

Parental Posttraumatic Stress and School Performance in Refugee Children

Lisa Berg ^{1,2}, Monica Brendler-Lindquist,³ Edith de Montgomery,⁴ Ellenor Mittendorfer-Rutz,⁵ and Anders Hjern^{2,6}

¹Department of Public Health Sciences, Stockholm University, Stockholm, Sweden

²Centre for Health Equity Studies, Stockholm University/Karolinska Institutet, Stockholm, Sweden

³Red Cross Centre for Tortured Refugees, Stockholm, Sweden

⁴Department of Public Health, Danish Institute for Migration, Ethnicity, and Health, University of Copenhagen, Copenhagen, Denmark

⁵Department of Insurance Medicine, Karolinska Institutet, Stockholm, Sweden

⁶Clinical Epidemiology, Department of Medicine, Karolinska Institutet, Stockholm, Sweden

Refugee children in the Nordic countries have been reported to perform poorly in school and carry a high burden of familial posttraumatic stress. The present study aimed to investigate the impact of maternal and paternal posttraumatic stress on the school performance of refugee children. We used national register data on school grades at age 15–16 along with demographic and migration indicators during 2011–2017 in a population of 18,831 children in refugee families in Stockholm County, Sweden. Parental posttraumatic stress was identified in regional data from three levels of care, including a tertiary treatment center for victims of torture and war. Multivariable linear and logistic regression models were fitted to analyze (a) mean grade point averages as Z scores and (b) eligibility for upper secondary school. In fully adjusted models, children exposed to paternal posttraumatic stress had a lower mean grade point average, $SD = -0.14$, 95% CI $[-0.22, -0.07]$, and higher odds of not being eligible for upper secondary education, $OR = 1.37$, 95% CI $[1.14, 1.65]$. Maternal posttraumatic stress had a similar crude effect on school performance, $SD = -0.15$, 95% CI $[-0.22, -0.07]$, $OR = 1.25$, 95% CI $[1.00, 1.55]$, which was attenuated after adjusting for single-parent households and the use of child psychiatric services. The effects were similar for boys and girls as well as for different levels of care. Parental posttraumatic stress had a small negative effect on school performance in refugee children, adding to the intergenerational consequences of psychological trauma.

The number of refugees worldwide has grown gradually during the last decade, reaching almost 80,000,000 globally by the end of 2019, half of whom are children (United Nations High Commissioner for Refugees, 2019). In the European Union, approximately 800,000 children applied for asylum between 2015 and 2017, with Sweden emerging as one of the countries with the highest numbers per capita (World Health Organization [WHO], 2018). Education plays a key role for children

in refugee families with regard to their integration into high-income societies (Borsch et al., 2019). Refugees often lack a support network that can buffer the dire effects of school failure during their resettlement trajectory from childhood to independent adulthood (Torslev & Rothe Borsch, 2017). Findings from a recent Nordic study showed that both average grades from compulsory school and the percentage of individuals with upper secondary educational attainment were lower among children in refugee families than their Nordic counterparts (Dunlavy et al., 2020). In this study of national cohorts, children in all four Nordic countries who were born into refugee families in exile performed better in school than children who themselves were refugees, and children who arrived when they were of preschool age had higher levels of educational attainment than those who arrived during school age. Analyses of educational attainment in immigrant families in Sweden have shown a considerable attainment gap between children in immigrant and native families and demonstrated associations between educational attainment and socioeconomic factors such as low levels of parental education, residency in low-status neighborhoods, and single parenthood (Taguma et al., 2010).

The authors have no conflict of interest to disclose.

Correspondence concerning this article should be addressed to Lisa Berg, Department of Public Health Sciences, Stockholm University, 106 91 Stockholm, Sweden. E-mail: lisa.berg@su.se

© 2021 The Authors. *Journal of Traumatic Stress* published by Wiley Periodicals LLC on behalf of International Society for Traumatic Stress Studies. View this article online at wileyonlinelibrary.com
DOI: 10.1002/jts.22708

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

Psychological trauma related to experiences of war and political persecution is a common occurrence in refugee populations (Blackmore et al., 2020). Such experiences may have long-term sequelae due to posttraumatic stress. Posttraumatic stress disorder (PTSD) was the first diagnostic concept directly associated with psychological trauma to be introduced into international diagnostic classification systems, and it remains a cornerstone in research on the consequences of psychological trauma (Shalev et al., 2017). More recently, other diagnostic concepts have been created to capture the more chronic personality changes seen after severe and repeated trauma, such as torture. In the *International Classification of Diseases* (10th rev; *ICD-10*), the diagnosis of “enduring personality change after catastrophic experience” (EPCACE) was introduced as a diagnosis of such consequences (Beltran et al., 2009; World Health Organization, 2019), and the most recent revision of the *ICD* (i.e., the *ICD-11*) introduced a diagnosis of complex PTSD (Moller et al., 2020; World Health Organization, 2021).

Posttraumatic stress influences intimate relations, with secondary consequences for the spouses and offspring of exposed individuals (Dalgaard et al., 2016). These consequences were initially described in children of Holocaust survivors in the 1970s, which gave rise to the concept of the intergenerational effects of trauma exposure (Kellerman, 2001). The pathways of transmission have been described primarily as relational (Dalgaard et al., 2016), but, recent research has also suggested biological pathways through epigenetic mechanisms (Bierer et al., 2020). The intergenerational effects of psychological trauma have been investigated in a large number of empirical studies on mental health since the 1970s, particularly in the offspring of Holocaust survivors. In a meta-analysis van Ijzendoorn et al. (2003) summarized 32 studies of mental health in children of Holocaust survivors and concluded that there were negative consequences for the children but that they were limited to the children of psychiatric patients only.

Parental psychiatric disorders, such as schizophrenia and depression, have been shown to have a negative influence on the educational attainment of affected individuals’ offspring. The mechanism behind this effect has yet to be well elucidated but is assumed to relate to the impact of parental mental health problems on parental educational support and inspiration (Lin et al., 2017). Parental experiences of posttraumatic stress have also been associated with adverse effects on family functioning and child–parent interactions, which may impact children’s outcomes (Bryant et al., 2018; van Ee et al., 2017). Previous studies have demonstrated adverse consequences of parental posttraumatic stress regarding children’s mental health and psychosocial adjustment (Bryant et al., 2018; Reid & Berle, 2020), children’s psychiatric hospital contacts (Back Nielsen et al., 2019), and family-related violence (Montgomery et al., 2019). Considering the substantial literature on the intergenerational consequences of psychological trauma, the knowledge gap regarding how the consequences of parents’ traumatic experiences may affect the educational achievement of their children is somewhat surprising. In a single study on this topic, Berg et al.

(2019) demonstrated higher levels of school failure in a national cohort of native and immigrant children of parents diagnosed with PTSD and/or depression in specialist care, with effects ranging from 0.46 to 0.50 standard deviations from mean grade point averages in children with Swedish-born parents and effects ranging from 0.30 to 0.37 standard deviations in Swedish-born children of parents born in a country from which many refugees originate. Berg and colleagues demonstrated that the impact of posttraumatic stress alone on school performance was elevated relative to parental depression alone and similar to the combination of PTSD and depression.

In their study of educational achievement in children in refugee families in the Nordic countries, Dunlavy et al. (2020) showed that among children in immigrant families in Sweden, foreign-born children in refugee families were particularly at risk for school failure. This may be because the children themselves had been exposed previously to stressful events both during and after their flight to Sweden, which may have interacted with parental posttraumatic stress. Thus, the present study aimed to investigate the intergenerational consequences of paternal and maternal posttraumatic stress on school performance in both Swedish-born and foreign-born children in refugee families, taking into account the child’s own mental health problems. A secondary aim was to investigate whether the influence of parental PTSD on school performance was increased in children of parents treated at a tertiary center for victims of torture and war compared to being treated in primary or secondary care settings.

Method

Participants and Procedure

The present study was based on demographic, educational, and migration data from national registers linked to regional data on health care in the Stockholm region of Sweden. Linkage of different registers is made possible in Sweden via a unique personal identification number assigned to all residents at birth or upon immigration. In the register data prepared for research, these numbers are routinely replaced with random reference numbers by the register holders—in this case, Statistics Sweden—and the data are further anonymized by the use of broad categories for variables that potentially could be used to identify individuals, such as country of birth, birth date, or place of residence, before the data are made available for research. This anonymization process, which excluded informed consent for logistical purposes, was approved by the Stockholm Region Ethics Committee (Dnr 2016/1610-31/5).

Using information from the Swedish Register of the Total Population (Ludvigsson et al., 2016), the study population was created from children born between 1995 and 2000 who were residents in Stockholm County the year of their 15th birthday. Normally, this is the year before graduation from compulsory school in Sweden. The national immigration and emigration database (STATIV) was used to provide relevant refugee data

for parents and children, such as the year of residency and reason for residency. Children were linked to their birth parents in the Swedish Multi-Generation Register (Ekbom, 2011) and categorized as having a refugee background if they or at least one parent had been granted a residence permit as a refugee. Of these children, 84.8% had two birth parents recorded in the Multi-Generation Register, 12.8% had only a mother recorded, and 2.4% had only a father recorded. The study population included 18,831 foreign- and Swedish-born children of refugees, 2,688 of whom had one Swedish-born parent and one foreign-born parent; the remaining children had only foreign-born birth parents. This definition excluded children without any resident birth parent in Sweden (i.e., unaccompanied minors).

The age that residency was obtained was categorized into four categories: born in Sweden, preschool (0–6 years old), early school age (7–12 years old), and late school-age (13–15 years). Information on the parents' and children's country or region of birth was retrieved from the Swedish Register of the Total Population. Maternal country of origin was used to categorize the family's background as having originated in a low-, middle- or high-income country, according to the World Bank classification of 2011 (World Bank, 2017; see Supplementary Table S1).

Measures

School Performance

The outcome variables were created using data from the National School Register regarding children's grades at the end of the final, ninth compulsory school year in Sweden. These data are collected from all Swedish schools (i.e., both public and private) by the Swedish National Agency for Education and are used to perform quality evaluations of schools and gather national educational statistics (European Commission, 2020). In each of the 16 subjects taught, ninth-grade teachers assign one of the following grades: not pass, pass, pass with distinction, and pass with great distinction; these grades are then given point values of 0, 10, 15, and 20, respectively. Grades are evaluated and assigned based on predetermined goals in a national curriculum. As teachers are encouraged to use a range of information when assigning these grades, classroom performance and assignment results are considered in the grading process. When inspecting schools, the Swedish National Agency for Education can also ensure that school grade averages remain in line with the results of national testing. The sum of teacher-assigned grades is consequential with regard to available school choices at the upper-secondary level (i.e., age 17–19 years) whereby only students with passing grades in Swedish, English, and mathematics are eligible for transitioning to the secondary level (Szulkin & Jonsson, 2007).

We employed three outcome variables. First, we examined grade point averages for the year of graduation. To make this score equivalent between graduation years, Z scores were created based on the standard deviations of the mean grade point averages in the total student population in Stockholm County

each year (DeVore, 2017). Second, we assessed eligibility for upper secondary-level education programs (i.e., yes or no). Finally, we indicated whether there was a record of graduation. Having no record of graduation from compulsory school indicates either that the student was educated in a special, nonmainstream education setting or had repeated one or several courses and did not graduate before the end of the follow-up period in 2016.

Parental Posttraumatic Stress

Information on parental posttraumatic stress was retrieved from three levels of care: (a) primary care, using an *ICD-10* diagnosis of PTSD (F43.1) or EPCACE (F62.0) recorded by a primary care physician in the regional health care database in the Stockholm region during 2006–2017; a record of a PTSD diagnosis in this database has been validated against patient records and found to have acceptable quality for epidemiological research (Hollander et al., 2019); (b) secondary care, using an *ICD-10* PTSD or EPCACE diagnosis, recorded at a psychiatric clinic during 2006–2017; and (c) tertiary care, whereby an individual was recorded as being a patient at the Red Cross Center for Tortured Refugees in Stockholm between 2006 and 2014.

Demographic Characteristics and Parental Educational Attainment

Demographic data, such as birth year and sex, were obtained using the Register of the Total Population. Parental educational attainment and family status when the child was 15 years old were identified and retrieved from the national Longitudinal Integrated Database for Health Insurance and Labour Market Studies (Ludvigsson et al., 2019). Parents' highest level of educational attainment was categorized as compulsory school or less (i.e., 0–9 years), upper secondary school (i.e., 10–13 years), and university (i.e., 13 years or more). Family status was coded as single-parent household (i.e., yes or no). An indicator of having been in child psychiatric care between 2011 and 2017 was based on information from the regional database and coded as "yes" or "no."

Data Analysis

Parental posttraumatic stress was categorized as no parent posttraumatic stress, posttraumatic stress in mothers only, posttraumatic stress in fathers only, and posttraumatic stress in both parents. We calculated Z scores of grade point averages and analyzed them in linear regression models. Logistic regression models were used to analyze the effects of the same three parental indicators of posttraumatic stress on (a) secondary education eligibility (b) having no record of graduation from compulsory school.

Based on previous research, the regression analyses included four consecutive models wherein the first three models were adjusted for covariates considered to be confounders. Model 1 included graduation year and sex; Model 2 adjusted further

Table 1
Prevalence of Parental Posttraumatic Stress, by Covariate

Variable	Full sample (<i>n</i>)	Father posttraumatic stress (%)	Mother posttraumatic stress (%)	Both parents posttraumatic stress (%)
Sex				
Girls	9,232	5.4	5.4	1.0
Boys	9,599	6.1	5.6	1.1
Age child received residence permit (years)				
Swedish-born	11,041	4.8	4.6	0.6
0–6	2,508	8.9	6.7	1.9
7–12	3,839	7.1	7.5	1.9
13–15	1,443	3.9	5.2	1.0
Maternal country of origin				
High-income country	2,377	2.4	2.7	0.0
Middle-income country	9,765	8.3	7.1	1.6
Low-income country	6,239	3.1	4.5	0.6
Parental educational attainment				
University (≥ 13 years)	8,689	5.5	5.4	1.2
Upper secondary school(10–12 years)	6,726	5.5	5.0	0.8
Compulsory school or less(≤ 9 years)	3,415	7.0	6.8	1.2
Single parent household				
No	11,773	5.1	4.8	1.1
Yes	6,258	6.3	7.0	1.0
Child/adolescent psychiatric care				
No	16,836	4.7	4.0	1.1
Yes	1,995	4.3	7.8	1.1
Total	18,831	5.8	5.2	1.1

for socioeconomic factors primarily associated with the country of origin, paternal education, and economic level of the country of origin; Model 3 further adjusted for the age the child received a residence permit; Model 4 further adjusted single-parent households and child psychiatric care utilization, covariates that could potentially mediate the association between exposure to outcome.

To investigate the potential influence of missing parents in the analyses that adjusted for single-parent households, we conducted a sensitivity analysis in children who had two recorded parents in the Multi-Generation Register. Interaction analyses with sex were carried out for all three outcomes, but because no statistically significant interaction was revealed, $ps = .691-.957$, no sex-stratified analyses are presented. Robust standard errors (*SEs*) were used to account for correlations between children of the same mother. All analyses were conducted using SPSS (Version 25.0).

Results

The study population consisted of 18,831 adolescents in 14,399 refugee families. Of these adolescents, 59.4% were born

in Sweden and 40.6% were foreign-born. The mothers of the adolescents mostly originated from middle-income countries (63.1%), primarily Iraq, Syria, Iran, or the former Yugoslavia, whereas 23.2% of mothers originated in low-income countries, primarily those in the Horn of Africa (Supplementary Table S1). Most mothers who originated from a high-income country were Swedish-born.

As shown in Table 1, 12.1% of the children in the study had at least one parent who was treated for or received a diagnosis related to posttraumatic stress. The prevalence of posttraumatic stress was highest in mothers and fathers from middle-income countries and those with low levels of educational attainment. Maternal posttraumatic stress was more common than paternal posttraumatic stress in single-parent households and among children who had received psychiatric care.

Table 2 shows the measures of school performance, grouped by exposure and covariates, among the 17,252 individuals who were recorded to have graduated from compulsory school by 2016. The mean grade point average in the graduated refugee population was -0.29 standard deviations lower than the general population average in Stockholm County, of which the

Parental PTSD and School Performance

Table 2
Educational Outcomes, by Exposure and Covariates

Covariate	Individuals with complete information of school performance (<i>n</i> = 17,252)			Individuals with no record of graduation (<i>n</i> = 1,579)	
	All (%)	Grade (<i>M</i> points, <i>Z</i> score ^a)	Ineligible for upper secondary education (%)	All (%)	No record of graduation (%)
Paternal posttraumatic stress care use					
Red Cross Centre	1.1	-0.50	28.3	1.5	11.4
Psychiatric specialist care	2.7	-0.41	21.7	2.6	8.0
Primary care	2.2	-0.42	23.1	2.7	10.6
Any	5.7	-0.43	23.3	6.7	9.8
Maternal posttraumatic stress care use					
Red Cross Centre	0.8	-0.51	26.9	1.5	15.1
Psychiatric specialist care	3.0	-0.47	23.6	2.3	6.7
Primary care	1.8	-0.34	20.1	1.5	7.0
Any	5.5	-0.43	23.1	5.3	8.0
Both parents posttraumatic stress					
Yes	1.1	-0.48	24.4	1.4	11.1
Sex					
Girls	49.7	-0.14	17.7	42.1	7.5
Boys	50.3	-0.13	20.5	57.9	9.5
Age child received residence permit (years)					
Born in Sweden	59.8	-0.10	11.2	46.3	6.6
0-6	13.5	-0.20	13.6	11.7	7.4
7-12	19.2	-0.50	28.5	27.6	11.4
13-15	7.0	-1.51	71.0	14.4	15.8
Parental country of origin					
High-income country	12.9	-0.13	11.7	9.3	6.2
Middle-income country	52.7	-0.22	17.4	42.8	6.9
Low-income country	32.3	-0.40	22.7	42.4	10.7
Parental educational attainment					
University (≥ 13 years)	46.3	-0.01	11.3	38.0	6.9
Upper secondary school (10-12 years)	36.0	-0.36	19.1	33.1	7.8
Compulsory school or less (≤ 9 years)	17.2	-0.91	40.4	28.9	13.4
Single parent household					
No	67.0	-0.18	16.5	65.6	7.7
Yes	33.0	-0.45	22.4	35.4	8.9
Child and adolescent psychiatric care use					
No	90.0	-0.24	17.9	83.3	7.8
Yes	10.0	-0.72	29.4	17.7	13.2
All	100.0	-0.29	19.1	100	8.4

Note.^a *Z* scores were created based on the standard deviations of the mean grade point averages in the total student population in Stockholm County each year.

refugee population was a part. Among graduates, 19.2% were not eligible for upper-secondary education.

Grade point averages and percentages of individuals who obtained upper-secondary education eligibility were highest in girls, children born in Sweden, those who lived with both parents, and those who had at least one parent with a university-level education. The lowest grade point averages and lowest

percentages of individuals eligible for secondary education were found in children of parents who had been patients at the Red Cross Center for Tortured Refugees, foreign-born children who settled in Sweden when they were of school age, and children who had received previous psychiatric care. Of the total study sample, 8.4% (*n* = 1,579) of participants had no record of graduation from compulsory school. Educational

outcomes, grouped by exposure and covariates, for adolescents with no record of graduation are also shown in Table 2. The highest percentages of children with no record of graduation were found in children who settled in Sweden when they were of late school-age and children of parents who received care at the Red Cross Centre for Tortured Refugees.

Table 3 shows the Z scores obtained from linear regression analyses of mean grade point averages in relation to indicators of parental posttraumatic stress. In Model 3, having two parents affected by posttraumatic stress was associated with an effect of -0.19 standard deviations from the mean, 95% CI $[-0.35, -0.03]$. Having a father with posttraumatic stress was associated with an effect of -0.15 standard deviations, 95% CI $[-0.22, -0.07]$, and having a mother with posttraumatic stress was associated with an effect of -0.11 standard deviations from the mean, 95% CI $[-0.19, -0.03]$. Adjusting further for the use of child psychiatric services and single-parent households in Model 4 attenuated the effect of maternal posttraumatic stress but not the effect of paternal posttraumatic stress nor the effect of having two parents with posttraumatic stress. Interaction analyses demonstrated no significant differences between Swedish-born and foreign-born children, $p = .138$.

A sensitivity analysis of the 84.8% of the study sample with two parents recorded in the Swedish national registers yielded very similar effect estimates but slightly lower R^2 estimates (Supplementary Table S2). Interaction analyses were carried out with all covariates, but these analyses demonstrated no statistically significant results.

In analyses of the setting in which parental posttraumatic stress-related diagnoses were given and mean adolescent grade point averages, care given at the Red Cross center had the highest estimate in Model 1, $SD = -0.23$ SD, 95% CI $[-0.35, -0.10]$, compared to -0.16 standard deviations from the mean, 95% CI $[-0.23, -0.09]$, for specialist care and -0.09 standard deviations, 95% CI $[-0.17, 0.01]$, for primary care. However, after adjusting for covariates, the estimates for levels of care were similar (Supplementary Table S3).

Table 4 shows the results of logistic regression analyses examining parental posttraumatic stress and children's ineligibility for upper secondary education after having completed primary school. In the fully adjusted model, paternal posttraumatic stress was associated with an odds ratio (OR) of 1.37, 95% CI $[1.14, 1.65]$, that a child would not be eligible for upper secondary education. Maternal posttraumatic stress was associated with increased odds of upper-secondary education ineligibility after adjusting for sex and graduation year, OR = 1.25, 95% CI $[1.00, 1.55]$, but not in models that accounted for the effects of both confounding and potentially mediating variables, OR = 1.05, 95% CI $[0.88, 1.29]$. The results of logistic regression analyses did not reveal a significant association between parental posttraumatic stress and not having graduated by the end of the study period (Supplementary Table S4).

Table 3
Beta Coefficients of Z Scores of Grade Points Averages, by Parental Posttraumatic Stress Status

Variable	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d	
	Z score	95% CI	Z score	95% CI	Z score	95% CI	Z score	95% CI
No parent posttraumatic stress	0		0		0		0	
Paternal posttraumatic stress	-0.13	$[-0.21, -0.06]$	-0.12	$[-0.20, -0.04]$	-0.15	$[-0.22, -0.07]$	-0.14	$[-0.22, -0.07]$
Maternal posttraumatic stress	-0.15	$[-0.22, -0.07]$	-0.12	$[-0.20, -0.04]$	-0.11	$[-0.19, -0.03]$	-0.04	$[-0.13, 0.04]$
Both parents posttraumatic stress	-0.19	$[-0.35, -0.03]$	-0.23	$[-0.40, -0.08]$	-0.19	$[-0.35, -0.03]$	-0.18	$[-0.35, -0.02]$

Note. $N = 17,252$.

^a Adjusted for sex and graduation year. ^b Adjusted for parental educational attainment, country of origin income level, and all Model 1 covariates. ^c Adjusted for age when child received residence permit and all Model 1 and Model 2 covariates. ^d Adjusted for use of child psychiatry services; single parenthood; and all Model 1, Model 2, and Model 3 covariates.

Discussion

The present findings demonstrated that parental posttraumatic stress was associated with lower school performance in a regional cohort of children in refugee families. Although the impacts on children’s grade point average and eligibility for upper secondary school were moderate, these results demonstrate that intergenerational effects of psychological trauma include consequences for educational performance. School performance in Grade 9 has been robustly associated with a range of specific later-life mental health outcomes in Sweden, such as self-inflicted injuries (Jablonska et al., 2009), suicide (Bjorkenstam et al., 2011), alcohol-related disorders (Gauffin et al., 2015), and substance abuse (Gauffin et al., 2013). Hence, lower-than-average school performance is one pathway by which consequences of parental posttraumatic stress may impact mental health in their offspring. The present findings corroborate the importance of socioeconomic and migration-specific factors in relation to school performance in refugee families that have been identified in previous Scandinavian studies (Borsch et al., 2019). Having parents who originated in a low-income country, parents with a low level of educational attainment, and arriving in the new country at a later age (i.e., late school age) were associated with lower grades in the present study.

In studies that employ a cross-sectional design, such as the present study, reverse directional associations should always be considered. In the current study, reversed causality seems unlikely in Models 1, 2, and 3, whereas the adjustments for single-parent households and previous child psychiatric care in Model 4 are more problematic in this sense. Adjusting for these variables as confounders builds on the assumption that these factors are not caused by parental posttraumatic stress. However, symptoms associated with posttraumatic stress may be an important factor in intrafamilial conflict and family break-ups, such as when posttraumatic stress leads to family violence (Montgomery et al., 2019). It is also probable that parental posttraumatic stress is involved in the development of poor mental health in offspring, leading to the use of child psychiatry given that this connection has been well established among children of Holocaust survivors (Kellerman, 2001) and recently corroborated in refugee children in a Nordic context (Back Nielsen et al., 2019). However, an alternative explanation for the present finding of the connection between maternal posttraumatic stress and previous utilization of child psychiatric services is shared psychological trauma, which would make this factor a confounder rather than a mediator or moderator in the present analyses (Van IJzendoorn et al., 2003). Thus, Model 4 should be interpreted with caution, leaving open the possibility that the influence of paternal and maternal posttraumatic stress is quite similar, as suggested in Model 3. The different effect of adjustment for single parenthood and child psychiatric care, which lowered the effect estimates for maternal but not paternal posttraumatic stress, suggests that the family context is important in explaining intergenerational educational effects of psychological trauma (Barudy, 1989; Dalgaard et al., 2016). The fact that

Table 4
Odds Ratios (ORs) of Parental Posttraumatic Stress and Ineligibility for Secondary Education

Variable	Model 1 ^a		Model 2 ^b		Model 3 ^c		Model 4 ^d	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
No parent posttraumatic stress	1.00		1.00		1.00		1.00	
Father posttraumatic stress	1.25	[1.01, 1.54]	1.23	[0.99, 1.57]	1.37	[1.10, 1.70]	1.37	[1.14, 1.65]
Mother posttraumatic stress	1.25	[1.00, 1.55]	1.17	[0.96, 1.48]	1.20	[0.97, 1.48]	1.05	[0.88, 1.29]
Both parents posttraumatic stress	1.31	[0.93, 2.02]	1.41	[0.92, 2.08]	1.32	[0.90, 1.92]	1.32	[0.90, 1.94]

Note. N = 17,252.

^aAdjusted for sex and graduation year. ^bAdjusted for parental educational attainment, income level of country of origin, and all Model 1 covariates. ^cAdjusted for the age at which the child received a residence permit and all Model 1 and Model 2 covariates. ^dAdjusted for use of child psychiatry services; single parenthood; and all Model 1, Model 2, and Model 3 covariates.

shared traumatic experiences, potentially lead to mental health difficulties in children, are more common for mothers and their children than for fathers and their children, may contribute to this difference. It is also possible that this is a reflection of the more robust educational opportunities that men (i.e., fathers) tend to have in many of the families' countries of origin, potentially suggesting that the quality of paternal educational inspiration and support is particularly important for children's school performance. Further in-depth studies are needed to clarify the family dynamics behind this pattern.

The present study included posttraumatic stress–related diagnoses that were made in three levels of care. Unadjusted measures of impact on mean grade point averages were highest for children of parents treated at the tertiary level (i.e., Red Cross Centre for Tortured Refugees) and lowest when diagnoses were made in primary care; however, after adjusting for covariates, these differences disappeared. This could indicate that the setting in which refugee parents with posttraumatic stress symptoms are treated is quite random and, hence, the level of care might be a poor indicator of symptom severity in the context of the present study.

The consequences of parental posttraumatic stress on adolescents' school performance were smaller than expected with regard to findings from previous Swedish research on the intergenerational educational consequences of PTSD in the general Swedish-born population (Berg et al., 2019). Berg et al. found that the effect estimates on mean grade point averages in Swedish-born children in families with a non-European background were about twice those found in the present study. However, it should be noted that the prevalence rate of posttraumatic stress in many adult refugee populations has been found to be considerably higher than the 5%–6% found herein (Steel et al., 2009). Considering the well-established barriers to seeking psychiatric care in refugees (de Montgomery et al., 2020), it seems most likely that quite a few of the parents categorized as not having a posttraumatic stress–related diagnosis were misclassified. Furthermore, parents defined as suffering from posttraumatic stress in the present study asked for help from health care providers and received treatment, potentially making this a positively selected group of parents with posttraumatic stress symptoms.

In a previous study, Daud and Rydelius (2009) found lower IQ levels among children of patients treated at the Red Cross Centre for Tortured Refugees who originated in the Middle East, compared with age-matched children with a similar migrant background but no familial posttraumatic stress. In the present study, there was no association between parental posttraumatic stress and having no record of compulsory school graduation. No record of graduation indicates that the student repeated one or several courses and, therefore, did not graduate before the end of the follow-up period but may also indicate that the student was placed in a special education setting outside of mainstream education. The most common reason for such placement is an intellectual disability. Although our indicator was crude, our findings did not corroborate the findings

reported by Daud and Rydelius (2009) in this broader group of children. Further studies with better indicators of special education and intellectual deficiencies are needed to clarify this issue.

The strengths of the current study include the use of robust register data on migration, education, and family characteristics, with validated exposure of parental posttraumatic stress, that covered a large study population of refugees with minimal selection bias. Some of the key indicators used, such as parental posttraumatic stress diagnosed in health care settings, are proxy indicators with unknown precision, which may have led to the underestimation of the intergenerational educational consequences of parental posttraumatic stress. Another limitation was that the registers used do not include the particularly vulnerable refugee children in asylum-seeking and undocumented families (WHO, 2018). Finally, there are several indications that the context of the population in the present study was more favorable for educational success compared with most refugee children worldwide. The parents of the children in the study population were relatively well educated, with approximately 45% of the children having at least one parent with a university degree. Moreover, Sweden is a high-income country with an immigration policy that is ranked among the best in Europe (Dunlavy et al., 2020). Hence, the consequences of parental posttraumatic stress may be more pronounced in many other refugee populations.

The present results suggest that parental posttraumatic stress can have negative consequences on the school performance of their children. These and other previously documented intergenerational familial consequences of parental posttraumatic stress, such as family violence (Montgomery et al., 2019) and mental health problems (Back Nielsen et al., 2019), suggest that identifying and providing adequate treatment for posttraumatic stress should be an important part of the health care reception of newly settled refugee families. Furthermore, the present findings suggest that educational support should be considered an integral part of treatment for children in refugee families in which a parent has been given a posttraumatic stress–related diagnosis. Such support could be integrated into treatment and psychosocial support strategies for the family as well as offered at treatment centers for refugees and within regular psychiatric services.

Open Practices Statement

The study reported in this article was not formally preregistered. The data have not been made available on a permanent third-party archive, as the sharing of data is restricted by Swedish data protection laws, and administrative data are made available for specific research projects.

References

- Back Nielsen, M., Carlsson, J., Kjøster Rimvall, M., Petersen, J. H., & Norredam, M. (2019). Risk of childhood psychiatric disorders in children of refugee parents with posttraumatic stress disorder: A nationwide,

Parental PTSD and School Performance

- register-based, cohort study. *The Lancet Public Health*, 4(7), e353–e359. [https://doi.org/10.1016/S2468-2667\(19\)30077-5](https://doi.org/10.1016/S2468-2667(19)30077-5)
- Barudy, J. (1989). A programme of mental health for political refugees: Dealing with the invisible pain of political exile. *Social Science and Medicine*, 28(7), 715–727. [https://doi.org/10.1016/0277-9536\(89\)90219-0](https://doi.org/10.1016/0277-9536(89)90219-0)
- Beltran, R. O., Silove, D., & Llewellyn, G. M. (2009). Comparison of ICD-10 diagnostic guidelines and research criteria for enduring personality change after catastrophic experience. *Psychopathology*, 42(2), 113–118. <https://doi.org/10.1159/000204761>
- Berg, L., Charboti, S., Montgomery, E., & Hjern, A. (2019). Parental PTSD and school performance in 16-year-olds: A Swedish national cohort study. *Nordic Journal of Psychiatry*, 73(4–5), 264–272. <https://doi.org/10.1080/08039488.2019.1620852>
- Bierer, L. M., Bader, H. N., Daskalakis, N. P., Lehrner, A., Provencal, N., Wiechmann, T., Klengel, T., Makotkine, I., Binder, E. B., & Yehuda, R. (2020). Intergenerational effects of maternal Holocaust exposure on *FKBP5* methylation. *American Journal of Psychiatry*, 177(8), 744–753. <https://doi.org/10.1176/appi.ajp.2019.19060618>
- Bjorkenstam, C., Weitoft, G. R., Hjern, A., Nordstrom, P., Hallqvist, J., & Ljung, R. (2011). School grades, parental education, and suicide—a national register-based cohort study. *Journal of Epidemiology and Community Health*, 65(11), 993–998. <https://doi.org/10.1136/jech.2010.117226>
- Blackmore, R., Boyle, J. A., Fazel, M., Ranasingha, S., Gray, K. M., Fitzgerald, G., Misso, M., & Gibson-Helm, M. (2020). The prevalence of mental illness in refugees and asylum seekers: A systematic review and meta-analysis. *PLoS Med*, 17(9), e1003337. <https://doi.org/10.1371/journal.pmed.1003337>
- Borsch, A. S., de Montgomery, C. J., Gauffin, K., Eide, K., Heikkila, E., & Smith Jervelund, S. (2019). Health, education and employment outcomes in young refugees in the Nordic countries: A systematic review. *Scandinavian Journal of Public Health*, 47(7), 735–747. <https://doi.org/10.1177/1403494818787099>
- Bryant, R. A., Edwards, B., Creamer, M., O'Donnell, M., Forbes, D., Felmingham, K. L., Silove, D., Steel, Z., Nickerson, A., McFarlane, A., Van Hooff, M., & Hadzi-Pavlovic, D. (2018). The effect of posttraumatic stress disorder on refugees' parenting and their children's mental health: A cohort study. *The Lancet Public Health*, 3(5), e249–e258. [https://doi.org/10.1016/S2468-2667\(18\)30051-3](https://doi.org/10.1016/S2468-2667(18)30051-3)
- Dalgaard, N. T., Todd, B. K., Daniel, S. I., & Montgomery, E. (2016). The transmission of trauma in refugee families: Associations between intra-family trauma communication style, children's attachment security and psychosocial adjustment. *Attachment and Human Development*, 18(1), 69–89. <https://doi.org/10.1080/14616734.2015.1113305>
- Daud, A., & Rydelius, P. A. (2009). Comorbidity/overlapping between ADHD and PTSD in relation to IQ among children of traumatized/non-traumatized parents. *Journal of Attention Disorders*, 13(2), 188–196. <https://doi.org/10.1177/1087054708326271>
- DeVore, G. R. (2017). Computing the Z score and centiles for cross-sectional analysis: A practical approach. *Journal of Ultrasound in Medicine*, 36(3), 459–473. <https://doi.org/10.7863/ultra.16.03025>
- de Montgomery, C. J., Petersen, J. H., & Jervelund, S. S. (2020). Psychiatric healthcare utilisation among refugee adolescents and their peers in Denmark. *Social Psychiatry and Psychiatric Epidemiology*, 55(11), 1457–1468. <https://doi.org/10.1007/s00127-020-01878-w>
- Dunlavy, A., de Montgomery, C., Lorentzen, T., Malin, M., & Hjern, A. (2020). *Equity in education? A comparative analysis of educational outcomes among refugee and migrant-origin children in the Nordic countries.* (CAGE Project Report 1). University of Copenhagen. https://cage.ku.dk/publications/dokumenter/Equity_in_education__CAGE_report_2020.pdf
- Ekblom, A. (2011). The Swedish Multi-Generation Register. *Methods in Molecular Biology*, 675, 215–220. https://doi.org/10.1007/978-1-59745-423-0_10
- European Commission. (2020, December 14). *Quality assurance in early childhood and school education.* https://eacea.ec.europa.eu/national-policies/eurydice/content/quality-assurance-early-childhood-and-school-education-71_en
- Gauffin, K., Vinnerljung, B., Fridell, M., Hesse, M., & Hjern, A. (2013). Childhood socioeconomic status, school failure, and drug abuse: A Swedish national cohort study. *Addiction*, 108(8), 1441–1449. <https://doi.org/10.1111/add.12169>
- Gauffin, K., Vinnerljung, B., & Hjern, A. (2015). School performance and alcohol-related disorders in early adulthood: A Swedish national cohort study. *International Journal of Epidemiology*, 44(3), 919–927. <https://doi.org/10.1093/ije/dyv006>
- Hollander, A. C., Askegard, K., Iddon-Escalante, C., Holmes, E.A., Wicks, S., & Dalman, C. (2019). Validation study of randomly selected cases of PTSD diagnoses identified in a Swedish regional database compared with medical records: Is the validity sufficient for epidemiological research? *BMJ Open*, 9(12), e031964. <http://doi.org/10.1136/bmjopen-2019-031964>
- Jablonska, B., Lindberg, L., Lindblad, F., Rasmussen, F., Ostberg, V., & Hjern, A. (2009). School performance and hospital admissions due to self-inflicted injury: A Swedish national cohort study. *International Journal of Epidemiology*, 38(5), 1334–1341. <https://doi.org/10.1093/ije/dyp236>
- Kellerman, N. P. (2001). Psychopathology in children of Holocaust survivors: A review of the research literature. *Israel Journal of Psychiatry and Related Science*, 38(1), 36–46.
- Lin, A., Di Prinzio, P., Young, D., Jacoby, P., Whitehouse, A., Waters, F., Jablensky, A., & Morgan, V. A. (2017). Academic performance in children of mothers with schizophrenia and other severe mental illness, and risk for subsequent development of psychosis: A population-based study. *Schizophrenia Bulletin*, 43(1), 205–213. <https://doi.org/10.1093/schbul/sbw042>
- Ludvigsson, J. F., Almqvist, C., Edstedt Bonamy, A. -K., Ljung, R., Michaëlsson, K., Neovius, M., Stephansson, O., & Ye, W. (2016). Registers of the Swedish total population and their use in medical research. *European Journal of Epidemiology*, 31(2), 125–136. <https://doi.org/10.1007/s10654-016-0117-y>
- Ludvigsson, J. F., Svedberg, P., Olen, O., Bruze, G., & Neovius, M. (2019). The Longitudinal Integrated Database for Health Insurance and Labour Market Studies (LISA) and its use in medical research. *European Journal of Epidemiology*, 34(4), 423–437. <https://doi.org/10.1007/s10654-019-00511-8>
- Moller, L., Augsburg, M., Elklit, A., Sogaard, U., & Simonsen, E. (2020). Traumatic experiences, ICD-11 PTSD, ICD-11 complex PTSD, and the overlap with ICD-10 diagnoses. *Acta Psychiatrica Scandinavica*, 141(5), 421–431. <https://doi.org/10.1111/acps.13161>
- Montgomery, E., Just-Ostergaard, E., & Jervelund, S. S. (2019). Transmitting trauma: A systematic review of the risk of child abuse perpetrated by parents exposed to traumatic events. *International Journal of Public Health*, 64(2), 241–251. <https://doi.org/10.1007/s00038-018-1185-4>
- Reid, K., & Berle, D. (2020). Parental trajectories of PTSD and child adjustment: Findings from the Building a New Life in Australia study. *American Journal of Orthopsychiatry*, 90(2), 288–295. <http://doi.org/10.1037/ort0000434>
- Shalev, A., Liberzon, I., & Marmar, C. (2017). Posttraumatic stress disorder. *New England Journal of Medicine*, 376(25), 2459–2469. <https://doi.org/10.1056/NEJMra1612499>
- Steel, Z., Chey, T., Silove, D., Marnane, C., Bryant, R.A., & van Ommeren, M. (2009). Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and

- displacement: A systematic review and meta-analysis. *JAMA*, 302(5), 537–549. <https://doi.org/10.1001/jama.2009.1132>
- Szulkin, R., & Jonsson, J. (2007). *Ethnic segregation and educational outcomes in Swedish comprehensive schools* [Working Paper 2007:2]. The Stockholm University Linnaeus Center for Integration Studies. <https://www.diva-portal.org/smash/get/diva2:821406/FULLTEXT01.pdf>
- Taguma, M., Kim, M., Brink, S., & Teltemann, J. (2010). *OECD reviews of migrant education*. Sweden: Organisation for Economic Co-Operation and Development. <https://www.oecd.org/sweden/44862803.pdf>
- Torslev, M. K., & Rothe Borsch, A. S. (2017). *Refugee and immigrant children's right to education: A comparative analysis of education policies targeting immigrant children in the Nordic countries*. (CAGE Policy Report 2). University of Copenhagen. https://cage.ku.dk/publications/reports/CAGE_Policy_Report_2.pdf
- United Nations High Commissioner for Refugees. (2019). *Global trends. Forced displacement in 2019*. <https://www.unhcr.org/statistics/unhcrstats/5ee200e37/unhcr-global-trends-2019.html>
- van Ee, E., Jongmans, M. J., van der Aa, N., & Kleber, R. J. (2017). Attachment representation and sensitivity: The moderating role of posttraumatic stress disorder in a refugee sample. *Family Process*, 56(3), 781–792. <https://doi.org/10.1111/famp.12228>
- van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Sagi-Schwartz, A. (2003). Are children of Holocaust survivors less well-adapted? A meta-analytic investigation of secondary traumatization. *Journal of Traumatic Stress*, 16(5), 459–469. <https://doi.org/10.1023/A:1025706427300>
- World Bank. (2017). *World Bank list of economies*. <http://iccmoot.com/wp-content/uploads/2017/07/World-Bank-List-of-Economies.pdf>
- World Health Organization. (2018). *Health of refugee and migrant children. Technical guidance*. World Health Organization Regional Office for Europe.
- World Health Organization. (2019). *International statistical classification of diseases and related health problems* (10th ed.). <https://icd.who.int/browse10/2019/en>
- World Health Organization. (2021). *International statistical classification of diseases and related health problems* (11th ed.). <https://icd.who.int/browse11/l-m/en>