Systematic Review and Meta-Analysis: The Prevalence of Mental Illness in Child and Adolescent Refugees and Asylum Seekers

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Systematic Review and Meta-Analysis: The Prevalence of Mental Illness in Child and Adolescent Refugees and Asylum Seekers

Objective: Over half of the world's refugee population are under the age of 18 years. This systematic review aims to summarise the current body of evidence for the prevalence of mental illness in child and adolescent refugee populations.

Method: Eight electronic databases, grey literature, and Google Scholar were searched for articles from 1 January 2003 to 5 February 2018. Strict inclusion criteria regarding the diagnosis of mental illness were imposed. Study quality was assessed using a template according to study design, and study heterogeneity using I^2 statistic. Random effects meta-analyses results were presented given heterogeneity among studies. The protocol for this systematic review was registered with PROSPERO (CRD42016046349).

Results: Eight studies were eligible, involving 779 child and adolescent refugees and asylum seekers, with studies conducted in five countries. The overall prevalence of post-traumatic stress disorder (PTSD) was 22.71% (95% CI 12.79-32.64), depression 13.81% (95% CI 5.96-21.67), and anxiety disorders 15.77% (95% CI 8.04-23.50). Attention-deficit/hyperactivity disorder (ADHD) was 8.6% (1.08-16.12) and oppositional defiant disorder (ODD) was 1.69% (95% CI -0.78 – 4.16). Due to high heterogeneity, further subgroup analyses were conducted.

Conclusion: Refugee and asylum seeker children have high rates of PTSD, depression, and anxiety. Without the serious commitment by health and resettlement services to provide early support to promote mental health, these findings suggest a high proportion of refugee children are at risk of educational disadvantage and poor social integration in host communities, potentially affecting their life course.

Introduction

Children and adolescents comprise 51% of the world's refugees and asylum seekers,[1] many of whom have experienced significant social and emotional disruption. Many are exposed to potentially traumatic experiences, harsh living conditions, deprivation of basic health care, separation from or loss of family members, and an interrupted education.[2,3] Unaccompanied refugee minors face even greater risks, including increased vulnerability to traffickers and exploitation without the possibly protective buffer of primary caregivers.[4] Experiencing violence and instability at a young age and at critical points in a child's cognitive and emotional development can have a lasting psychological impact.[5,6] While many young people demonstrate resilience and an ability to overcome the chaos and challenges of forced displacement, others are at risk of developing serious mental illness.[7-9]

Despite comprising half the world's refugee and asylum seeker population, there is a lack of high-quality prevalence estimates of mental illness in refugee children and adolescents. There is therefore a lack of clarity on the extent of the public health problem when new forcibly displaced populations of children and adolescents arrive in a country of resettlement, potentially hampering efforts to improve awareness amongst the populations and institutions of host countries, advocate for services, and mobilise resources within health systems and resettlement programs.

Previous systematic and narrative reviews examining the prevalence of mental illness in child and adolescent refugee populations have three limitations:

- a reliance on self-report questionnaires with cut off scores to determine diagnoses that might not be validated for the populations being studied[10-12]

- a focus on specific geographical locations of refugee populations[13]

- a focus on post-traumatic stress disorder (PTSD) rather than the breadth of mental illness[6]

Previous research has largely relied on the use of symptom rating measures and self-report questionnaires. This can explain some of the variability in the reported prevalence of mental illness in this population as these types of measures tend to overestimate symptomatology.[14-16] Self-report measures, although practical for their ease of administration, particularly in low resource settings, are prone to response inaccuracy and issues with item interpretation, which can result in false positives.[17] Individual clinical interviews using validated assessment measures are viewed as the gold standard in assessing mental illness in children and adolescents.[18] A recent review on the epidemiology of PTSD and depression in refugee minors highlighted the need for more rigorous research involving professionals trained in clinical mental health assessments in order to increase the accuracy of the reported prevalence of these conditions.[19]

The global conflicts forcing increasing numbers of populations to become displaced are changing in nature, with the involvement of more civilian populations and increasing targeting of children.[20] Therefore, establishing more current prevalence estimates to inform public policy, in terms of resettlement support and mental health care, for refugee populations is needed. Furthermore, although the vast majority of refugees live in low and middle-income countries, these populations have often been omitted from systematic reviews and studies, hence their inclusion here.

Previous systematic reviews have focussed on PTSD. A comprehensive 2005 systematic review and meta-analysis of adult, and child and adolescent refugees resettled in western countries, identified only five studies reporting the prevalence of PTSD in children and none reporting diagnoses of other mental illnesses (from 1996 to 2002).[21] These studies provided data

on a total of 260 refugee children, of which 11% were diagnosed with PTSD. The samples of children were drawn from Bosnia, Central America, Iran, Kurdistan, and Rwanda. It is therefore timely to update and expand that review.

We have therefore conducted a systematic review which aims to overcome some of the methodological limitations of the current body of evidence and establish a current estimate of mental illness in child and adolescent refugee populations. To our knowledge this is the first systematic review to employ rigorous inclusion criteria regarding the method of diagnosis determination, the first to place no limits on country of origin or resettlement, no limits on publication language, and to include a review of grey literature.

Method

Search Strategy and Selection Criteria

The protocol for this systematic review and meta-analysis was registered with PROSPERO CRD42016046349 (https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=46349). We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).[22] A PRISMA checklist is provided in Table S1 (available online). The protocol was based on that used in the earlier systematic review by Fazel et al.[21] (which included adult, child, and adolescent refugee populations) but expanded the range of databases searched, and number of search terms, imposed stricter criteria for mental illness diagnosis, and placed no restrictions on resettlement countries or publication language. Studies pertaining to child and adolescent populations were extracted for this specific systematic review and meta-analysis.

We undertook a systematic search, developed using the OVID platform, combining Medical Subject Headings (MeSH terms) with related text-based search words, and translated to other databases. An example of the search strategy used in MEDLINE is provided in Table S2,

available online. Studies about refugees or asylum seekers in combination with terms related to mental illness, diagnosis, and trauma were searched across eight databases: MEDLINE; MEDLINE In-Process; EBM Reviews; Embase; PsycINFO; CINAHL; PILOTS, and Web of Science. Any mental illness that met our criteria for diagnostic assessment was accepted. Searching the grey literature using the database Open Grey as well as Google Scholar, allowed for the possible inclusion of reports from refugee, government, and other non-government agencies. The date limits were 1 January 2003 to 5 February 2018. This start date reflects the end date of the search conducted by Fazel et al.[21] Therefore, none of the included studies from the earlier systematic review were included in this analysis, to thus provide a contemporary estimate on mental illness within this population. The reference lists of 67 systematic reviews, 13 of which pertained to child and adolescent samples, were identified through the search and screened for any further relevant articles. This resulted in the manual checking of 17 additional articles, 8 of which were relevant to child and adolescent populations.

Studies were included in this review if (i) the sample included refugee and/or asylum seeker children and/or adolescents, (ii) had a sample size larger than 50, in order to overcome potential sampling bias associated with smaller sample sizes[21] and (iii) reported quantitative prevalence estimates of a mental illness as classified by the Diagnostic and Statistical Manual of Mental Disorders (DSM)[23] or the International Classification of Disease (ICD).[24] The diagnosis must have been made as a result of a clinical interview using a validated diagnostic assessment measure. Studies which based diagnoses solely on self-report questionnaires or symptomatology rating scales were excluded. The interview needed to have been conducted either by a mental health professional (psychiatrist, psychologist, psychiatric nurse) or other trained para-professional (psychology research assistant, trained researcher). In studies which administered the World Health Organization, World Mental Health Composite International Diagnostic Interview (WHO WMH-CIDI),[25] non-clinicians who had completed official WHO

recommended training requirements were accepted. The WHO WMH-CIDI is a fully structured interview for the assessment of mental disorders intended for use by trained lay interviewers. Studies were selected if they had recruited representative samples of refugee children hence those recruiting participants solely from medical clinics were excluded to reduce selection bias. Studies stating that the sample included asylum seekers whose applications had been rejected were excluded if the results were not disaggregated, or if the mental health assessment was not conducted prior to rejection (when the individuals met the definition of asylum seekers). Qualitative or case report studies were excluded. When multiple articles used data from the same study, the article providing data that best met the search criteria was included.

Two reviewers (RB and MGH/GF) independently assessed all the titles, abstracts, and keywords of every article retrieved against the selection criteria. Full text articles were then assessed if the title and abstract suggested that the study met the selection criteria or if there was any doubt regarding eligibility of the article. Disagreements were resolved by discussion and where appropriate, we contacted the study authors for further information. The reviewers contacted 8 study authors to obtain further information regarding methodology and data, of which 7 responded.[26-32] Studies in languages other than English were assessed first by a native speaker where possible or via Google translate, and then officially translated by a professional translation service if potentially meeting inclusion criteria.

Data Extraction and Analysis

Two review authors (RB and MGH) independently extracted statistical data from the included studies into Stata software version 14.1 (StataCorp LP) for the meta-analysis. Study characteristics such as sample size, sampling framework, diagnostic instrument, diagnostic criteria, and use of native interviewer were also extracted. Meta-analysis results were expressed as prevalence estimates of mental illness calculated with 95% confidence intervals (CIs) in the

pooled data. Random effects were presented given heterogeneity among studies. This statistical model is based on the assumption that the samples of the included studies are drawn from different populations.[33] Heterogeneity was assessed using the I^2 statistic.[34] The I^2 value provides a measure of the variation explained by the differences between the included studies rather than chance. In the case of 5 or more studies being available, publication bias was assessed by visual inspection of funnel plots and applying Egger's test[35] set at a threshold of a *p* value less than 0.05 to indicate funnel plot asymmetry. Prevalence rates were for current diagnoses and combined by direct summation of numerators and denominators across studies, thereby providing a pooled estimate.

Possible sources of heterogeneity between studies were investigated, where reported data allowed, by subgroup analyses. These included: sex, duration of displacement (timeframes to be determined by the reported data), visa status, use of native interviewer (whereby the diagnostic interview was conducted in the preferred language of the child or adolescent), and current residence status (residing in the local community versus refugee facility/reception centre).

Risk of Bias Appraisal

Methodological quality of the included studies was assessed by two independent reviewers (RB and KMG) using a risk of bias assessment template (Table S3, available online) according to study design.[36] This template incorporates the Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses and include additional risk of bias components.[37] It has been used in international evidence-based guidelines and other systematic reviews.[38-40] Individual items related to study quality such as internal and external validity, reporting bias, confounding, and conflict of interest were assessed. Studies were assigned a rating of low, moderate, or high risk of bias. Any disagreement was to be reviewed by a third author, but this was not required.

Results

(Insert Figure 1)

The entire search, including electronic databases and other sources, yielded a total result of 17,423 documents. A flowchart outlining the search results and selection of studies is provided in Figure 1. After removing duplicates, 10,419 documents were excluded based on title and abstract and a further 965 documents were screened by full text retrieval. Eight studies pertaining to child and adolescent populations met the inclusion criteria,[29-32,41-44] after a final exclusion of three papers which reported duplicate datasets.[45-47] One study was published in German and professionally translated for inclusion.[30] The eight eligible studies provided data on 779 child and adolescent refugees and asylum seekers. Six studies included both children and adolescents in their samples,[30-32,41,43,44] however two studies recruited solely adolescents; 10 – 19 years[42] and 15 – 18 years.[29] The included studies provided data on the following range of mental illnesses; PTSD, depression, anxiety disorders, attention-deficit/hyperactivity disorder (ADHD), and oppositional defiant disorder (ODD).

Characteristics of the included studies are provided in Table S3 (available online). The age range for each sample was consistent with the World Health Organization definition of child or adolescent (19 years or younger)[48] except for one sample, from a study specifically recruiting unaccompanied asylum-seeking children,[29] that contained some participants aged 20. Considering the focus of the study and that the mean age of participants (16.23±0.83) was within the adolescent range, the authors decided to include it. Studies were undertaken in five countries: Germany (197 refugees),[30,32] Malaysia (90),[42] Norway (160),[29] Sweden (191),[31,41] and Turkey (144).[43,44] Refugee samples were drawn from the Middle East (45%), a combination of Middle Eastern and African countries (31%), and Southern Asia and the Middle East (11.5%). One study reported a sample originating from up to 15 different countries (12.5%).[30] In two of the studies,

a proportion of the participants had been born in the host nation, 4.8% (n=5)[30] and 31.4% (n=32).[31] Disaggregated data was not reported in these studies.

Seven diagnostic measures were used to assess mental illness (Table S4). One of the measures, The Posttraumatic Stress Symptoms in Children (PTSS-C) was specifically developed as a cross-cultural semi-structured interview to diagnose PTSD.[31] Six studies made mention of the psychometric properties of the used instruments and/or previous use with child refugee populations.[29-31,41-43] Four studies conducted the diagnostic interview in the native language of the child or adolescent,[31,41,43,44] three with assistance from interpreters[29,30,42] and one study used a combination of native interviewers and interpreters.[32]

PTSD was investigated in seven studies, with data for a total of 681 children and adolescents.[29,31,32,41,42,44] Overall, 22.71% (95% CI 12.79-32.64) were diagnosed with PTSD (Figure 2). Participants had a weighted mean age of 12.3 years and 40% were girls. There was substantial heterogeneity between the studies ($I^2 = 91.1\%$, $p = 0.000$), therefore subgroup analyses were conducted for duration of displacement, visa status, use of native interviewer, and current residence (Figure 3). The subgroup analysis for sex could not be conducted due to a lack of reported data. PTSD prevalence was higher for those displaced less than two years and for those with an insecure visa status. Conducting the diagnostic interview in the native language of the child or adolescent and current community residence resulted in lower reported prevalence of PTSD.

(Insert figure 2)

(Insert figure 3)

Five studies of depression were identified providing data for a total of 492 children and adolescents.[29,30,42-44] Overall, 13.81% (95% CI 5.96 -21.67) were diagnosed with depression (Figure 4). Participants had a weighted mean age of 12.9 years and 36% of the sample were

girls. One study reported sex data for the total sample (N=104), however only 98 completed the full diagnostic assessment.[30] Two studies reported prevalence of major depression,[30,42] two studies reported prevalence of any depressive disorder,[43,44] and one study reported prevalence of major depression and dysthymia, which was combined for the analysis.[29] There was substantial heterogeneity between the studies ($I^2 = 86.5\%$, $p = 0.000$) so subgroup analyses were conducted for duration of displacement, visa status, use of native interviewer, and current residence (Figure 5). The subgroup analysis for sex could not be conducted due to a lack of reported data. Depression prevalence was higher for those displaced less than two years, those with refugee visa status, use of native interviewer for diagnostic assessment, and current community residence.

(Insert figure 4)

(Insert Figure 5)
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Four studies reporting the prevalence of anxiety disorders were identified consisting of data for a total of 402 children and adolescents.[29,30,43,44] Overall, 15.77% (95% CI 8.04-23.50) were diagnosed with an anxiety disorder (Figure S1, available online). Two studies reported diagnosis of any anxiety disorder[43,44] and two studies provided a breakdown of diagnosis across individual anxiety disorders,[29,30] which were combined for analysis. These disorders included; generalised anxiety disorder, separation anxiety disorder, obsessive compulsive disorder, social anxiety disorder, agoraphobia, and specific phobia. Participants had a weighted mean age of 12.7 years and 32% of the sample were girls. There was substantial heterogeneity between the studies ($I^2 = 76.0\%$, $p = 0.006$) so subgroup analyses were conducted for duration of displacement, visa status, use of native interviewer, and current residence status (Figure S2, available online). Anxiety prevalence was higher for those displaced less than two years, with refugee visa status, use of native interviewer for diagnostic assessment, and current community residence.

Four studies reporting the prevalence of ADHD were identified consisting of data for a total of 322 children and adolescents.[30,41,43,44] Overall, 8.6% (95% CI 1.08 – 16.12) were diagnosed with ADHD (Figure S3, available online). Participants had a weighted mean age of 11 years and 52% of the sample were girls. There was substantial heterogeneity between the studies (I^2 = 84.9%, p = 0.000) so subgroup analyses were conducted for duration of displacement, visa status, use of native interviewer, and current residence status. ADHD prevalence was higher for those displaced longer than two years and for those with an insecure visa status (Figure S4, available online).

Two studies reported prevalence of ODD consisting of data for a total 178 children and adolescents.[30,41] Overall, 1.69% (95% CI -0.78 - 4.16) were diagnosed with ODD (Figure S5, available online). There was a low level of heterogeneity between the studies (I^2 = 9.6%, p = 0.293). Subgroup analyses were not conducted as there were only two studies.

Publication Bias

There is some evidence of publication bias for PTSD and depression, based on the results of the Egger's test where the p values were less than 0.05 (Egger test plots provided in Figure S6-7, available online). The funnel plots showed some asymmetry in the scatter of the studies which can be an indication of publication bias, hence a search of grey literature was conducted. These results, however, should be interpreted with caution as they may, instead be a result of the small number of studies published in the field.

Risk of Bias

Five out of eight studies were assigned a low risk of bias and determined to be of high quality.[29-32,42] Three studies demonstrated moderate risk of bias.[41,43,44] Moderate ratings were assigned as there were potential issues with the representativeness of the samples. In one study, there was a high rate of non-participation.[43] Interviews were conducted with a small number of participants compared to the total number screened. In the second study, immigration lists were unable to be used for recruitment due to the high mobility of the population.[44] Therefore, only families who had registered with the obstetrics and gynaecology departments of the local hospitals were contacted for recruitment. The third study investigated the comorbidity of PTSD and ADHD and the impact of a parental history of torture.[41] They recruited a group of children who had at least one parent with a history of torture, and a comparison group of children whose parents had no history of torture. It could therefore be argued that a proportion of the sample had a greater risk of mental illness due to parental experience of torture. No study was assigned a high risk of bias.

Discussion

This systematic review aimed to overcome some of the methodological limitations of the current body of evidence and establish new estimates of mental illness in child and adolescent refugee populations. The review identified a limited number of high-quality studies measuring prevalence estimates of mental illness, despite the substantial number of children and adolescents displaced globally. Overall, the findings have shown that refugee and asylum seeker children have high rates of PTSD (22.71%), anxiety (15.77%), and depression (13.81%).

PTSD, depression, and anxiety disorders were all higher for those displaced fewer than two years, compared to those displaced greater than two years. However, the prevalence of ADHD was higher among those displaced more than two years. This may be a result of the small number of included studies. Alternatively, this might be partly explained by the phenomena of

spontaneous or natural recovery, which can occur in some cases of PTSD and depression,[49,50] whereas ADHD persists in childhood with some change in presentation as individuals get older.[51] PTSD was higher for those with insecure visa status and temporary residence. This was not the case for depression and anxiety disorders, which were higher for those with refugee visa status and community residence. Rigorous longitudinal research is required to truly understand the relationship between refugee experiences, different mental illnesses, visa status and resettlement experiences, and trajectories of recovery.

The results from our systematic review show higher prevalence for PTSD, depression, anxiety, and ADHD in refugee and asylum seeker populations compared to the literature for non-refugee populations. A recent meta-analysis of 3563 trauma exposed children and adolescents reports a PTSD prevalence of 15.9%.[52] Our systematic review found an overall PTSD prevalence of 22.71% and even higher for those displaced less than two years (35%). However, direct comparisons of PTSD rates are challenging as prevalence varies according to trauma type and sex.[52] In regards to the other mental illnesses, the reported worldwide pooled prevalence of any depressive disorder in general populations of children and adolescents is 2.6%, any anxiety disorder 6.5%, ADHD 3.4%, and ODD 3.6%.[53] While our results were higher for depressive disorders (13.81%), anxiety disorders (15.77%), and ADHD (8.6%), the prevalence of ODD (1.69%) was comparable to the general population estimate, and in fact slightly lower in refugee and asylum seeker children. Overall, this comparison data confirms that refugee children and adolescents have substantial need for mental health services.

These findings build on the previous systematic review by Fazel et al.[21] by providing an updated prevalence estimate for PTSD as well as new estimates for depression and other mental illnesses, based on rigorous diagnostic methods. The prevalence of PTSD reported in this systematic review is higher. The fact that this current review was able to contribute data for the prevalence of depression, anxiety, ADHD, and ODD highlights some growth within the field.

Over half of the world's current refugee and asylum seeker population is aged 18 years and under[1], yet this review was only able to pool data for 779 children and adolescents. This not only limited the precision of our estimates, but demonstrates that this is an under-represented population in the research literature.

Our subgroup analyses and quality assessments highlight the effect that study design can have on prevalence rates and the importance of considering these factors when interpreting current evidence or designing new studies. Previous research has suggested that the use of native interviewers during mental health assessments results in lower reported prevalence of mental illness.[21] This was the case for PTSD, whereby lower prevalence was reported when the interviews were conducted in the child or adolescent's native language. However, for depression and anxiety the prevalence was higher when the interview was conducted in the native language, and for ADHD the results were not significant.

While our intention was to determine the current prevalence of mental illnesses, the generalizability of the results was limited by the lack of studies. Few restrictions were placed on characteristics of the refugee experience, in the hope of including all possible studies, and as a result the meta-analysis yielded expectedly high statistical heterogeneity. Taking this heterogeneity into account, random effects models were used in order to calculate conservative confidence intervals. Meta-regression is often used to assess sources of heterogeneity but was not possible due to limited covariates reported in the included studies. While subgroup analyses were conducted in order to investigate the possible sources of heterogeneity, some subgroup analyses were also not possible due to a lack of reported data, such as sex. As PTSD prevalence rates have been shown to vary by sex, future research should include this analysis.[52] Subgroup analysis for country of origin could not be undertaken as many of the study samples were highly diverse.

Relevant information pertaining to aspects of the refugee experience were lacking such as number of relocations, which has been shown to increase risk of developing mental illness.[56] There was limited information reported on the prevalence of comorbid illnesses, with only two studies providing such data.[41,43] Only one study explored the relationship between parent mental health and child mental health outcomes.[41] The role of family, particularly parental psychopathology, is crucial in its ability to mediate or exacerbate child mental health symptoms.[6,54,57-59] The decision to include the two studies,[30,31] whereby a proportion of the sample had been born in the host nations, may affect the generalizability of the results.

The cross-cultural application of a western psychiatric framework must also be acknowledged as a limitation. Efforts to enhance cultural validity have been made in DSM-5, however the included studies applied DSM-IV and DSM-III diagnostic criteria, which have been criticized for limited recognition of cultural perspectives.[60] The diagnostic framework for PTSD was largely established using adult military samples and single incident trauma survivors from high income nations, which may not adequately capture the post-traumatic symptomatology of refugee youth.[61]

Our quality assessment identified a few limitations of individual studies that are worth noting here. Firstly, one study compared children with and without parents who had a history of torture.[41] Therefore it was not a truly representative community sample, which may explain the high rates of PTSD and ADHD reported in this study. Another study which reported a high prevalence of depression in comparison to the other included studies, described issues with a low participation rate from the initial screened study sample.[43] It is possible that families with children or adolescents experiencing more severe mental distress had a greater motivation to participate. The reported PTSD prevalence from this study was also high in comparison to other studies.

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Implications for Clinical Practice and Policy

Despite the limitations, the findings have implications for clinical practice and resettlement policy. There are immediate and detrimental effects of pre-migration trauma, forced displacement, and the post-migration environment on the mental health of child and adolescent refugee and asylum seekers. With the exception of ADHD, all of the other mental illnesses showed higher prevalence for those recently displaced (2 years or less), emphasizing the need for early support following arrival into a country of refuge. This support may involve adequately resourced refugee centres designed to protect children from further traumatisation and address the many facets of resettlement stressors which can increase risk of poor social integration and educational disadvantage.[54,55] The high prevalence of mental illness within this population leads also to the need to provide youth and refugee appropriate, cross-culturally valid screening in refugee centres in order to streamline allocation to clinical assessment and treatment services.

Implications for Future Research

In order to determine more accurate prevalence estimates, there is an urgent need for large studies which incorporate random sampling of populations, rigorous diagnostic methods, clearly characterise the study sample, report relevant details of the refugee experience, and provide diagnosis data based on sex and age. The limited body of high-quality research in this field is a barrier to the provision of appropriate and informed mental health care for this population.[8] The results have shown that, while the limited literature available focusses on PTSD, depression and anxiety disorders also appear to be highly prevalent within this population. This highlights the need for future research to investigate the full range of mental illnesses. The majority of studies in this field are often undertaken in high income host countries, which may not be countries of first asylum and often differ in terms of post-settlement support. While the studies of this review included key refugee host nations such as Turkey and Malaysia, future

research needs to be conducted in less resourced host nations such as Pakistan, Lebanon, Libya, and Ethiopia. Further research is also needed to identify appropriate and effective real-world examples of mental health support services for refugee children and adolescents, and their families.

The results of this review contribute not just an updated prevalence estimate for PTSD but the largest analysis of PTSD prevalence for this population, based on rigorous diagnostic methods. It has also expanded the current evidence base by contributing prevalence estimates for depression, anxiety disorders, ADHD, and ODD. Overall, the findings confirm that refugee and asylum seeker children have high rates of PTSD, depression, and anxiety. Without a serious commitment by health and resettlement services to provide early support to promote mental health, these findings suggest a high proportion of refugee children are at risk of educational disadvantage and poor social integration in host communities, potentially further affecting their life course.

Figure Titles and Legends

Figure 1: Search results and selection of studies reporting prevalence of mental illness among child and adolescent refugees and asylum seekers

Figure 2: Prevalence of post-traumatic stress disorder in child and adolescent refugees and asylum seekers
Horizontal lines indicate 95% CIs; and open diamond denotes subtotals

Figure 3: Prevalence of post-traumatic stress disorder by various study characteristics
p values derived from random-effects models; horizontal lines indicate 95% CIs.
Note: one study[29] was not included in this analysis as both native interviewers and interpreters were used for the assessment and disaggregated data was not available.

Figure 4: Prevalence of depression in child and adolescent refugees and asylum seekers
Horizontal lines indicate 95% CIs; and open diamond denotes subtotals

Figure 5: Prevalence of depression by various study characteristics
p values derived from random-effects models; horizontal lines indicate 95% CIs.

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Lay Summary

This systematic review aims to identify how common mental illnesses are in child and adolescent refugee populations. Eight studies were eligible, involving 779 child and adolescent refugees and asylum seekers. Refugee and asylum seeker children have high rates of post-traumatic stress disorder (22.7%), depression (13.8%), and anxiety disorders (15.8%). These findings suggest that without mental health support refugee children are at risk of educational disadvantage and poor social integration in host communities, potentially affecting their life course.