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ORIGINAL CONTRIBUTION

Mental health problems of Syrian refugee children: the role of parental factors

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Abstract

War-torn children are particularly vulnerable through direct trauma exposure as well through their parents' responses. This study thus investigated the association between trauma exposure and children's mental health, and the contribution of parent-related factors in this association. A cross-sectional study with 263 Syrian refugee children-parent dyads was conducted in Turkey. The Stressful Life Events Questionnaire (SLE), General Health Questionnaire, Parenting Stress Inventory (PSI-SF), Impact of Events Scale for Children (CRIES-8), and Strengths and Difficulties Questionnaire were used to measure trauma exposure, parental psychopathology, parenting-related stress, children's post-traumatic stress symptoms (PTSS), and mental health problems, respectively. Trauma exposure significantly accounted for unique variance in children's PTSS scores. Parental psychopathology significantly contributed in predicting children's general mental health, as well as emotional and conduct problems, after controlling for trauma variables. Interventions need to be tailored to refugee families' mental health needs. Trauma-focused interventions should be applied with children with PTSD; whilst family-based approaches targeting parents' mental health and parenting-related stress should be used in conjunction with individual interventions to improve children's comorbid emotional and behavioural problems.

Keywords Refugee · Trauma · Child · Parent · Mental health

Background

The United Nations High Commissioner for Refugees' (UNHCR) last report estimated the number of refugee people as 21.3 million [56]. The Syrian Arab Republic has an immense impact on these figures, as the civil war has caused displacement of nearly 12 million Syrians; this includes 6.6 million who have been internally displaced and five million refugees who have fled to other countries. People of Syria were forced to leave their communities because of ongoing fear of killing and persecution, house damage, and lack of health and education services as consequences of warfare [51]. Turkey has become the top host country since the war started in 2011, with the largest refugee proportion. For example, as of November 2017, more than 3 million Syrians were under temporary protection status in Turkey; half of whom were children aged less than 17 years [55].

In recent years, there has been substantive research on the nature, prevalence, and mechanisms leading to a range of mental health problems among the young refugee population. Post-traumatic stress disorder (PTSD) has been predominantly reported in refugee minors, followed by anxiety, depression, and, to a lesser extent, behavioural problems [5, 13–15]. A study conducted in a refugee camp located in Turkey indicated that 45% of Syrian refugee children reported PTSD, 44% displayed significant depression symptoms and around 33% reported somatic complaints [44].

The type, severity, and duration of war trauma experienced have been shown to be associated with PTSD, with a cumulative risk effect. Such war-related traumatic events involve fear of death, persecution, witnessing atrocities, being threatened or injured, and loss of family members or friends [4, 16, 39]; and can predict PTSD symptoms several years post-migration [35, 38]. Post-migratory traumatic events exert additional effects, although pathways to

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child psychopathology may be different [62]. For example, among refugee children living in the UK, the number of pre-migratory traumatic events experienced by families was associated with children's PTSD symptoms, whilst stressors in the host country such as unconfirmed asylum status and economic difficulties were associated with depressive symptoms [22]. Hodes et al. [25] found that war-related traumatic experiences and lack of supporting living arrangements were associated with unaccompanied minors' PTSD symptoms, but not with depressive symptoms.

The long-term effects of trauma have largely been studied among maltreated children [6, 24, 28, 49] literature, with less evidence on refugee children [30, 35]. A retrospective study with 2288 adults diagnosed with either depressive or anxiety disorder showed that participants with history of emotional neglect were more likely to have depressive disorder, as well as dysthymia and social phobia [49]. A number of risk factors have been found to contribute, including the impact of maltreatment on brain structure [10]. The impact of multiple and recurrent traumatic events on the mental health of refugee children may even worsen with time, being compounded by other lifetime stressors such as socioeconomic adversity and social exclusion. For example, refugee children living in the UK for more than 2 years were more likely to be referred to services because of conduct problems compared to children resettled in the UK over less than 2 years, although newly arrived children reported more internalizing symptoms [15].

The mechanisms through which different types of traumatic events can lead to child mental health problems have been studied in relation to several individual (e.g., age, gender, and coping strategies); and environmental factors within the family and community [17, 21, 33]. Parent-related factors are of particular interest, as children and parents are usually concurrently subjected to traumatic events [45]. For example, in a study with Palestinian children and their parents, children's PTSD and anxiety symptoms were associated with both trauma exposure and parents' mental health responses [53]. Another study in Gaza revealed that maternal poor mental health was related to children's both internalizing and externalizing symptoms [40].

Recent studies have increasingly aimed to identify parent-related factors that protect refugee and other war-affected children from developing psychopathology [37]. Despite the limited evidence, factors such as positive parental mental health, parental warmth, and perceived supports have been shown to moderate exposure to trauma among refugee children [41, 52]. Challenges in this research include the different parenting concepts and their measurement, parenting in different cultural contexts, and disentangling the potential effects of trauma- and parent-related factors on the mental health of refugee minors [57].

The rationale for this study was thus to explore this complex relationship between traumatic events, parental psychopathology and parenting-related stress, and child mental health problems among Syrian refugee children in Turkey. The aims were to investigate: (1) the effects of cumulative trauma on children's PTSD and general mental health problems; and (2) the contribution of parents' psychopathology and parenting-related stress in explaining children's mental health problems after controlling for trauma exposure. It was hypothesized that:

1. Trauma exposure would significantly account for unique variance in children's PTSD and mental health problems.
2. Parental psychopathology and parenting stress would significantly contribute in predicting both PTSS and mental health problems, after controlling for trauma exposure.

Methods

Participants

Children were recruited between November 2015 and April 2016 through two NGO-funded Syrian schools located in Istanbul, Turkey. This period preceded the recent policy of refugee children accessing free primary and secondary education, and hence influenced the sampling framework. The selection of the two Syrian schools thus aided recruitment, but may have also carried a selection bias in the profile of children and families attending these schools. Out of 322 children who met the eligibility criteria of having fled from Syria after the war and being aged between 8 and 18 years at the time of data collection, 263 participated in the study, with a response rate of 81.6%. Of them, 134 (51%) were girls and 129 (49%) were boys, with a mean age of 11.6 years (SD 1.86).

Of the participating parents, 82 (31.2%) were fathers and 181 (68.8%) were mothers. Their mean age was 42.2 years (SD 8.2). The majority ($n = 199$, 78%) reported to have very low income [0–1000 Turkish Liras (TL)], 48 (19%) low income (1000–2000 TL), and only 6 (3%) parents reported medium income (2000–3000 TL). Among the parents, 39 (15.4%) had low education level (0–8 years), 105 (41.5%) medium (9–12 years), 85 (33.6) high (13–16 years), and 24 (9.5%) had very high level of education (16 + years). The mean household number was 6.14 (minimum 4 and maximum 14, SD 1.41); whilst the average duration of residing in Turkey was 2.09 years (range 0 months–6 years, SD 1.01).

Research procedure

The participants were recruited over a 6-month period. Considering the possible suspicion and mistrust that might be perceived by trauma-exposed groups, engaging the communities was essential. The research team thus initially contacted Syrian stakeholders who established two non-governmental schools for Syrian refugee children in Istanbul, Turkey. The stakeholders subsequently obtained consent from the two head teachers. The ethics information and consent forms were then distributed to parents by the schools. Since English was not the participants' first language, all documents were translated into Arabic. Two information sheets were prepared for children (aged 8–12 years) and adolescents (aged 13–18 years) using developmentally appropriate language.

Participants completed the questionnaires in paper format, where items were presented in both their native language of Arabic and Turkish. Children were administered the questionnaires in their classrooms during a lesson time (50–55 min), whilst parent reports were distributed and collected via the children by the researcher. Teachers who were also from Syria were present in the classroom during data collection, to help the researcher overcome any arising difficulties such as interpreting and explaining questionnaire items. The study received ethical approval from the University of Leicester research ethics committee. There was no requirement for additional approval because of the independent status of the two schools.

Measures

All questionnaires used in the study were available in bilingual format, i.e., both Arabic and Turkish, since children's and parents' native language was Arabic; whilst some children, who had arrived in Turkey a few years earlier, could also read and understand in Turkish, as well.

Parent-rated questionnaires

The Strengths and Difficulties Questionnaire (SDQ) [20] is a widely used 25-item measure of general child mental health problems. Each item is rated on a scale 0–4 (0 = not true, 1 = somewhat true, and 2 = certainly true). A total difficulties score is generated by summing 20 items, including the sub-scales of emotional, conduct, hyperkinetic, and peer-relationship problems. Internal consistency of $\alpha = .71$ was established.

The General Health Questionnaire 12-item (GHQ-12) [19] was used to measure parental psychiatric morbidity. Each item is rated on a scale 0–3. Total scores were used in this study, with a relatively high internal consistency ($\alpha = .76$).

The Parenting Stress Index (PSI-SF0 [1] is a 36-item questionnaire which assesses stress in the parent–child relationship. The PSI-SF has been validated with various non-English speaking populations, including Arab parents [11, 12]. It includes three sub-scales, parental distress, parent–child dysfunctional interaction, and difficult child. Total scores were used in this study, with satisfactory internal consistency ($\alpha = .86$).

Child-rated questionnaires

The Stressful Life Events checklist (SLE0 [7] was developed to measure pre-migration trauma. The SLE has been validated with refugee minors from a range of ethnic groups. The original version of this self-report scale consists of 12 dichotomous (yes/no) items. However, the item related to sexual abuse was extracted, as it was previously considered by the interpreters as culturally and religiously sensitive for Syrian refugee children [36]. Total trauma scores ranging between 0 and 11 were used in this study.

The Children Revised Impact of Events Scale (CRIES-8) [26] is a cross-culturally validated self-report measure of children's post-traumatic stress symptoms. This includes eight items rated on a four-point scale (0 = not at all, 1 = rarely, 3 = sometimes, and 5 = often), and two subscales, intrusion and avoidance. Total CRIES-8 scores were used, with a relatively high internal consistency ($\alpha = .712$).

The self-rated version of the Strengths and Difficulties Questionnaire was completed by 180 adolescents aged 11–18 years, as per the SDQ guidelines [20].

Statistical analysis

The data were analysed using the Statistical Package for the Social Sciences, SPSS version 22.0 for Windows. The associations between age and gender, and mental health or parental variables were assessed using ANOVA (between-groups) and Pearson's correlation (within-group) tests. The normal distribution of the continuous scores indicated the use of parametric tests. The contribution of trauma exposure, parental psychopathology, and parenting stress in explaining PTSS or general child mental health problems in refugee minors was investigated by hierarchical linear regression [3].

A hierarchical regression model was used, with the order of potential predictors entered in the equation based on the previous research findings [18]. For each dependent variable, predictor variables which were hypothesized to predict this outcome variable were introduced in the initial steps, while exploratory predictor variables which were not necessarily anticipated to predictor the outcome variable based on the existing evidence were entered in the subsequent steps of the equation.

In particular, a series of multiple hierarchical multiple regression analyses were conducted to investigate the contribution of trauma exposure and parental factors in explaining children's PTSD and general, as well as specific (conduct and emotional) problems. Age and gender were controlled for in step 1. In step 2, total trauma exposure scores were introduced in the regression equation. Parental psychopathology and parenting-related stress scores were introduced in step 3 of the analysis as a block.

Results

Descriptive statistics

The mean number of total traumatic events experienced by refugee children was 4.11 (SD 1.92). Of all children, 257 (98.1%) had experienced at least one traumatic event; whilst 64% of them had experienced four or more events. The most frequently reported traumatic events experienced by children were armed conflict in their home country (90.5%), events that one thought of posing threat to themselves or others (60.3%), and loss of someone who they really cared about (52.3%).

Paired samples *t* test was conducted to compare child- and parent-rated SDQ scores. There were no significant differences between child- (*M* 12.56, SD 5.30) and parent-reports (*M* 13.03, SD 5.21); $t(256) = 1.161$, $p = .247$ SDQ total difficulties scores; or between child- (*M* 2.26, SD 1.91) and parent-reports (*M* 2.46, SD 1.83); $t(256) = 1.345$, $p = .180$ of SDQ conduct sub-scale scores. However, there was a significant difference between child- (*M* 4.26, SD 2.28) and parent-rated (*M* 3.76, SD 2.18) SDQ emotional sub-scales, with children reporting significantly higher emotional scores [$t(256) = -2.946$, $p < .05$]. Thus, only parent-rated SDQ total difficulties and conduct problems scores were included in the remaining analysis; in contrast, both parent- and child-rated emotional problems scores were included in separate analyses.

In terms of mental health problems, 130 children (50.2%) scored above the CRIES-8 clinical cutoff for the likelihood of suffering from PTSD (*M* 16.99, SD 9.35). Forty (24%) children were rated by their parents within the 'high'–'very high' SDQ range (*M* 12.66, SD 5.34) of general mental health problems (Table 1).

Among parents, the mean GHQ-12 score was 14.49 (SD 6.46) and the parenting-related stress (PSI) mean score was 94.8 (SD 21.6). Overall, 47% of parents scored above the mean GHQ-12 score and 44% scored above the mean PSI score. There were no significant differences between mothers and fathers on either GHQ-12 [$t(250) = .225$, $p = .822$] or PSI scores [$t(192) = -1.634$, $p = .104$].

Age and gender effects

There was a significant gender difference on trauma exposure at the $p < .05$ level [$F(1, 260) = 4.08$, $p = .044$], as boys (*M* 4.35, SD 1.85) reported significantly higher levels than girls (*M* 3.87, SD 1.97). There were, however, no significant differences according to children' gender on PTSS [$F(1, 257) = .019$, $p = .890$], general child mental health problems [$F(1, 258) = .233$, $p = .630$], parental psychopathology [$F(1, 250) = .404$, $p = .526$], or parenting stress [$F(1, 192) = .928$, $p = .336$].

A Pearson product moment correlation coefficient was computed to assess the relationship between children's age, trauma exposure, PTSS, general child mental health problems, parental psychopathology, and parenting-related stress. There was a significant positive association between age and traumatic experiences ($r = .125$, $n = 262$, $p < .05$), i.e., older children were exposed to more traumatic events. In contrast, there were negative associations between age and

Table 1 Continuous scores and frequency rates of child-rated CRIES and parent-rated SDQ scores among Syrian refugee children in Turkey

	Total/sub-scale scores	Mean (SD)	*N*/%
PTSS	PTSD	16.9 (9.3)	130/50.2
	Intrusion	8.7 (5.2)	
	Avoidance	8.1 (5.5)	

	Mean (SD)	SDQ scores within clinical subthreshold and threshold		
		Slightly raised	High	Very high
General child mental health problems				
Total difficulties	12.6 (5.3)	29/18%	24/14%	16/10%
Emotional problems	3.62 (2.2)	15/10%	5/3%	23/15%
Conduct problems	2.37 (1.8)	11/7%	8/5%	10/6%
Hyperkinetic problems	3.60 (1.9)	26/16%	1/.6%	1/.6%
Peer-relationship problems	3.08 (1.6)	24/18%	16/12%	29/22%

total SDQ scores ($r = -.151$, $n = 260$, $p < .05$), conduct problems ($r = -.121$, $p < .05$), and hyperkinetic problems ($r = -.127$, $p < .001$); as well as PSI parent–child dysfunctional interaction scores ($r = -.174$, $p < .05$); i.e., externalizing and parent–child interaction problems were more prominent among younger children (Table 2).

Contribution of trauma exposure and parental factors in explaining children's mental health problems

A hierarchical multiple regression was first conducted to test the value of trauma experiences and parental factors in predicting children's PTSS, after controlling for age and gender. At step 1, age and gender did not indicate statistical significance in explaining PTSS: $F(2, 185) = .643$, $r = .083$, $r^2 = .007$, adj. $r^2 = -.004$, $p = .52$. Introducing the trauma exposure variable in Step 2 led to a statistically significant change in R^2 for PTSS scores ($\Delta R = .62$, $p < .001$). Adding parental psychopathology and parenting stress factors to the regression in step 3, however, did not result in a statistically significant change ($\Delta R = .001$, $p = .882$).

The same procedure was repeated in explaining children's general mental health problems (total SDQ scores—Table 3). Younger age and female gender showed statistical significance in explaining SDQ scores at step 1, $F(2,188) = 3.151$, $r = .180$, $r^2 = .032$, adj. $r^2 = .022$, $p = .045$. Introducing the trauma exposure variable in step 2 did not lead to a statistically significant change in R^2 ($\Delta R = .000$, $p = .797$). Adding parenting factors to the regression in step 3, however, contributed significantly in predicting SDQ scores ($\Delta R = .076$, $p < .05$). Parents' psychopathology furthermore, accounted for unique variance.

A further two hierarchical regression analyses were run to test the effect of trauma exposure and parental factors in explaining parent-rated conduct and parent-rated emotional sub-scale scores, respectively. First, conduct problems scores were entered as the dependent variable. Unlike the general mental health problems results, age and gender did not indicate statistical significance in predicting conduct problems: $F(2, 188) = 1.037$, $r = .104$, $r^2 = .011$, adj. $r^2 = .000$, $p = .357$. Introducing the trauma exposure variable in step 2 did not lead to a statistically significant change in R^2 ($\Delta R = .000$, $p = .842$). Adding parental psychopathology and parenting stress to the regression in step 3, however, contributed significantly in predicting SDQ scores ($\Delta R = .035$, $p < .05$).

When parent-rated emotional problems scores were entered as the dependent variable, and similar to the SDQ total difficulties regression results, younger age and female gender showed statistical significance in explaining emotional problems at step 1: $F(2, 188) = 3.621$, $r = .193$, $r^2 = .037$, adj. $r^2 = .027$, $p = .029$. Furthermore, female gender accounted for unique variance. Introducing the trauma

Table 2 Pearson's product–moment correlation matrix between the indices of trauma exposure, parental factors, and child mental health scores

Variable	1	2	3	4	5	6
Age	–					
SLE	.125*	–				
PTSS	.042	.213**	–			
SDQ	− .151*	− .050	− .001	–		
GHQ	− .069	.062	.006	.283**	–	
PSI	− .174*	− .072	.019	.144*	.096	–

SLE total trauma score, *PTSS* child-rated post-traumatic stress score, *parent-rated SDQ* total difficulties score, *GHQ* parental psychopathology total score, *PSI* parenting stress total SCORE

*$p < .05$; **$p < .01$

Table 3 Summary of hierarchical regression analysis for trauma exposure, parental psychopathology, and parenting-related stress variables predicting PTS and emotional/behavioural symptoms, after controlling for age and gender

Predictor	CRIES scores				SDQ scores			
	B	*β*	*t*	Sig	*B*	*β*	*t*	Sig
Step 1								
Age	.21	.04	.597	.551	− .32	− .11	− 1.58	.116
Gender	− .04	− .02	− .031	.675	.84	.08	1.12	.262
Step 2								
Total trauma exposure	1.14	.25	3.47	.001	− .01	− .03	− .078	.938
Step 3								
Parents' psychopathology	− .01	− .00	− .013	.989	.19	.25	3.54	.001
Parenting stress	.01	.03	.500	.618	.02	.10	1.42	.157

exposure variable in step 2 did not lead to a statistically significant change in R^2 ($\Delta R = .001$, $p = .678$). Entering parenting factors to the regression in step 3, however, contributed significantly in predicting SDQ scores ($\Delta R = .063$, $p < .05$), with parents' psychopathology furthermore, accounting for unique variance.

Because of the previously reported significant difference between parents and children in reporting emotional problems (higher scores by children), the latter model was repeated with child-rated emotional problems as dependent variable. Unlike the parent-rated emotional problems results, age and gender did not show statistical significance in explaining emotional problems at step 1: $F(2, 187) = 1.944$, $r = .143$, $r^2 = .020$, adj. $r^2 = .010$, $p = .146$. However, similar results were found in the following steps. Entering the trauma exposure variable in step 2 did not lead to a statistically significant change in R^2 ($\Delta R = .004$, $p = .390$). Introducing parenting factors to the regression in step 3 contributed significantly in predicting SDQ scores ($\Delta R = .035$, $p < .05$), with parents' psychopathology furthermore, accounting for unique variance.

Discussion

This study aimed to investigate the effect of trauma exposure on children's mental health problems and, in particular, the contribution of parents' own mental health and parenting-related stress. The results indicate that being exposed to trauma significantly contributed in predicting children's PTSS; whilst children's younger age, female gender, parental psychopathology, and parenting stress were variably found to be statistically significant in explaining overall mental health problems, as well as specific emotional and conduct problems.

Half of the participating Syrian refugee children scored above the clinical cut-off score for likely presence of PTSD, a finding broadly consistent with the previous research in similar contexts [25, 29, 46, 54]. The rate of likely general mental health problems reported by parents was 24%, which was lower than for PTSD rates, but similar to overall morbidity based on the SDQ and similar measures previously reported [37, 47]. Comparison of child- and parent-rated general mental health and conduct problems showed that children and parents ratings did not differ significantly. However, parents under reported children's emotional symptoms, which is also consistent with previous research [48]. More traumatic experiences were reported by boys than girls. In terms of age, moreover, younger children were reported as having been exposed to less traumatic events, but presenting with more mental health problems and associated parenting stress. This finding could be explained by cultural and gender factors of older boys being more exposed to conflict, at least in public settings, or at older participants' more accurate recollection of traumatic events.

The effects of trauma exposure have widely been studied in the child mental health literature. Although the existing evidence is broadly consistent on the association between trauma exposure and a range of child mental health problems, the underpinning mechanisms involving different factors, especially in relation to refugee parents, remain relatively scarce [58]. This study found that, whilst trauma exposure was, as hypothesized, associated with post-traumatic stress symptoms, both parental psychopathology and parenting-related stress were associated with general mental health problems (total SDQ, emotional, and/or conduct scores) but not with PTSS. Congruent with this pattern is the finding from an earlier study by Durà-Vilà et al. [15] that war-related traumatic events predicted PTSS, whilst parent- and peer-related factors such as lack of family integration and social support were significantly associated with depressive symptoms. This is important for further research in understanding the mechanisms and pathways that lead to different types of child mental health problems [43], to further inform universal and targeted interventions.

Although studies with other groups of vulnerable children have established the relationship between parental capacity, psychopathology, and parenting-related stress with child mental health problems [27, 32, 45], there is still dearth of such research with war-affected children. In the present study, parents' psychopathology was the unique predictor in terms of children's general mental health problems, which is similar to what Qouta et al. [40] found in the face of ongoing war conflict exposure. Furthermore, in an earlier study conducted in Canada with school-age refugee children, parental depression was an important correlate of children's emotional problems [42], along with the type of household and family conflict. These studies did not indicate that parental factors contributed significantly in predicting children's PTSD, except for parents suffering from PTSD themselves [53].

These findings should be considered within the context of certain methodological research limitations. As already acknowledged, the sample was recruited from two Syrian schools rather than across local schools and communities. This may have excluded children with higher rates of needs, who either could not attend school for socioeconomic reasons, having been more traumatized, or being in transit to Europe. Parents' PTSS were not measured in the present study; instead, only their general psychiatric morbidity was reported. Similarly, parents did not evaluate their children's PTSS, which relied only on self-reports; thus, the established rates of likely PTSD may have been different. Equally, parents' own mental state and traumatic experiences may have influenced their SDQ ratings. Finally, a longitudinal design would enable a better

understanding of how the impact of trauma and adversity may impact on refugee children and parents at different stages of their migration process. Such research is important in informing interventions at each of these stages, but is constrained by, among other factors, the lack of more detailed and sensitive trauma exposure measures.

It is well established that complex trauma has long-term effects on the mental health of children and young people, although the pathways lead to continuities or discontinuities of psychopathology. Kinzie and Sack's earlier studies with Cambodian refugee children were influential in gaining such understanding [29, 30, 43], and have since been replicated by further longitudinal studies that aimed to identify both risk and protective predictors of outcome [23, 35]. Parents' exposure and response to war trauma have been established as such a key factor [11, 31]. Iranian adolescents whose fathers were war veterans with chronic PTSD reported higher level of aggression and anxiety than their comparison peer group [2].

In conclusion, the findings of this study lay support in providing both trauma-focused and family-based interventions. Their integration would be consistent with the ecological framework. Bronfenbrenner [9] suggested that child development cannot be fully understood without considering the child's relationship with their micro- (parents, teachers, and peers) and macro-environment (community, culture, and religion). This theory has been influential in developing resilience-building interventions [8], although evidence on their indications and effectiveness remains scarce [59]. Only few intervention studies have involved trauma-exposed refugee parents and children together using approaches such as cognitive-behavioural therapy (CBT), supportive psychotherapy, or psychoeducation for family groups [34, 50, 60, 61]. Establishing joint care pathways is essential in host countries, with child and adult mental health services working closely together, as well as with social care services and NGOs. Such pathways should enable direct access to mental health services to transient refugee families that are less likely to seek help through mainstream health care systems. Future research should evaluate the appropriateness and effectiveness of culturally adapted interventions for children and their families at different stages of migration.

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Compliance with ethical standards

Conflict of interest No conflict of interest by any of the authors

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