Grundy, 2008; Scott Gates, 2010) Children are especially vulnerable to poor living conditions, with higher incidence and fatality rates of diarrhea, pneumonia, and malnutrition. (Stuart Gordon, 2010; William J Moss, 2006) Children are also importantly at risk of mental illness, due to the loss of family members, experiencing conflict-related violence and adversities such as explosions and clashes, and lack of livelihood conditions. (Fazel, 2002; Trang Thomas, 2021)

In general, the adverse consequences persist after the conflict era, including mental health problems, hindering their development and future health.(Bogic et al., 2015; Buvinic et al., 2013; O'hare & Southall, 2007; Scott Gates, 2010)

1.2. Displacement of population: refugees, asylum seekers, and internally displaced persons (IDPs)

Based on the UN Refugee Convention, a refugee definition is someone who "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion, is outside the country of his nationality, and is unable to or, owing to such fear, is unwilling to avail himself of the protection of that country". (United Nations, 1951)

Sixty-eight percent of worldwide refugees originate from five countries only: Syria, 6.8 million, Venezuela, 4 million, Afghanistan, 2.6 million, South Sudan, 2.2 million, and Myanmar, 1.1 million. (UNHCR, 2021f) According to the UN High Commissioner for Refugees Agency, around 80% of refugees worldwide are being hosted by the neighboring countries, which include some of the world's poorest countries. These countries host one-third of all refugees, whereas high-income countries host only 16% of the world's refugees. (UNHCR, 2019)

Around half of the refugee population around the world are children and adolescents under the age of 18 (UNHCR, 2019). It was estimated that between 2018 and 2020 290,000 to 340,000 children were born into a refugee life, per year.(UNHCR, 2021f)

1.2.1. Enforced displacement health risks

Enforced displacement puts people at several health risks, especially when displacement occurs in refugee camps with no access to good living conditions, healthcare, education, security, and other structural conditions. Displaced populations and refugees, especially women and children, are further at high risk of physical and sexual violence, exploitation, and abuse. (Marija Obradovic, 2015; UNHCR, 2021b; UNICEF USA, 2017) Acute

malnutrition rates are higher than in host communities, particularly among displaced children, women, and the elderly,(O'hare & Southall, 2007; Scott Gates, 2010) and this can present as total nutrition deficiencies (such as in starvation) or particular micronutrient deficiency. (D. and W. G. van P. Guha-Sapir, 2002)

Accessibility to a comprehensive healthcare system can be challenging for the forcibly displaced population. Besides the lack of access to healthcare services due to the low capacity of the available medical services, the incapacity to afford the healthcare expenses, lack of legal documents that would provide access to them, cultural and language differences remain important barriers to access to adequate healthcare services.

1.3. The Syrian case

In March 2011, a multidimensional crisis started in Syria and developed soon into an armed conflict. This led to a humanitarian catastrophe, with extreme levels of violence, widespread destruction, violations of human rights. According to the Syrian Observatory for Human Rights, more than 606,000 people were killed since the beginning of the Syrian conflict. Of those, 25,048 were children under the age of eighteen. (SOHR, 2021)

In the decade that followed, a total of 13.4 million Syrians were forced to flee their homes. Of these, 6.7 million are internally displaced persons and 6.6 million are refugees.(UNHCR, 2021e) The Syrian conflict was described by the UN as the "worst man-made disaster the world has seen since World War II". (UN High Commissioner for Human Rights, 2017)

Syrians' physical health, mental wellbeing, and social well-being have declined substantially since the beginning of the crisis.(Cheung et al., 2020) As a result of the ongoing conflict and its severe economic consequences, nowadays, 12 million Syrians need health assistance, and around one-third of Syrians need routine maternal, reproductive, child, and neonatal health services, challenging

to access especially in the ongoing conflict areas and aggravated during Covid-19 pandemic. (International Rescue Committee, 2021).

The conflict caused new mental health problems related to displacement, family members' losses, and violence, and exacerbated pre-existing mental disorders. In addition, these problems were frequently aggravated by factors related to limited access to mental health care services, with shortage of professionals specialized in mental health (as psychologists and psychiatrists), expertise, facilities, and language barriers, in the new post-emergency contexts, namely in the countries of asylum. (Hassan et al., 2016) Women and men who were exposed to sexual or gender-based violence, children who have experienced exploitation, and the LGBT+ community are particularly vulnerable. Denial and misunderstanding of mental illness, and the associated stigma, inhibits seeking for mental health care, which further challenges the promotion of psychological well being and the prevention of mental illness among survivors of the conflict. (Hassan et al., 2016; Hedar, 2017)

2. INTRODUCTION

The Syrian crisis entered its tenth year. An - ongoing - armed conflict started in March 2011, exposing Syrians to violence and deprivation, with an impact on their physical and mental health. Syria went from the third-largest refugee-hosting country in the world to the largest refugee-producing country over the last decade. (UNHCR Syria, 2018). Since 2011 over 5.5 million people have fled the country and 6 million have been internally displaced. More than 80% of the people living in Syria are now living below the poverty line, due to the economic consequences of the conflict. (United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), 2020) In 2019, the total number of Syrian children in need of humanitarian aid exceeded 8 million, 2.6 million were internally displaced, and over 2.5 million were registered as refugee children in host countries. (UNICEF, 2019)

Armed conflicts are major public health issues as they have been a major cause of mortality and morbidity in human history (Taleb et al., 2014) and destroy life's basic conditions like access to food, water, education, and health care. (Christopher JL Murray, 2002; Garry & Checchi, 2020; UN, 2021) The Syrian armed conflict caused widespread destruction to the health care system, educational system, and other essential services infrastructure and resources, as adequate and safe shelters. (UNICEF, 2019) This led to internal and external displacement, making it difficult for families and individuals to have access to basic needs inside Syria and in asylum countries. (UNICEF, 2019)

According to the WHO, 10% of people exposed to traumatic experiences in armed conflicts around the world develop severe mental health issues, and another 10% develop behaviors that impair their ability to function effectively. (World Health Organization, 2001) Conflict-related emotional trauma can occur not only as a result of direct exposure to life-threatening experiences and violence, but also as a result of indirect stressors such as the injury, death, and separation of caregivers, economic hardship, displacement, and disruption of daily life (Giordano et al., 2019). In addition, long after reaching the host

countries, refugee and asylum-seeking children and adolescents continue to encounter difficulties and acculturation-related mental health issues, such as internalizing clashing native and host cultural values. (Karadag et al., 2018; Killian Thomas et al., 2018; Tabur et al., 2019)

Confronted with the chaos caused by armed conflicts, children are the most vulnerable to all of their consequences and especially to mental disorders such as PTSD, depression, and anxiety. (Attanayake et al., 2009) After traumatic adversities, around 70% of children develop stress reaction behaviors within the first month after the exposure and around 20–30% of children have full diagnostic criteria for PTSD within the first year. PTSD hinders the psychosocial development of young children and adolescents when they do not receive support and treatment. Also, it has serious effects on the academic and social performance of these children, leading to neuro-biological issues, impaired cognitive development, and educational and professional limitations in their future, putting them into further deprivation. Over the lifetime, the impact on productivity levels multiplies the impact of socioeconomic deprivation on these children and adolescents, leaving them further behind. To help to mitigate this long-term impact, early diagnosis and treatments of PTSD are necessary. (Killian Thomas et al., 2018)

Syrian children have been exposed to traumatic events and everyday difficulties, directly or indirectly related to the conflict, which have a significant effect on their psychological well-being. (Tabur et al., 2019) One study conducted in 2016 in Syrian public schools showed that PTSD was the most prevalent mental health disorder among Syrian children students who are between 8 and 15 years old. (Tabur et al., 2019) Children may experience acute PTSD with hyperarousal, re-experiencing, and sleep disruption, or chronic PTSD, characterized by dissociation, restricted affect, sadness, and detachment. PTSD patients may experience somatoform complications such as general health decline, chronic pain, and increased vulnerability to medical problems, possibly leading to a rise in many medical disorders.(Karadag et al., 2018) According to the National Collaborating Centre for Mental (National Collaborating Centre for Mental Health (UK), 2005), PTSD symptoms may

cause significant disability and affect occupational, social, and educational performance and functioning. Moreover, studies show that the behavioral and cognitive response to trauma in childhood can be accompanied by epigenetic changes, posttranslational modifications, and unregulated inflammatory responses. (Kar, 2009) Though, recent psychosocial studies have discovered that, despite being subjected to dehumanizing environments, children have an immense potential for resilience allowing them to grow up to be fully functional individuals despite their childhood traumas. (Karadag et al., 2018) Some protective mechanisms have been identified which include emotional regulation, self-control, problem-solving skills, a close relationship with caregivers. (Tabur et al., 2019)

Several studies have assessed PTSD prevalence among children and adolescent refugees. These studies are much needed so that organizations and decision-makers can understand the size of this public health issue and effectively plan interventions and services to diagnose and treat the affected individuals, preventing the progression of mental illness. However, a systematic approach to this issue, focusing on the issue among children and adolescents exposed to the Syrian conflict, is needed to better address and inform about its magnitude and determinants, bearing in mind their very specific life path, contexts, and culture. Studies about the mental health of refugees – including PTSD - often ignore the cultural and social structures of the refugee population, (Giordano et al., 2019) treating all refugees as homogeneous populations, without stratification by country and background, ignoring the vast and substantial differences of cultures, exposures and influencing factors that may exist (Karadag et al., 2018). This work aims to fill in this gap in the literature and systematically review the prevalence of PTSD among Syrian children and adolescent refugees and identify its risk and protective factors.

3. METHODS

We conducted a systematic review and meta-analysis on PTSD prevalence and its determinants among Syrian children and adolescents who were exposed to the Syrian conflict.

3.1. Search Strategy and Selection Criteria

We undertook a systematic search strategy during November and December 2020 in MEDLINE (via PubMed), Scopus, and PsycINFO databases. We used a combination of Medical Subject Headings (MeSH terms) with related search keywords to widen the search records scope and minimize the fall out missed studies as much as possible. We included Post-Traumatic Stress Disorders (or other potential equivalents as PTSD, Posttraumatic Stress Disorders, Stress Disorder, Post Traumatic, Stress Disorders, Posttraumatic, Acute Post-Traumatic Stress Disorder, Chronic Post-Traumatic Stress Disorder, Delayed Onset Post-Traumatic Stress Disorder, Moral Injury, Neuroses, Post-Traumatic, Neuroses, Posttraumatic, child (or child*, preschool, infant) and adolescent (or adolescen*, teen*, youth), Syria (or Syrian).

The search strategy was adapted for each database. We further examined each article's reference list to find further eligible studies. Grey literature was also included, both from references' scan and from Google Scholar, searching reports from nongovernment international organizations such as United Nations High Commissioner for Refugees (UNHCR), United Nations International Children's Emergency Fund (UNICEF), and WHO that could provide data on the prevalence and determinants of PTSD in Syrian children and adolescents.
References in the selected articles that mentioned the PTSD prevalence of Syrian children were screened as well.

The date limits of the search were March 15th, 2011, to January 1st, 2021. The first date reflects the start of the Syrian conflict. Studies assessing

the prevalence of PTSD among Syrian child and adolescent populations, regardless of their country of placement or visa legal status inside and outside Syria (which included citizens inside Syria, refugees, asylum seekers, internal and external displaced target population) were included and extracted for this systematic review and meta-analysis. The diagnosis of PTSD could have been done by clinical psychiatric interviews or by self-report questionnaires done by trained professionals. There were no limits for the sample size. There were no language restrictions and all of the full text assessed papers were in English except one, in Turkish, which was translated by an online translation website (https://www.translate.com/). Qualitative, case reports or other studies without quantitative primary data on the prevalence of PTSD were excluded.

One reviewer (JK) screened titles, abstracts. When abstract or title screening was not enough to opt for inclusion or exclusion of the article, a full-text review was done to verify if the studies met the inclusion and exclusion criteria (namely if they presented primary data on the prevalence of PTSD among children or adolescents). If there were hesitations over the eligibility of particular studies, those were resolved by a second reviewer (TL) who has assessed these studies. Only when consensus was reached, these studies were retained.

3.2. Data extraction

The extracted information included the prevalence of PTSD, method of diagnosis, place of stay, visa status and participants characteristics such as age and gender and all of the remaining factors and determinants assessed in the selected studies by the first author (JK) then assessed independently by the second author (TL).

We extracted the prevalence of PTSD, age, gender, country of stay, visa status, the accommodation, the duration of stay in the current country, traumatic events type, and risk or protective factors identified by the studies. These factors were characterized as “risk” or “protective” if statistical analyses

showed a statistically significant positive or negative association with PTSD, or with “no association” when the association was not statistically significant. We also collected sample sizes and details on PTSD assessment methods (self-report questionnaire or personal psychiatric interview).

3.3. Risk-of-Bias Appraisal

The quality of the included studies was assessed by both of the reviewers (JK and TL) using a study assessment tool provided by the U.S. National Health Institute (available online at https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools). Items related to study quality such as internal and external validity, reporting bias, confounding, and conflict of interest were assessed by the first author (JK) and doubts were discussed with (TL).

We avoided limiting the search in terms of language in order to provide more local insight and prevent bias in the review’s findings. Having two reviewers (JK and TL) from Middle Eastern and European backgrounds may have contributed to avoiding ethnocentric bias.

3.4. Meta-analysis methodology

We performed a meta-analysis to estimate the PTSD prevalence of the pooled included studies using STATA software with Metaprop command and a random-effects model. (Nyaga et al., 2014).

The protocol for this systematic review and meta-analysis was registered in PROSPERO (CRD42021226619). We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

PRISMA checklist can be found online at: http://prisma-statement.org/prismastatement/Checklist.aspx

4. RESULTS

4.1. Description of the studies included

A flowchart that outlines the three databases search results (PubMed, Scopus, and Psych INFO) and the grey literature selection of studies is provided in Figure 1. The electronic databases search yielded a total of 239 publications and the screening of articles' reference lists and grey literature resulted in adding one grey literature publication. After removing 119 duplicates, 121 documents were assessed based on title, abstract and full-text assessment, when needed. Out of 121 records, 95 records were excluded as they did not mention prevalence (50), only included adults (35), studies did not show data for Syrian refugees (8), or did not show data stratified by age group (2).

A total of 26 studies about Syrian child and adolescent populations fulfilled the inclusion criteria and were in this systematic review and meta-analysis, with 11.401 participants of Syrian children and adolescents in eight different countries. Most studies were conducted in Turkey (n=14), in addition to Jordan (n=3), Lebanon (n=1) and one study included participants in Lebanon and Jordan (n=1), and Syria (n=2). There were four studies in Europe: in Germany (n=2), Sweden (n=1), and Italy (n=1); and one study referred to the United States (n=1). The participants' visa status ranged between refugees (n=23), citizens inside Syria (n=2), and indefinite transit asylum seekers (n=1). Sample sizes ranged between 31 and 1773 participants. Studies included participants from both genders and most had a statistical balance between females and males. There were no major issues concerning the studies' quality assessment in total, all of the studies' populations were clearly specified and defined.

All of the exposure measures (independent variables) and outcomes were clearly defined, valid, and reliable.

All studies inclusion and exclusion criteria for being in the study were prespecified and applied uniformly to all participants.

However, none of the outcome assessors were blinded to the exposure status of participants due to the comprehensive and widespread conflict exposure throughout Syria.

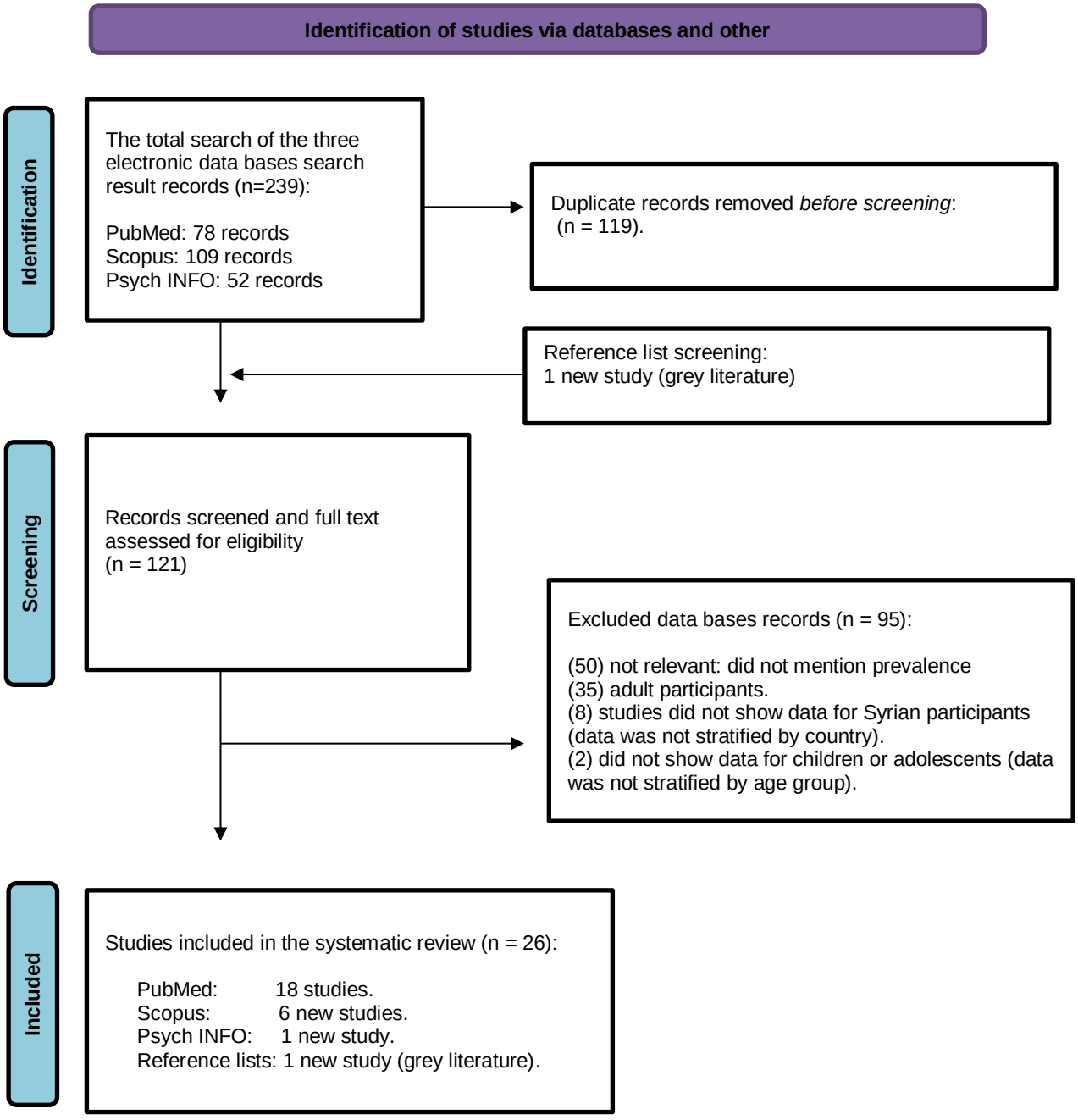

Figure 1: Flowchart outline of the systematic review's stages

4.2. PTSD prevalence estimates and risk factors

PTSD prevalence estimates ranged between 6.3% and 65.3%. 22 studies used self-report questionnaires as assessment tools of PTSD. Children's Revised Impact of Event Scale-8 (CRIES-8) (n=7) and the UCLA PTSD Reaction Index for the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (n=5) were the most frequently used self-report questionnaires. 4 studies used clinical psychiatric interview assessment.

Most of the studies identified as traumatic events those directly related to the conflict: the death of a parent or someone important (as parents, family members, or acquaintances), having witnessed violence against someone, clashes, or blasts, or seeing injured people or dead bodies. Being internally displaced, living in Damascus (Syria), compared to Latakia (Syria), and in Lebanon, compared to Jordan, had an increased risk for PTSD.

A low score of perceived parental/maternal attachment, using social withdrawal, self-criticism, and resignation as coping styles, and comorbidity of depression and anxiety were risk factors for PTSD. Social deprivation was also found in one study as a risk factor for PTSD in Syrian children and adolescents. Social trust and social support were found to be protective factors alongside cognitive restructuring, express their feelings inside the family, and higher parental attachment. Having a holiday/summer employment was a protective factor, as well as a longer stay in the host country.

Being a female was a risk factor in five studies, meanwhile being a male was a risk factor in the other two studies, and there was no association with gender in eight studies. Considering age, it was not associated with a higher risk of PTSD in seven studies but being older (14-17 years old) was a risk factor in one study. Living with 8 or more family members was a protective factor in one study, but family size had no association with PTSD in another study. Parental styles and relationships, and socioeconomic determinants were protective in some studies but others did not find significant associations.

Although deprivation was identified as a risk factor in some studies, this association was not found in other studies.

There was no association with the school environment, speaking the host country's language, and satisfaction with living conditions.
The detailed results can be found in Table 1.

4.3. Meta-analysis

Meta-analysis estimation of PTSD prevalence of the pooled included studies shows that 36% of the Syrian children and adolescent suffers from PTSD (95% confidence interval [0.29;0.43], p-value<0.001). The heterogeneity was substantial (I^2=98.56), (d.f. = 26).

The results are presented in Figure 2.

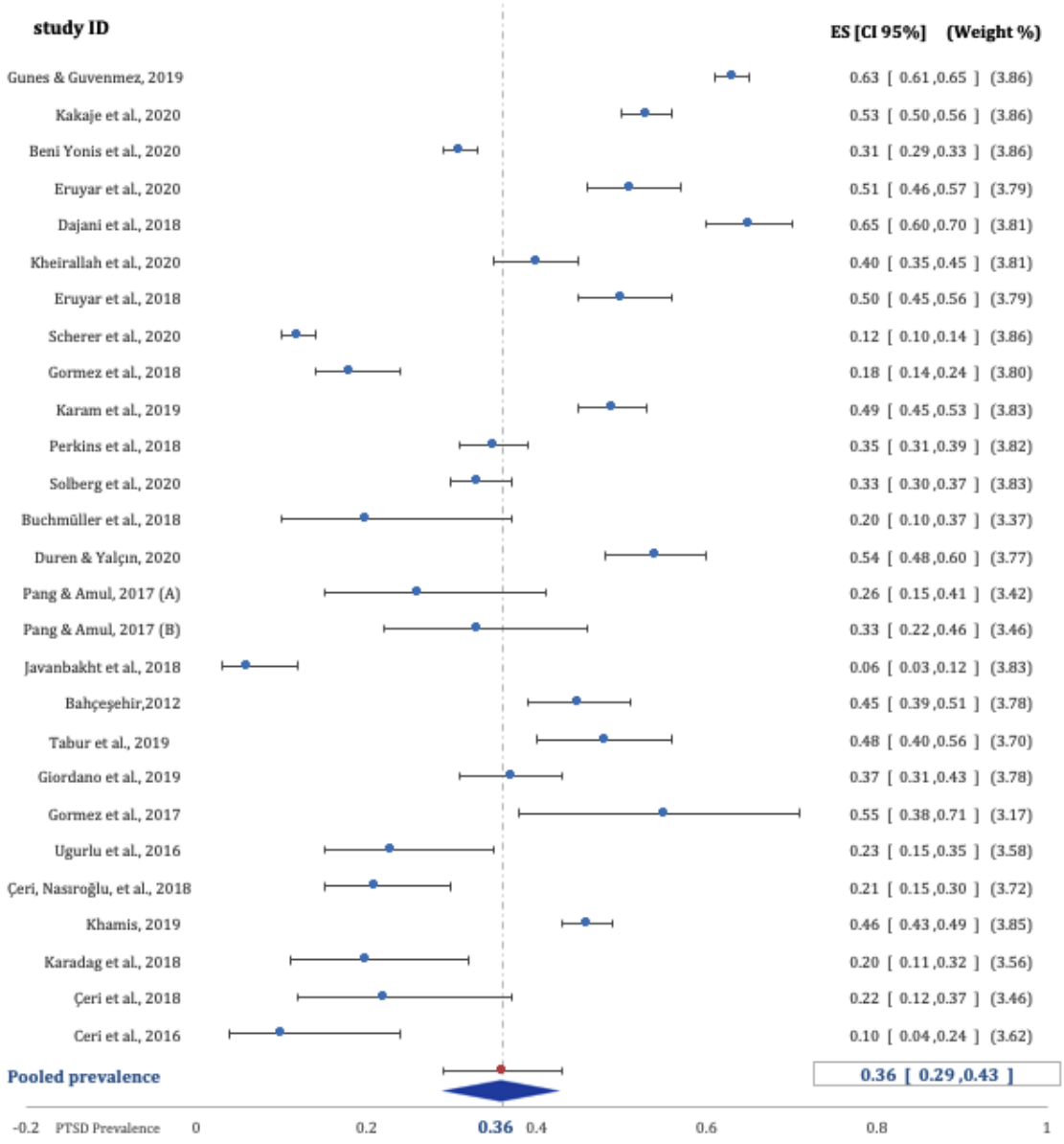

Figure 2: Forest plot with meta-analysis results.

Table 1: Summary of the data extracted from the included studies.

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
(Ceri et al., 2016)	10.5% (38)	2-18 yo M = 12 Females: 57.9% Males: 41%	Turkey, refugees, refugees' camps, they were assessed upon arrival to the camps.	Clinical psychiatric interview according to DSM-5	The killing of one parent by ISIS. Witnessing homicide or a violent situation. Seeing ISIS violence through social media including beheading and bombardment. Witnessing parents leaving their dead children behind. Forced separation of first-degree relatives. Incapacity to contact relatives. Walking long distances with hunger, thirst, and sleep deprivation. Feeling insecure in the camps.	Risk factors: Seeing dead or injured people
(Serap Özer, 2016)	45% (288)	9-18 yo Females: 64.2% Males: 35.8%	Turkey, refugees, camp tents, 6 months (average duration of stay)	Self-report questionnaire: CRIES-8	Witnessing threatening life events, abasement, forced separation from family, violence, and medical problems. Loss of a family member or someone they care about.	Not identified.
(Ugurlu et al., 2016)	23.4% (63)	7-12 yo M = 9.16 SD = 1.7 Females: 46.0%	Turkey, refugees, 30.2% six months, 46% a year and 12.7% more than one year.	Self-report questionnaire:UCLA Post-Traumatic Stress Disorder (UCLA PTSD) INDEX for	War or military experiences, death of someone close, experiencing or	Not identified.

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
		Males: 54.0%		DSM-IV (parent version)	witnessing a dangerous event.	
(Gormez et al., 2017)	54.8% (32)	10-15 yo M = 12.41 SD = 1.68 Females: 40% Males: 60%	Turkey, refugees, length of stay (months): <12: 40% 12–24: 45% >24: 15%	Self-report questionnaire: Child Post-traumatic Stress – Reaction Index (CPTS-RI)	Death of someone close, separation from beloved ones, experienced torture, or cruelty, witnessing wounded or dead.	Not identified.
(Pang & Amul, 2017)	A:26% (42) B:33% (54)	A: 0-6 yo B: 7-14 yo Females: 46% Males: 54%	Germany, refugees, reception camp. mean duration 11·8 months (ranging from 1 day to 32 months)	Self-report questionnaire: A: the post-traumatic stress disorder semi-structured interview (PTSDSSI) 2 B: Kinder-DIPS.3	Family separation during the flight, hunger and thirst. Conflict experiences, personal danger, and loss of their home.	Not identified.
(Javanbakht et al., 2018)	6.3% (131)	6-17 yo M = 11.02 SD = 3.32 Females: 40.5% Males: 59.5%	USA, refugees, participants were away from the conflict area for about 2 years, but the study was conducted within the first month of their arrival	Self-report questionnaire: The UCLA Post-traumatic Stress Reaction Index for the DSM-5	Not identified.	Not identified.
(Buchmüller et al., 2018)	20% (31)	1.5-5 yo M = 2.9 SD = 1.3 Females: 56% Males: 44%	Germany, refugees, 18.4 months of stay (SD=9.7)	Self-report questionnaire: The Child Behavior Checklist (CBCL 1.5–5)	Not identified.	Not identified.

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
(Çeri, Nasıroğlu, et al., 2018)	21.4% (117)	7-17 yo Females: 48.7% Males: 60%	Turkey, refugees, 2 to 60 months residency in Turkey (months) (M=27.7, SD=11.98)	Self-report questionnaire: survey standardized, semi-structured interview-based on DSM-5 diagnostic criteria	Not identified.	Risk factors: witnessing violence against someone, seeing dead bodies, clashes/blasts, and the number of experienced traumatic. No association: gender.
(Çeri, Beşer, et al., 2018)	22.% (41)	1.25 -17 yo M = 9.4 SD = 4 Females: 30.3% Males: 69.7%	Turkey, refugees, 30.2 months after resettlement (SD=15).	Clinical psychiatric interview according to DSM-5	Witnessing armed conflict clashes, death, or injury of someone close. Peer bullying exposure.	Risk factors: witnessing the death or injury of someone.
(Dajani et al., 2018)	65.2% (411)	11-18 yo Females: 53.5% Males: 46.5%	Jordan, refugees, urban centers, duration of stay over 3 years.	Self-report questionnaire: CRIES-8	Witnessing bombardment or explosions, having their home forcibly searched by police or a militia, witnessing the demolition of their home by police or a militia, seeing a wounded or dead body. Living in a refugee camp.	Not identified.
(Eruyar et al., 2018)	50.2% (322)	9-15 yo M = 11.99 SD = 1.82 Females: 51.4 % Males: 48.6%	Turkey, refugees, the average duration of stay is 2.09 years, range 0 months–6 years, SD 1.01.	Self-report questionnaire: UCLA PTSD Reaction Index/DSM Version IV—CPTS-RI	Conflict-related trauma events, direct or indirect thread, and loss of someone they care about.	Risk factor: exposure to traumatic events. No association: age, gender, and parental psychopathology.

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
(Gormez et al., 2018)	18.3% (218)	9-15 yo M = 11.99 SD = 1.82 Females: 51.4% Males: 48.6%	Turkey, refugees, the average duration of stay is 6.86 years, SD= 10.70 months.	Self-report questionnaire: UCLA PTSD Reaction Index/DSM Version IV—CPTS-RI	Witnessing explosions or gun battles, and people being, wounded, killed, or tortured.	Risk factors: death of an important person, male. No association: age, seeing wounded or dead bodies, witnessing violence or killing, being left without food or shelter, satisfaction with living conditions, speaking the host country language.
(Karadag et al., 2018)	19.6% (51)	3-17 yo M = 9.2 SD = 4.36 Females: 29.4% Males: 70.6%	Turkey, refugees. 49% of the patients were living in refugee camps, while 51% were living outside camps, duration of stay is not available.	Clinical psychiatric interview diagnosis according to DSM-5	Loss of a parent due to the conflict.	Not identified.
(Perkins et al., 2018)	35.1% (492)	8-15 yo Females: 51% Males: 49%	Syria (Damascus, and Latakia cities), 50.2% internally displaced, duration of stay is not available.	Self-report questionnaire: CRIES-8	Displacement, conflict-related experiences (heard shelling, saw destruction, explosions, terrorism, violence, fighting, dead bodies, injured people, terrorism, death, and poverty.	Risk factors: living in Damascus (Syria) compared to Latakia (Syria), depression and anxiety symptoms, female, internal displacement. No association: age, death, violence, family size, or social indicator.
(Giordano et al., 2019)	37% (271)	6-14 yo M = 10 SD = 2.11 Females: 41%	Italy, state of indefinite transit, asylum-seeking children, in reception centers,	Self-report questionnaire: Post-Traumatic Stress Reaction Checklist – Child Version – PCL	Death of someone close, directly exposed to military action, extreme deprivation, interpersonal violation, and few reported	Risk factors: extreme deprivation, family torture, and bereavement. No association: age, gender, victim of violence, involvement in

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
		Males: 59%	The average time of families' permanence in centers was between 3 and 6 days, 40% have been traveling for 1 year, 38% 1-2 years, and 22% more than 2 years.		involvements in military actions. Torture within the family and bereavement.	the hostilities, and conflict exposure, resilience.
(Gunes & Guvenmez, 2020)	63.1% (1518)	8-16 yo M = 12.4 SD = 3.1 Females: 53.1% Males: 46.9%	Turkey, refugees, duration of stay is not available.	Self-report questionnaire: Children's Revised Impact of Event Scale-13 (CRIES-13)	Natural disasters, human violence, accidents, sexual abuse	Risk factor: Conflict-related events exposure.
(Karam et al., 2019)	49.3% (549)	7-17 yo M = 11 SD = 1.6 Females: 54.8% Males: 45.2%	Lebanon, refugees, about two-thirds had been in Lebanon for 5 years or less (161 children) at the time of the study and thus were more recent refugees and 81 had been in Lebanon for more than 5 years.	Self-report questionnaire: PTSD Reaction Index (PTSD-RI) for DSM-IV – UCLA	Witnessing violence (bombardment, abuse, witnessing death, injury, or kidnapping of someone), displacement Childhood adversities events; neglect, abuse, or violence by someone or a member in the family.	Risk factor: increased sensitivity (ease of excitation to be unpleasant and overwhelmed), in low and middle conflict exposure levels. No association: gender, sensitivity in high conflict exposure levels.
(Khamis, 2019)	45.6% (1000)	7-18 yo M = 11.30 SD = 2.65 Females: 53.9% Males: 46.1%	Lebanon and Jordan, refugees, duration of stay in months 48-64, SD = 15.58	Clinical psychiatric interview according to the DSM-4.	Conflict atrocities	Risk factors: coping using social withdrawal, self-criticism, and resignation. Protective factors: longer time in the host country, host country (Jordan protective comparing to Lebanon), coping styles (use social support and cognitive

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
						restructuring), family expressiveness. No association: school environment, age, and gender.
(Tabur et al., 2019)	48.1% (156)	M = 8.8 SD = 1.3 Females: 46.8% Males: 53.2%	Turkey, refugees and asylum seekers half of the families resided county center and the rest were living in villages, most lived in ramshackle buildings, duration of stay is not available.	Self-report questionnaire: Post-traumatic Reactions Index for Children (PTRI-C).	Witnessing explosions, gunshots, damage to the house, injuries of extended family/ relatives, being injured themselves, and death of acquaintances.	Risk factors: female, loss of a family member/acquaintances in the conflict, and social withdrawal.
(Beni Yonis et al., 2020)	31% (1773)	12-18 yo M = 14.5 SD = 1.5 Females: 56.1% Males: 43.9%	Jordan, refugees, in main cities, duration of stay was superior to 2 years (2-3 years for 21%, 3–4 years for 33% and 4–6 years for the remaining sample).	Self-report questionnaire: Child Post-traumatic Stress Disorder Symptom Scale (CPSS)	Not identified	Risk factors: female, death of one or both parents. No association: parents' level of education, total family income, family size and housing status.
(Duren & Yalçın, 2020)	53.7% (268)	12-18 yo M=13.86 SD=1.67 Females: 50.8% Males: 49.2%	Turkey, refugees, duration of stay is not available.	Self-report questionnaire: CRIES-8.	Not identified.	Protective factor: social trust. No association: age, gender.

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
(Eruyar et al., 2020)	51.4% (322)	8-17 yo M = 11.6 SD = 1.81 Females: 51% Males: 49%	Turkey, refuge, duration of stay is not available.	Self-report questionnaire: CRIES-8	Not identified	Risk factors: Low scores of perceived maternal/paternal attachments. No association: Age, gender, perceived parenting styles (emotionally warm, rejecting, and over-protective)
(Kakaje et al., 2020)	53% (1369)	M = 16.38 SD = 0.79 Females: 47.2% Males: 52.8%	Syria (Damascus), citizens: 52.2% internally displaced, urban placement duration not available.	Self-report questionnaire: CRIES-13	Conflict-related (directly endangered, noises, death of someone close), displacement	Risk factors: female Protective factors: social support, employment No association: consanguinity, chronic medical condition, type of employment, or socioeconomic status
(Kheirallah et al., 2020)	40% (418)	M = 14.9 SD = 1.3 Females: 55% Males: 45%	Jordan, refugees, duration of stay average 1.8 years (SD=0.8).	Self-report questionnaire: PTSD Checklist – Civilian Version (PCL-C)	Conflict-related traumas, injury, or loss of a member of the family	Risk factors: male.
(Scherer et al., 2020)	11.5% (852)	8–17 yo M = 11.9 SD = 0.2 Females: 51% Males: 49%	Turkey, refugees, the majority of children lived in a flat/apartment (81%) or house (16%), duration of displacement ~4 years.	Self-report questionnaire: CRIES-8	Not identified.	Risk factors: females, older children (14-17 years old) compared to younger age (8-10 years old) Protective factor: living in a household with 8 or more households.

Study	PTSD prevalence (sample size)	Age Gender	Country of stay, visa status, duration of stay	PTSD assessment method and tool	Trauma events	Factors* (risk, protective, no association)
						No association: resilience scores.
(Solberg et al., 2020)	33.4% (574)	16-18 yo Females: 53% Males: 47%	Sweden, refugees, living with mother and/or father or relatives family home or unrelated adults, or governmentally supported home, duration of stay is not available.	Self-report questionnaire: CRIES-8	Not identified.	No association: gender, migratory accompany.

Note: Yo: years-old, M: mean, SD: Standard deviation; * Protective or risk influencing factors were considered statistically significant when p-value was lower than 0.05 in the pooled studies ($p<0.05$). When the associations weren't statistically significant, the factors were categorized as "no association".

5. DISCUSSION

This systematic review showed that 6.3% to 65.3% of Syrian children and adolescents exposed to the 2011 Syrian conflict were affected by PTSD, with a pooled estimate of 36%. Besides the several trauma events related to the conflict itself, as the loss of an important family member and witnessing violence, the displacement, especially being internally displaced, and economic and social deprivation, social withdrawal, and low parental/maternal attachment were identified as risk factors, while social trust and social support were protective factors.

Our estimates of prevalence, pooled from these 26 studies on PTSD in children and adolescents exposed to the Syrian conflict, are higher than those estimated by Alisic et al (Alisic et al., 2014), of 15.9% among children and adolescents exposed to traumatic events, or from Blackmore et al (Blackmore et al., 2020), with an estimated prevalence of 22.71%. These estimates of the prevalence of PTSD among Syrian children and adolescents exposed to the conflict were also higher than estimates among Lebanese peers after conflict, of 8.5 to 32.5% (Shaar, 2013) but close to the prevalence among Palestinian children, of 34.1%.(Khamis, 2005) This may be due to the extreme levels of violence and the continuous state of these conflicts, with high proportions of areas affected, in Syria and Palestine.

The high prevalence of PTSD among Syrian children and adolescents can be explained by the traumatic experiences that they were exposed to, which included conflict-related trauma, extreme deprivation, and displacement. The studies here-analyzed reported traumatic conflict-related events like the death of one or both parents, the loss of a family member, or a close person.(Beni Yonis et al., 2020; Gormez et al., 2018; Tabur et al., 2019) The loss of a parent or a beloved person is one of the most stressful events that a child can experience, increasing the short- and long-term risk of mental health disorders, including PTSD.(Boelen et al., 2017; Luecken & Roubinov, 2012) Indeed, Boelen and Spuij (Boelen & Spuij, 2013) reported that, among bereaved, more than half (51.5%) of children and adolescents that suffered the loss of a loved one had PTSD. Alongside witnessing death, seeing a corpse, and/or injury of

someone,(Çeri, Beşer, et al., 2018; Ceri et al., 2016; Çeri, Nasıroğlu, et al., 2018) witnessing violence, clashes, and blasts, experiencing extreme deprivation, internal and external displacement experience, or family abuse were factors that increased the risk of PTSD.(Çeri, Nasıroğlu, et al., 2018; Eruyar et al., 2018; Giordano et al., 2019; Gunes & Guvenmez, 2020; Perkins et al., 2018)

Regarding the factors that can aggravate or alleviate the risk of PTSD among these populations, the role of age seems inconsistent as most studies found no association and one study found that older age was a risk factor (Scherer et al., 2020). Though, the small age span analyzed in these studies may have limited the capacity to discern the effect of age on the risk of PTSD and further studies with wider age groups can contribute to better understand the effect of age, analyzing the differences between smaller children, adolescents, and adults.

As of gender, the literature suggests that female gender could be a risk factor for PTSD in children,(Garza & Jovanovic, 2017) which was not clearly observed in this systematic review, as eight studies did not find any association of female gender with PTSD (Çeri, Nasıroğlu, et al., 2018; Duren & Yalçın, 2020; Eruyar et al., 2018, 2020; Giordano et al., 2019; Karam et al., 2019; Khamis, 2005; Solberg et al., 2020), five studies found it to be a risk factor ((Beni Yonis et al., 2020; Kakaje et al., 2021; Perkins et al., 2018; Scherer et al., 2020; Tabur et al., 2019)) and in two other studies showing female gender as a protective (Gormez et al., 2018; Kheirallah et al., 2020). These mixed results may be due to several factors: (1) the conflict-affected civilians, from all genders, and not merely military groups (usually constituted by males), (2) in the Syrian community females generally are more protected and less exposed to the external environments whereas males are expected to take some of the adults' responsibilities, (Kheirallah et al., 2020) and (3) differences in how male and female children and adolescents experienced the conflict may vary according to cultural, ethnic and socioeconomic groups, and between geographic areas.

Living in Damascus city was a risk factor comparing to living in Latakia, both in Syria (Perkins et al., 2018), and living in Jordan was a protective factor comparing to living in Lebanon.(Khamis, 2019) Longer stay in the host country was associated with lower PTSD rates.(Khamis, 2019) Participants hosted in these lower-income countries presented higher PTSD rates than those who settled in high-income countries such as northern European countries and the USA. This could indicate that more deprived contexts can contribute to higher PTSD rates among children's refugees, which is consistent with the literature review which shows considerably higher estimates of PTSD among children and adolescents living in low-and middle-income countries than in high-income countries.(Yatham et al., 2018) Less deprived contexts may have better social, educational, and health infrastructures, as well as better employment and living conditions, which may contribute to higher protection against PTSD and support people's recovery.

From those studies included in our systematic review, only one assessed the effect of the housing status in accommodation settings in PTSD prevalence, with no statistically significant association(Beni Yonis et al., 2020) The length of stay in camps was a significant predictor for the presence of PTSD among Syrian Kurdish refugees in the Kurdistan region of Iraq.(Mahmood et al., 2019).

Social support and social trust seem to have a protective influence on PTSD rates, as well as higher family attachment levels, (Duren & Yalçın, 2020; Kakaje et al., 2021) while social withdrawal was a risk factor. (Khamis, 2005; Tabur et al., 2019) These results are in line with the extensive narrative of the literature collected by Charuvastra et al (2008) (Charuvastra & Cloitre, 2008), which shows the importance of social bonds for the maintenance of mental health and/or recovery from PTSD. Family size did not show a significant influence in most of the studies. Although larger families usually indicate stronger social support, (Beni Yonis et al., 2020; Perkins et al., 2018) this influence can be contradicted by the fact that large family sizes can be at higher risk of poverty.(The World Bank, 2021)

The literature shows an association between low socioeconomic status and PTSD among conflict-affected populations.(Bogic et al., 2015; Chen et al., 2017) Porter & Haslam's (Porter & Haslam, 2005) meta-analysis points to a linear relationship between refugees' mental health and their socioeconomic status, including access to employment. From the studies here-analyzed, one indicated that employment for children and adolescents in summers and holidays had a protective factor (Kakaje et al., 2020), but other socioeconomic factors such as family income, housing do not seem to have a significant influence on PTSD prevalence (Beni Yonis et al., 2020; Kakaje et al., 2020) This difference between what the literature reports and what was assessed in the pooled studies may be due to some factors: first, the conflict has been experienced by most socioeconomic strata and, second, Syrian refugees in the Middle East are living under the poverty line, which may diminish the differentiation between higher and lower incomes.(The World Bank, 2021) Moreover, there is a big gap between the living standards and expenses between Syria and many of the surrounding host countries such as Lebanon and Jordan in where these findings were reported, and as well as with other countries where many of socioeconomic status questionnaires are validated, in addition to the fact that responses to questions about parents' income may have important response bias, as these questions are not comfortable in the Syrian culture. (Kakaje et al., 2020).

5.1. Limitations

This study's results must be interpreted taking into account the following limitations. First, despite the prevalence of PTSD has been studied by several studies, fewer assessed its determinants – namely family, living conditions, socioeconomic, cultural, and political context – which may limit the identification of some contextual determinants of PTSD by this systematic review.

Second, most pooled studies (n= 15/26) selected participants from schools. We admit this it represents a more accessible way to collect data, but as there is a considerable drop in school percentage among refugee and Syrian children - according to The World Bank, more than half of school-age children

in Jordan and Lebanon (The World Bank, 2021) - existing studies may be leaving outside an important category of this population who do not have access to schools. This vulnerable population may be undocumented, not having access to education, living in poor conditions, and working illegally. These children and adolescents are at further risk of PTSD, as many are exposed to violence in the living settings (or in the street), in the work context may be exposed to multiple forms of abuse including sexual abuse (UNICEF, 2017; UNICEF Middle East and North Africa, 2015; UNICEF USA, 2017).

Third, the literature describing this public health problem in Syria covered only two large cities (Damascus and Latakia), whereas data from other regions still exposed to ongoing conflict, severe social and economic deprivation, and, nowadays, to the COVID-19 pandemic effects, remain absent.(Kakaje et al., 2020; Perkins et al., 2018)

Fourth, the majority of pooled studies (n=22/26) used self-report questionnaires as an assessment tool. However, the reliance on self-report questionnaires with cut-off scores to determine PTSD diagnoses might not be validated for the population here studied. (Blackmore et al., 2020; Kakaje et al., 2020; Khamis, 2005) Literal translation to the participants' native language is not enough, adaptation is needed to meet the cultural background of the participants. Moreover, the association of PTSD with other different mental disorders among Syrian children was not done in most studies. The assessment of other mental health problems that probably occur in these populations, as anxiety and depression disorders, is needed to better understand PTSD and its interaction with other mental illnesses.

Fifth, only cross-sectional studies were found in our search, which does not allow us to assess the evolution of PTSD in these groups nor the impact of some determinants in its aggravation or mitigation. As such, though for some variables causation is very likely (as for exposure to violence and PTSD), we cannot consider causation but the only correlation between these factors and the outcome.

Sixth, our meta-analysis included two different assessment methods - self-report questionnaires and clinical psychiatric interview diagnoses. Despite being different in nature, these results did not largely differ.

6. CONCLUSION

This study showed that PTSD is highly prevalent among Syrian children and adolescents exposed to the 2011 conflict, with a higher estimate than those found in other studies with children and adolescents exposed to traumatic events. This increased risk may not only be a result of exposure to the conflict itself but also be influenced by the indirect consequences of the conflict other determinants, as the death of an important family member or an important person, witnessing conflict-related traumatic events such as clashes and violence, extreme deprivation, and social withdrawal.

This knowledge emphasizes the urgent mental health needs of conflict-affected populations, particularly children and adolescents, and encourages international policymakers to ensure that conflict-affected populations, especially children and adolescents that were exposed to the Syrian conflict, have supportive and safe recovery environments.

7. CONFLICT OF INTREST:

None.

8. References

Alisic, E., Zalta, A. K., van Wesel, F., Larsen, S. E., Hafstad, G. S., Hassanpour, K., & Smid, G. E. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: meta-analysis. *British Journal of Psychiatry*, *204*(5). https://doi.org/10.1192/bjp.bp.113.131227

Altare, C., Kahi, V., Ngwa, M., Goldsmith, A., Hering, H., Burton, A., & Spiegel, P. (2019). Infectious disease epidemics in refugee camps: a retrospective analysis of UNHCR data (2009-2017). *Journal of Global Health Reports*, *3*. https://doi.org/10.29392/joghr.3.e2019064

Attanayake, V., McKay, R., Joffres, M., Singh, S., Burkle, F., & Mills, E. (2009). Prevalence of mental disorders among children exposed to war: a systematic review of 7,920 children. In *Medicine, conflict, and survival* (Vol. 25, Issue 1, pp. 4–19). https://doi.org/10.1080/13623690802568913

Beni Yonis, O., Khader, Y., Jarboua, A., Al-Bsoul, M. M., Al-Akour, N., Alfaqih, M. A., Khatatbeh, M. M., & Amarneh, B. (2020). Post-traumatic stress disorder among Syrian adolescent refugees in Jordan. *Journal of Public Health (Oxford, England)*, *42*(2), 319–324. https://doi.org/10.1093/pubmed/fdz026

Bizri, A. R., Fares, J., & Musharrafieh, U. (2018). Infectious diseases in the era of refugees: Hepatitis A outbreak in Lebanon. *Avicenna Journal of Medicine*, *8*(04). https://doi.org/10.4103/ajm.AJM_130_18

Blackmore, R., Gray, K. M., Boyle, J. A., Fazel, M., Ranasinha, S., Fitzgerald, G., Misso, M., & Gibson-Helm, M. (2020). Systematic Review and Meta-analysis: The Prevalence of Mental Illness in Child and Adolescent Refugees and Asylum Seekers. In *Journal of the American Academy of Child and Adolescent Psychiatry* (Vol. 59, Issue 6, pp. 705–714). Elsevier Inc. https://doi.org/10.1016/j.jaac.2019.11.011

Boelen, P. A., & Spuij, M. (2013). Symptoms of Post-Traumatic Stress Disorder in Bereaved Children and Adolescents: Factor Structure and Correlates. *Journal of Abnormal Child Psychology*, *41*(7). https://doi.org/10.1007/s10802-013-9748-6

Boelen, P. A., Spuij, M., & Reijntjes, A. H. A. (2017). Prolonged grief and posttraumatic stress in bereaved children: A latent class analysis. *Psychiatry Research*, *258*. https://doi.org/10.1016/j.psychres.2017.09.002

Bogic, M., Njoku, A., & Priebe, S. (2015a). Long-term mental health of war-refugees: a systematic literature review. *BMC International Health and Human Rights*, *15*(1). https://doi.org/10.1186/s12914-015-0064-9

Bogic, M., Njoku, A., & Priebe, S. (2015b). Long-term mental health of war-refugees: a systematic literature review. *BMC International Health and Human Rights*, *15*(1). https://doi.org/10.1186/s12914-015-0064-9

Buchmüller, T., Lembcke, H., Busch, J., Kumsta, R., & Leyendecker, B. (2018). Exploring mental health status and syndrome patterns among young refugee children in Germany. *Frontiers in Psychiatry*, *9*(MAY). https://doi.org/10.3389/fpsyt.2018.00212

Buvinic, M., das Gupta, M., Casabonne, U., & Verwimp, P. (2013). Violent Conflict and Gender Inequality: An Overview. *The World Bank Research Observer*, *28*(1). https://doi.org/10.1093/wbro/lks011

Carlton-Ford, S., & Boop, D. (2010). Civil War and Life Chances. *International Sociology*, *25*(1). https://doi.org/10.1177/0268580909346707

Çeri, V., Beşer, C., Fiş, N. P., & Arman, A. (2018). Findings from a specialized child psychiatry unit for care of refugee children in Istanbul. *Klinik Psikiyatri Dergisi*, *21*(2), 113–121. https://doi.org/10.5505/kpd.2018.57070

Çeri, V., Nasıroğlu, S., Ceri, M., & Çetin, F. Ç. (2018). Psychiatric Morbidity Among a School Sample of Syrian Refugee Children in Turkey: A Cross-Sectional, Semistructured, Standardized Interview-Based Study. In *Journal of the American Academy of Child and Adolescent Psychiatry* (Vol. 57, Issue 9, pp. 696-698.e2). Elsevier Inc. https://doi.org/10.1016/j.jaac.2018.05.019

Ceri, V., Özlü-Erkilic, Z., Özer, Ü., Yalcin, M., Popow, C., & Akkaya-Kalayci, T. (2016). Psychiatric symptoms and disorders among Yazidi children and adolescents immediately after forced migration following ISIS attacks. *Neuropsychiatrie*, *30*(3), 145–150. https://doi.org/10.1007/s40211-016-0195-9

Charuvastra, A., & Cloitre, M. (2008). Social Bonds and Posttraumatic Stress Disorder. *Annual Review of Psychology*, *59*(1). https://doi.org/10.1146/annurev.psych.58.110405.085650

Chen, W., Hall, B. J., Ling, L., & Renzaho, A. M. (2017). Pre-migration and post-migration factors associated with mental health in humanitarian migrants in Australia and the moderation effect of post-migration stressors: findings from the first wave data of the BNLA cohort study. *The Lancet Psychiatry*, *4*(3). https://doi.org/10.1016/S2215-0366(17)30032-9

Cheung, F., Kube, A., Tay, L., Diener, E., Jackson, J. J., Lucas, R. E., Ni, M. Y., & Leung, G. M. (2020). The impact of the Syrian conflict on population well-being. *Nature Communications*, *11*(1). https://doi.org/10.1038/s41467-020-17369-0

Christopher JL Murray, G. K. A. D. L. N. T. and E. Krug. (2002). *Armed Conflict as a Public Health Problem*. 346–349. https://j.mp/2oThkHL

Dajani, R., Hadfield, K., van Uum, S., Greff, M., & Panter-Brick, C. (2018). Hair cortisol concentrations in war-affected adolescents: A prospective intervention trial. *Psychoneuroendocrinology*, *89*. https://doi.org/10.1016/j.psyneuen.2017.12.012

Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*, *29*(1). https://doi.org/10.1016/j.joep.2007.09.001

Duren, R., & Yalçın, Ö. (2020). Social capital and mental health problems among Syrian refugee adolescents: The mediating roles of perceived social support and post-traumatic symptoms. *International Journal of Social Psychiatry*. https://doi.org/10.1177/0020764020945355

Eruyar, S., Maltby, J., & Vostanis, P. (2018). Mental health problems of Syrian refugee children: the role of parental factors. *European Child and Adolescent Psychiatry*, *27*(4), 401–409. https://doi.org/10.1007/s00787-017-1101-0

Eruyar, S., Maltby, J., & Vostanis, P. (2020). How do Syrian refugee children in Turkey perceive relational factors in the context of their mental health? *Clinical Child Psychology and Psychiatry*, *25*(1), 260–272. https://doi.org/10.1177/1359104519882758

Fazel, M. (2002). The mental health of refugee children. *Archives of Disease in Childhood*, *87*(5). https://doi.org/10.1136/adc.87.5.366
Fricchione, G. L. (2018). The Challenge of Stress-Related Non-Communicable Diseases. *Medical Science Monitor Basic Research*, *24*. https://doi.org/10.12659/MSMBR.911473
Garry, S., & Checchi, F. (2020). Armed conflict and public health: into the 21st century. *Journal of Public Health*, *42*(3). https://doi.org/10.1093/pubmed/fdz095
Garza, K., & Jovanovic, T. (2017). Impact of Gender on Child and Adolescent PTSD. *Current Psychiatry Reports*, *19*(11). https://doi.org/10.1007/s11920-017-0830-6
Gayer, M., Legros, D., Formenty, P., & Connolly, M. A. (2007). Conflict and Emerging Infectious Diseases. *Emerging Infectious Diseases*, *13*(11). https://doi.org/10.3201/eid1311.061093
Geneva Declaration Secretariat. (2008). *Global Burden of Armed Violence*.
Ghobarah, H. A., Huth, P., & Russett, B. (2004). Comparative Public Health: The Political Economy of Human Misery and Well-Being. *International Studies Quarterly*, *48*(1). https://doi.org/10.1111/j.0020-8833.2004.00292.x
Ghobarah Hazem, H. P. R. B. (2003). *Civil Wars Kill and Maim People—Long after the Shooting Stops*. https://www.files.ethz.ch/isn/30358/2002-10.pdf
Giordano, F., Cipolla, A., Ragnoli, F., & Brajda Bruno, F. (2019). Transit Migration and Trauma: the Detrimental Effect of Interpersonal Trauma on Syrian Children in Transit in Italy. *Psychological Injury and Law*, *12*(1), 76–87. https://doi.org/10.1007/s12207-019-09345-x
Gordon S, B. A. D. A. G. P. (2010). Study exploring the evidence relating Health and Conflict interventions and outcomes. *UK Cross Government Group on Health and Conflict*. https://archive.lstmed.ac.uk/8842/
Gormez, V., Kılıç, H. N., Orengul, A. C., Demir, M. N., Demirlikan, Ş., Demirbaş, S., Babacan, B., Kınık, K., & Semerci, B. (2018). Psychopathology and Associated Risk Factors Among Forcibly Displaced Syrian Children and Adolescents. *Journal of Immigrant and Minority Health*, *20*(3), 529–535. https://doi.org/10.1007/s10903-017-0680-7
Gormez, V., Kılıç, H. N., Orengul, A. C., Demir, M. N., Mert, E. B., Makhlouta, B., Kınık, K., & Semerci, B. (2017). Evaluation of a school-based, teacher-delivered psychological intervention group program for trauma-affected Syrian refugee children in Istanbul, Turkey. *Psychiatry and Clinical Psychopharmacology*, *27*(2), 125–131. https://doi.org/10.1080/24750573.2017.1304748
Guha-Sapir, D. and W. G. van P. (2002). Armed conflict and public health: a report on knowledge and knowledge gaps. In *UCL-Université Catholique de Louvain. Brussels: CRED*. https://dial.uclouvain.be/downloader/downloader.php?pid=boreal:179723&datastream=PDF_01
Guha-Sapir, D., & Panhuis, W. G. (2004). Conflict-related Mortality: An Analysis of 37 Datasets. *Disasters*, *28*(4). https://doi.org/10.1111/j.0361-3666.2004.00267.x
Gunes, S., & Guvenmez, O. (2020). Psychiatric symptoms in traumatized Syrian refugee children settled in Hatay. *Nordic Journal of Psychiatry*, *74*(4), 307–310. https://doi.org/10.1080/08039488.2019.1707282

Hassan, G., Ventevogel, P., Jefee-Bahloul, H., Barkil-Oteo, A., & Kirmayer, L. J. (2016). Mental health and psychosocial wellbeing of Syrians affected by armed conflict. *Epidemiology and Psychiatric Sciences*, *25*(2). https://doi.org/10.1017/S2045796016000044

Håvard Strand, S. A. R. H. H. H. M. N. (2020). *Trends in Armed Conflict, 1946–2019*. The Peace Research Institute Oslo. https://www.prio.org/utility/DownloadFile.ashx?id=2193&type=publicationfile

Hedar, M. (2017). Mental health during the Syrian crisis: How Syrians are dealing with the psychological effects. *International Review of the Red Cross*, *99*(906). https://doi.org/10.1017/S1816383119000080

ICRC Opinion paper. (2008). *How is the Term "Armed Conflict" Defined in International Humanitarian Law?* 1-undefined.

International Rescue Committee. (2021). *A decade of destruction: attacks on health care in Syria*. https://www.rescue.org/article/decade-destruction-attacks-health-care-syria

Javanbakht, A., Rosenberg, D., Haddad, L., & Arfken, C. L. (2018). Mental Health in Syrian Refugee Children Resettling in the United States: War Trauma, Migration, and the Role of Parental Stress. In *Journal of the American Academy of Child and Adolescent Psychiatry* (Vol. 57, Issue 3, pp. 209-211.e2). Elsevier Inc. https://doi.org/10.1016/j.jaac.2018.01.013

Kakaje, A., al Zohbi, R., Hosam Aldeen, O., Makki, L., Alyousbashi, A., & Alhaffar, M. B. A. (2021). Mental disorder and PTSD in Syria during wartime: a nationwide crisis. *BMC Psychiatry*, *21*(1). https://doi.org/10.1186/s12888-020-03002-3

Kakaje, A., Zohbi, R. al, Alyousbashi, A., Abdelwahed, R., Aldeen, O. H., Alhalabi, M. M., Ghareeb, A., & Latifeh, Y. (2020). *Posttraumatic stress disorder (PTSD), anger and Mental health of school students in Syria after ten years of conflict: a large scale school-based study*. https://doi.org/10.21203/rs.3.rs-27218/v1

Kar, N. (2009). Psychological impact of disasters on children: Review of assessment and interventions. In *World Journal of Pediatrics* (Vol. 5, Issue 1, pp. 5–11). https://doi.org/10.1007/s12519-009-0001-x

Karadag, M., Gokcen, C., Dandil, F., & Calisgan, B. (2018). Our experience with Syrian refugee patients at the child and adolescent psychiatry clinic in Gaziantep, Turkey. *International Journal of Psychiatry in Clinical Practice*, *22*(2), 157–159. https://doi.org/10.1080/13651501.2017.1387269

Karam, E. G., Fayyad, J. A., Farhat, C., Pluess, M., Haddad, Y. C., Tabet, C. C., Farah, L., & Kessler, R. C. (2019). Role of childhood adversities and environmental sensitivity in the development of post-traumatic stress disorder in war-exposed Syrian refugee children and adolescents. *British Journal of Psychiatry*, *214*(6), 354–360. https://doi.org/10.1192/bjp.2018.272

Khamis, V. (2005). Post-traumatic stress disorder among school age Palestinian children. *Child Abuse & Neglect*, *29*(1). https://doi.org/10.1016/j.chiabu.2004.06.013

Khamis, V. (2019). Posttraumatic stress disorder and emotion dysregulation among Syrian refugee children and adolescents resettled in Lebanon and Jordan. *Child Abuse and Neglect*, *89*, 29–39. https://doi.org/10.1016/j.chiabu.2018.12.013

Kheirallah, K. A., Cobb, C. O., Alsulaiman, J. W., Alzoubi, A., Hoetger, C., Kliewer, W., & Mzayek, F. (2020). Trauma exposure, mental health and tobacco use among vulnerable Syrian refugee youth in Jordan. *Journal of Public Health (United Kingdom)*, *42*(3), E343–E351. https://doi.org/10.1093/pubmed/fdz128

Killian Thomas, Cardona Betty, & Brottem Lainey J. (2018). Refugee Children Acculturation Group Process in Schools as Cultural Microcosms. *Jounal of School Counselling*.

Kouadio Koffi Isidore. (2011). Eradicating Measles Outbreaks in Refugee Camps. *United Nations University*. https://unu.edu/publications/articles/eradicating-measles-outbreaks-in-refugee-camps.html

Luecken, L. J., & Roubinov, D. S. (2012). Pathways to Lifespan Health Following Childhood Parental Death. *Social and Personality Psychology Compass*, *6*(3). https://doi.org/10.1111/j.1751-9004.2011.00422.x

Mahmood, H. N., Ibrahim, H., Goessmann, K., Ismail, A. A., & Neuner, F. (2019). Post-traumatic stress disorder and depression among Syrian refugees residing in the Kurdistan region of Iraq. *Conflict and Health*, *13*(1). https://doi.org/10.1186/s13031-019-0238-5

Marija Obradovic. (2015). Protecting Female Refugees against Sexual and Gender-based Violence in Camps. *United Nation University*. https://unu.edu/publications/articles/protecting-female-refugees-against-sexual-and-gender-based-violence-in-camps.html

Mental health foundation UK. (2021). *Physical health and mental health*. https://www.mentalhealth.org.uk/a-to-z/p/physical-health-and-mental-health

Mpembi, M. N., Lukeba, T., Mayemba, D., Massamba, V. K., Matonda ma Nzuzi, T., Gokara, S., Vermeiren, E., Lelo, G. M., & Mampunza ma Miezi, S. M. (2018). Etats de stress en consultation externe à l'hôpital général de Bangui dans un contexte de conflit arme: étude transversale descriptive. *Pan African Medical Journal*, *29*. https://doi.org/10.11604/pamj.2018.29.26.7107

Murthy RS, L. R. (2006). Among the consequences of war, the impact on the mental health of the civilian population is one of the most significant. . *World Psychiatry*, 25–30. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1472271/

Narayan, K. M. V., Ali, M. K., & Koplan, J. P. (2010). Global Noncommunicable Diseases — Where Worlds Meet. *New England Journal of Medicine*, *363*(13). https://doi.org/10.1056/NEJMp1002024

National Collaborating Centre for Mental Health (UK). (2005). *Post-Traumatic Stress Disorder: The Management of PTSD in Adults and Children in Primary and Secondary Care*. Leicester (UK): Gaskell.

Nyaga, V. N., Arbyn, M., & Aerts, M. (2014). Metaprop: a Stata command to perform meta-analysis of binomial data. *Archives of Public Health*, *72*(1). https://doi.org/10.1186/2049-3258-72-39

O'hare, B. A. M., & Southall, D. P. (2007). First do no harm: The impact of recent armed conflict on maternal and child health in Sub-Saharan Africa. *Journal of the Royal Society of Medicine*, *100*(12). https://doi.org/10.1177/0141076807100012015

ohn Grundy, B.-A. B. P. A. and S. M. (2008). A CONCEPTUAL FRAMEWORK FOR PUBLIC HEALTH ANALYSIS OF WAR AND DEFENCE POLICY. *International Journal of Peace Studies*, 87–99. https://www.jstor.org/stable/41852978

Pang, T., & Amul, G. G. H. (2017). Next WHO Director-General: hear the angels while fighting the wolves. *The Lancet*, *389*(10072). https://doi.org/10.1016/S0140-6736(17)30388-4

Perkins, J. D., Ajeeb, M., Fadel, L., & Saleh, G. (2018). Mental health in Syrian children with a focus on post-traumatic stress: a cross-sectional study from Syrian schools. *Social Psychiatry and Psychiatric Epidemiology*, *53*(11), 1231–1239. https://doi.org/10.1007/s00127-018-1573-3

Porter, M., & Haslam, N. (2005). Predisplacement and Postdisplacement Factors Associated With Mental Health of Refugees and Internally Displaced Persons. *JAMA*, *294*(5). https://doi.org/10.1001/jama.294.5.602

Scherer, N., Hameed, S., Acarturk, C., Deniz, G., Sheikhani, A., Volkan, S., Örücü, A., Pivato, I., Aklncl, Patterson, A., & Polack, S. (2020). Prevalence of common mental disorders among Syrian refugee children and adolescents in Sultanbeyli district, Istanbul: Results of a population-based survey. *Epidemiology and Psychiatric Sciences*. https://doi.org/10.1017/S2045796020001079

Scott Gates, H. H. H. M. N. H. S. (2010). *Consequences of Civil Conflict.* . https://openknowledge.worldbank.org/bitstream/handle/10986/27502/620270WP0Conse0BOX0361475B00PUBLIC0.pdf?sequence=1&isAllowed=y

Serap Özer, S. R. S. B. O. (2016). *Bahçeşehir Study of Syrian Refugee Children in Turkey*. https://books.google.pt/books/about/Bah%C3%A7e%C5%9Fehir_Study_of_Syrian_Refugee_Chi.html?id=Wxu0AQAACAAJ&redir_esc=y

Shaar, K. H. (2013). Post-traumatic stress disorder in adolescents in Lebanon as wars gained in ferocity: a systematic review. *Journal of Public Health Research*, *2*(2). https://doi.org/10.4081/jphr.2013.e17

Shetty, A. K. (2019). Infectious Diseases among Refugee Children. *Children*, *6*(12). https://doi.org/10.3390/children6120129

Sidel, V. W., & Levy, B. S. (2008). The health impact of war †. *International Journal of Injury Control and Safety Promotion*, *15*(4). https://doi.org/10.1080/17457300802404935

SOHR. (2021). *Total death toll | Over 606,000 people killed across Syria since the beginning of the "Syrian Revolution", including 495,000 documented by SOHR*. https://www.syriahr.com/en/217360/?__cf_chl_jschl_tk__=pmd_64e9b817bd51b3d9268906b682604be158851fc2-1628791211-0-gqNtZGzNAeKjcnBszQii

Solberg, Ø., Nissen, A., Vaez, M., Cauley, P., Eriksson, A. K., & Saboonchi, F. (2020). Children at risk: A nation-wide, cross-sectional study examining post-traumatic stress symptoms in refugee minors from Syria, Iraq and Afghanistan resettled in Sweden between 2014 and 2018. In *Conflict and Health* (Vol. 14, Issue 1). BioMed Central Ltd. https://doi.org/10.1186/s13031-020-00311-y

Stuart Gordon, A. B. A. D. and P. G. (2010). Study exploring the evidence relating Health and Conflict interventions and outcomes. *Y the UK Cross Government Group on Health and Conflict*. https://webarchive.nationalarchives.gov.uk/20111210182747/http://ww

w.stabilisationunit.gov.uk/attachments/article/523/ExploringtheevidencerelatingHealthandConflictinterventionsandoutcome.pdf
Tabur, S., Tufan, A. E., Çeri, V., & Semerci, B. (2019). Syrian Civil War's effects on Turkish school children: prevalence and predictors of psychopathology*. *Psychiatry and Clinical Psychopharmacology*, *29*(4), 811–816. https://doi.org/10.1080/24750573.2019.1661758
Taleb, Z. ben, Bahelah, R., Fouad, F. M., Coutts, A., Wilcox, M., & Maziak, W. (2014). Syria: health in a country undergoing tragic transition. In *International Journal of Public Health* (Vol. 60, Issue 1, pp. 63–72). Birkhauser Verlag AG. https://doi.org/10.1007/s00038-014-0586-2
The World Bank. (2021). *The Welfare of Syrian Refugees: Evidence from Jordan and Lebanon*. https://www.worldbank.org/en/topic/poverty/publication/the-welfare-of-syrian-refugees-evidence-from-jordan-and-lebanon
Trang Thomas, W. L. (2021). Psychological Well Being of Child and Adolescent Refugee and Asylum Seekers: Overview of Major Research Findings of the Past Ten Years. *Australian Human Rights Commission* . https://humanrights.gov.au/our-work/psychological-well-being-child-and-adolescent-refugee-and-asylum-seekers#about
Ugurlu, N., Akca, L., & Acarturk, C. (2016). An art therapy intervention for symptoms of post-traumatic stress, depression and anxiety among Syrian refugee children. *Vulnerable Children and Youth Studies*, *11*(2), 89–102. https://doi.org/10.1080/17450128.2016.1181288
UN. (2016). *United Nations Sustainable developement Goals*. https://unstats.un.org/sdgs/metadata/?Text=&Goal=16&Target=
UN. (2021). *ARMED CONFLICT - Chapter XV* . https://www.un.org/esa/socdev/rwss/docs/2001/15%20Armed%20Conflict.doc
UN High Commissioner for Human Rights, Z. R. A. H. (2017). *Syria worst man-made disaster since World War II*.
UNHCR. (2019). *10 Facts About Refugees*. https://www.unhcr.org/neu/28427-10-facts-about-refugees.html
UNHCR. (2021a). *Child and Youth Protection*. https://www.unhcr.org/child-and-youth-protection.html
UNHCR. (2021b). *REFUGEES AND THE IMPACT OF COVID-19*. https://www.unhcr.org/events/campaigns/5fc1262e4/refugees-and-the-impact-of-covid-19.html
UNHCR. (2021c). *Responding to the Challenge of Non-communicable Diseasesz*. https://www.unhcr.org/5e1352b67.pdf
UNHCR. (2021d). *Syria emergency*.
UNHCR. (2021e, June). *Refugee Data Finder*. https://www.unhcr.org/refugee-statistics/
UNHCR Syria. (2018). *History of UNHCR Syria*. History of UNHCR Syria. https://www.unhcr.org/sy/history-of-unhcr-syria
UNICEF. (2017). *Syrian refugee children in Lebanon at risk of child labour, missing out on education*.
UNICEF. (2019). *FAST FACTS SYRIA CRISIS*. https://www.unicef.org/mena/media/5426/file/SYR-FactSheet-August2019.pdf.pdf

UNICEF Middle East and North Africa. (2015). *Urgent action needed to tackle child labour caused by Syrian crisis – Save the Children and UNICEF*.
UNICEF USA. (2017). *NHCR study uncovers shocking sexual violence against Syrian refugee boys, men*.
UNICEF WHO. (2018). *Polio outbreak in Syria successfully stopped*. https://reliefweb.int/report/syrian-arab-republic/polio-outbreak-syria-successfully-stopped
United Nations. (1951). *Convention relating to the Status of Refugees*. Article 1-undefined. https://www.un.org/en/genocideprevention/documents/atrocity-crimes/Doc.23_convention%20refugees.pdf
United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA). (2020). (2020) Syria crisis overview. *United Nations Office for the Coordination of Humanitarian Affairs*. t https://www.unocha.org/syrian-arab-republic/about-ocha-syria.
Viron, M. J., & Stern, T. A. (2010). The Impact of Serious Mental Illness on Health and Healthcare. *Psychosomatics*, *51*(6). https://doi.org/10.1016/S0033-3182(10)70737-4
WHO. (2011). *World Report on Disability*. https://www.who.int/publications/i/item/9789241564182
WHO. (2019). *Prevention and control of noncommunicable diseases in refugees and migrants*. https://apps.who.int/iris/bitstream/handle/10665/311461/9789289053990-eng.pdf?sequence=1&isAllowed=y
WHO. (2021, March 25). *A virus that respects no borders: protecting refugees and migrants during COVID-19*. WHO. https://www.who.int/news-room/feature-stories/detail/a-virus-that-respects-no-borders-protecting-refugees-and-migrants-during-covid-19
William J Moss, M. R. D. S. A. H. S. W. M. W. I. L. L. M. (2006). Child health in complex emergencies. *Bulletin of the World Health Organization*, 58–64. https://apps.who.int/iris/bitstream/handle/10665/269557/PMC2626512.pdf?sequence=1&isAllowed=y
World Health Organization. (2001). *World health report 2001 - Mental health: new understanding, new hope.*
Yatham, S., Sivathasan, S., Yoon, R., da Silva, T. L., & Ravindran, A. v. (2018). Depression, anxiety, and post-traumatic stress disorder among youth in low and middle income countries: A review of prevalence and treatment interventions. *Asian Journal of Psychiatry*, *38*. https://doi.org/10.1016/j.ajp.2017.10.029