Parental trajectories of PTSD and child adjustment: Findings from the Building a New Life in

Australia Study

Kyla Reid[1] & David Berle[1,2]

1. Discipline of Clinical Psychology, University of Technology Sydney, Sydney, Australia.

2. School of Psychiatry, University of New South Wales, Sydney, Australia.

Word count: 3779 (excl. references, tables & figures)

* Address for correspondence:

David Berle
Discipline of Clinical Psychology
Graduate School of Health
Vicki Sara Building
University of Technology Sydney
67 Thomas Street
Ultimo NSW 2007
Australia
Email: david.berle@uts.edu.au
Ph: +61 2 9514 4278

Abstract

Aims. Evidence suggests that the psychosocial adjustment of children of refugees may be compromised when a parent has symptoms of posttraumatic stress disorder (PTSD). We sought to determine whether trajectories of parental PTSD symptoms might relate to child adjustment and whether there is an additive effect when both, as opposed to just one parent, has prominent PTSD symptoms. **Method.** We report data from the first three years of a prospective study of recent Australian humanitarian migrants: the *Building a New Life in Australia* study. Parental PTSD symptoms were assessed on three occasions and Latent Class Growth Analysis was used to identify homogenous groups of parents based on their PTSD symptoms. The Strength and Difficulties Questionnaire was administered to assess child psychosocial adjustment. Regression analyses were then conducted to determine whether trajectories of parental PTSD symptoms predicted child adjustment. **Results.** After controlling for child age and gender, the presence of either one or both parents with persistently high PTSD symptoms was associated with children having greater emotional difficulties and poorer overall psychosocial adjustment. Children with both parents with persistently high PTSD had higher levels of emotional difficulties than children with a single parent with high PTSD symptoms. **Conclusion.** For emotional difficulties, though not other domains of child psychosocial adjustment, there indeed appears to be an "additive" impact of having two, rather than just one parent with persistently high PTSD symptoms, although the magnitude of these effects was small. The clinical and service provision implications of these findings are discussed.

Public Policy Relevance

High levels of posttraumatic stress disorder (PTSD) symptoms are common in refugees following exposure to potentially traumatic events in their country of origin or during the migration process. Within family units, the ways in which the course of parental PTSD symptoms are associated with child psychosocial adjustment are not well understood, especially when both parents, as opposed to just one, have prominent symptoms of PTSD. Our study suggests that children with a parent with persistently high PTSD symptoms are likely to have poorer emotional and overall psychosocial adjustment, with this being compounded when both parents have persistently high PTSD symptoms.

Of the 68.5 million individuals forcibly displaced from their homes during 2017, 25.4 million were refugees, and over half were under the age of 18 (UNCHR, 2019). Given that many refugees will be migrating as family units, there is a need to better understand the interplay between persistent parental psychological health post-settlement and child psychosocial adjustment.

For some adult refugees, exposure to potentially traumatic events (PTE) and persecution in their country of origin and/or during their migration journey can result in persistently high levels of posttraumatic stress disorder (PTSD) symptoms (Hauff & Vaglum, 1994; Silove et al., 2007). This persistence of PTSD in the resettlement environment not only impacts on resettlement stress for adult refugees, but may impact on the wellbeing of their children (Almqvist & Broberg, 1999; Pumariega et al., 2005).

Many children of refugees find themselves having higher exposure to stressful home environments if one or both parents has PTSD. The high level of dislocation and acculturation challenges associated with resettlement can result in higher levels of reliance of children on their parents as primary caregivers and social supports across the resettlement period (Khamis, 2016; Fazel & Stein, 2002).

A number of studies have investigated the adjustment of children of refugees who have mental health symptoms. Among US refugees from South East Asia, maternal traumatic stress was associated with greater depressive symptoms, antisocial behaviour, school problems and delinquency in children (Sangalang, et al., 2017). Maternal PTSD symptoms have also been found to be related to

increased child anxiety (Field et al., 2013). In an Australian refugee sample, the primary caregiver's severity of PTSD was found to be associated with poorer child adjustment including a higher prevalence of conduct, hyperactivity, emotional and peer problems (Bryant et al., 2018). Khamis (2016) studied refugee families settled in the U.S from the Gaza strip and found that when the influence of parent's psychological distress was controlled for, children's direct exposure to traumatic experiences was no longer associated with psychological difficulties.

A limitation of the above research is that the studies only focused on the effect of PTSD symptoms in mothers or primary caregivers on child adjustment, such that the potential additive effect of having both parents with symptoms of PTSD remains unclear. Additionally, the majority of research in this area has not investigated the longitudinal trajectories of parental PTSD symptoms, leaving open the question of how the prospective course of PTSD symptoms may be associated with child adjustment. Child outcomes might be particularly unfavorable when both parents endorse greater levels of PTSD symptoms as Lambert et al. (2014) found that both maternal and paternal PTSD was an important factor in child psychological adjustment.

It remains unclear to what extent PTSD symptoms among one or both parents from a refugee background is associated with compromised psychosocial adjustment in children and how the prospective course of parental symptoms might predict child adjustment. The current study therefore aimed to examine the relationship between the nature and course of parental PTSD and the association of this with child adjustment, and particularly whether child mental health is worse among children when both parents have PTSD compared to when one

parent has PTSD. Improving our understanding of these relationships may help health practitioners better identify "at risk" children and adolescents and to prioritize access to care.

It was hypothesized that adult PTSD trajectories that are associated with the persistence of "high levels" of parental PTSD symptomology in one parent will lead to less favorable psychosocial outcomes for refugee children. Secondly, it was hypothesised that the persistence of "high levels" of parental PTSD symptomology in both parents will have a "compounding" effect whereby the psychosocial adjustment of children in these families will be particularly unfavorable.

Method

We used unit record data from the first three waves of the Building a New Life in Australia (BNLA) study. The BNLA study is a prospective population based survey aimed at investigating the factors influencing post-arrival adjustment of newly arrived humanitarian migrants in Australia to help guide policy development and service provisions (Chen et al., 2017; Edwards et al., 2018). Participants were recruited from 11 sites around Australia where the largest numbers of humanitarian migrants were settling.

Eligible participants were primary applicants of humanitarian visas which were awarded before their migration to Australia. They were 18 years of age or older and had arrived in Australia 3 – 6 months before their first wave interview. Visa holders who had obtained their humanitarian visas following arrival in Australia were also eligible, provided that a permanent protection visa was

granted 3 – 6 months prior to their first wave interview and they were 18 years of

age or older. Participants identified to be eligible to participate in the BNLA study

at wave 1 included 2399 primary applicants, or 1509 migrating units. Of the 2399

participants, 1894 (79%) were retained at Wave 3.

Survey materials were translated into 14 different languages and trained

interpreters were used when necessary. Ethics approval was obtained from the

Australian Institute of Family Studies Human Research Ethics Committee for the

BNLA study, and local approval for the present secondary analyses was obtained

from the [Blinded for review] Ethics Committee.

Questionnaires

The Post-Traumatic Stress Disorder–8 item scale (Hansen et al., 2010)

was derived from the Harvard Trauma Questionnaire to measure for PTSD

symptoms among refugees. Symptoms during the past week are rated from 1 (not

at all) through to 4 (most of the time) with total scores ranging 8 to 32. The

PTSD-8 has been shown to have sound convergent validity and test-retest

reliability (Hansen et al., 2010).

The Strengths and Difficulties Questionnaire (SDQ; 25-items; Goodman,

2001) was administered to primary caregivers (parent report) to complete at Wave

3. The SDQ assesses child psychosocial adjustment (internalizing and

externalizing problems) across five domains: conduct problems, hyperactivity

problems, emotional problems, peer problems and pro-social behavior. For a

measure of *total difficulties* (range 20-60) the conduct, hyperactivity, emotional

and peer problems subscales are summed together. Parents were asked to reflect

on their children(s) behaviour over the previous 6 months and rate each item in

the SDQ on a scale from 1 (not true) to 3 (certainly true). The SDQ has been

validated in non-western populations (Goodman et al., 2000; Mullick &

Goodman, 2001).

Procedure

Data collection occurred annually, with the first wave of data being

collected between October 2013 and March 2014. For a detailed summary of the

methods see Edwards et al. (2018).

The PTSD-8 was administered at each wave of data collection and primary

caregivers were administered the SDQ at Wave 3. Children of caregivers were

grouped into two age groups: The younger age group consisted of 5 to 10 year

olds, and the older age group consisted of 11 to 17 year olds. These age groups

were chosen on the basis that 11 to 17 year olds were also considered able to

provide their own self-report ratings, although we note that the present analyses

rely solely on parent ratings. Children in the older age group were preferentially

selected for parents to report on over the younger children. If families had one

child aged between 11 and 17 years old and multiple children in the younger age

group, parents were asked to complete measures on the older child ("Child 1"),

and then a younger child would randomly be selected ("Child 2"). If all children

were aged between 11 and 17 or 5 and 10 years old, two of the children were

randomly selected.

As we also aimed to investigate the extent to which *both* parent's

experience of PTSD symptoms resulted in poorer child adjustment, we extracted

principal applicants who had permanent partners across all three waves of data

collection. This was to avoid the confound of parental relationships that were only

brief or transient in nature. Of the 1894 participants retained at Wave 3, 269 pairs

of partners who were also parents and included a male (father) and female

(mother) were identified (see Supplementary Figure 1 for summary). We report

findings for "mothers" and "fathers" of heterosexual parent relationships, given

that only two relationship pairs were non-heterosexual. To reduce the risk that

parent pairs were only engaged in short-term relationships, we only analysed

couples who remained together across all three waves of assessment. To ensure

that each parent had regularity of interactions with their child(ren), we also only

analysed parental couples who were living together across all three waves.

Data analysis

Participants who were missing data on key dependent variables at all three

assessment waves were removed prior to analysis ($n = 16$). For the remaining

participants, the expectation maximization algorithm (Graham, 2009) was used to

estimate missing values given that data appeared to be missing completely at

random (Little's MCAR test $\chi^2 = 140.85$, $df = 392$, $p > 0.05$).

Latent Class Growth Analysis (LCGA) was conducted using Mplus

Version 7.31 (Muthén & Muthén, 2010) to identify homogenous longitudinal

patterns of PTSD symptoms (PTSD-8) among parents of a refugee background

over three years post settlement. LCGA is a model-based approach to group

individuals into trajectory classes. Models were estimated based on

recommendations outlined in Jung & Wickrama (2008). A series of models

specifying respectively greater numbers of classes were specified. The optimal

number of trajectory classes was then determined using the Bayesian Information

Criterion (BIC; Schwartz, 1978), Akaike's Information Criterion (AIC; Akaike,

1987), entropy (classification quality; Ramaswamy et al., 1993) and the Lo,

Mendell & Rubin likelihood ratio test (LMRLRT; Lo et al., 2001). Lower values

of AIC, BIC and higher entropy indicate better fit (Geiser, 2013). Entropy ranges

from 0 to 1 with values closer to 1 indicating better classification accuracy

(Ramaswamy et al., 1993). The LMR-LRT is used to compare the improvement in

model fit from one class to the next. A significant LMR-LRT shows that the

subsequent class model improves significantly upon the preceding class model. In

addition to fit indices, Jung & Wickrama (2008) also highlight the importance of

parsimony and interpretability when determining the number of classes. After the

LCGA model of best fit was decided upon, parents were assigned to their most

likely class based on model probabilities in SPSS.

Once each parent was assigned a trajectory class membership, a single

variable was created to indicate the class membership of each parent pair (e.g.,

both high PTSD or both low etc). We then conducted linear regression analyses to

determine the associations between parental PTSD and child social, emotion and

behavioural adjustment as measured by the SDQ. Dependent variables included

SDQ total difficulties, emotional problems, conduct problems, hyperactivity

problems and peer problems. In addition to parental PTSD trajectory, child gender

and age were also added as potential covariates in block 1 of the model.

Results

Descriptive Statistics

Of the 542 parents in the sample (*n* = 271 parent pairs), two of the parent

pairs were of the same gender and so removed from the analysis to ensure

consistent parental gender effects for our analyses. Most parents came from Iraq

($n = 324$, 60.2%) and Afghanistan ($n = 82$, 15.2%). The demographic

characteristics for the 538 parents for whom PTSD symptom trajectories were

analysed are summarised in Supplementary Table 1.

Of the 269 parent pairs, only 261 were used for child-related analyses, due

to missing SDQ data for eight children. Of the children included for analysis in

the current study ($n = 261$), 140 were male (53.6%) and 169 (64.8%) were

between the ages of 11 and 17 (Table 1).

Latent class growth Analysis for PTSD

Table 2 summarises the fit statistics for the seven different trajectory class

solutions (one through to seven) for parental PTSD symptoms. For Fathers, a four

class solution provided the best fit to the data based on the LMRLRT and reduced

rate of decrease for BIC values for classes 4 to 5. The classes could best be

described as "Improvers" (34.9%), "Persistent mid-range PTSD" (21.8%),

"Persistent high PTSD" (31.4%) and "Persistent very high PTSD" (11.9%). The

left panel of Figure 1 shows the four-class PTSD symptom trajectories for

Fathers. Given that relatively few fathers fell within the "Persistent very high

PTSD" class (11.9%), the Persistent high and Persistent very high PTSD groups

for Fathers were collapsed for all subsequent analyses.

For Mothers, a two-class solution, "Persistent low PTSD" (81.2%) and

"Persistent high PTSD" (18.8%) appeared to provide the best fit to the data based

on the LMRLRT and a lowest BIC value for a two-class solution (5167.27). The

right panel of Figure 1 shows the two-class PTSD symptom trajectories for

Mothers.

Association between parental PTSD and children's social, emotional and behavioural adjustment

Linear regression analyses were conducted to determine whether parent dyad PTSD trajectory class membership predicted children's scores on SDQ total difficulties, emotional problems, conduct problems, hyperactivity problems, peer problems and prosocial functioning respectively. Given that parental PTSD symptoms might have differential associations with child adjustment depending on the age and gender of the child, child gender and age category were included as covariates in all regression analyses. Analyses pertaining to the eldest child refer to "Child 1", analyses referring to the younger child refer to "Child 2".

Regression analyses were conducted for the following comparisons of Fathers and Mothers:

1. Father *or* Mother persistent high PTSD symptoms trajectory class compared to both Father *and* Mother in the persistently low PTSD symptom trajectory class (reference group). These analyses indicate whether having *either* parent with persisting high PTSD symptoms is associated with elevated SDQ scores in children when compared to children who have neither parent with persistently high PTSD symptoms.

2. Father and Mother both have persistently high PTSD symptom trajectories compared to both Father and Mother in the persistently low symptom trajectory class (reference group). This comparison would indicate whether there are elevated SDQ scores among children of

parents where both parents have persistently elevated PTSD
symptoms.

3. Father and Mother have persistently high PTSD symptom trajectories
    compared to either Fathers or Mothers having persistently high PTSD
    symptom trajectories. These analyses would indicate whether there is
    an additive effect of having both compared to just one parent with
    persistently elevated PTSD symptoms.

We repeated the above analyses for the secondary child (Child 2) when present. The results of these analyses are included as Supplementary Tables given the smaller number of second children and reduced statistical power for those analyses.

The first set of regressions, summarised in Table 3, compare children where either parent was found to be within the high PTSD symptom trajectory class with those children where both parents belonged to the low PTSD symptom trajectories class. Both SDQ Total and Emotional Difficulties scores were significantly elevated among children where one parent was found to belong to the persistently high PTSD trajectory class (ps = 0.02 and 0.0012 respectively). We note that 2.8% and 4.1% would correspond to small size correlation co-efficients (r = 0.17 & 0.20 respectively) according to Cohen's (1992) conventions for effect size.

For the second set of regressions, summarised in Table 4, both SDQ Total and Emotional Difficulties scores were significantly greater in children who had two parents within the high PTSD symptom trajectory class when compared to children who had two parents with low PTSD symptom trajectories (ps = 0.018

and 0.0028 respectively). These analyses accounted for 5.5% and 8.9% of the

variance in Child 1 SDQ scores respectively, corresponding to small (r = 0.23)

and medium size (r = 0.30) effects respectively.

The third set of regressions (Table 5) compared children where both

Father and Mother have persistent high PTSD symptoms vs either Father and

Mother alone having high level PTSD symptoms. SDQ Emotional Difficulties,

but not Total Difficulties or any other SDQ subscale, were significantly greater in

children who had both, as opposed to either parent in the high PTSD trajectory

class (p = 0.028). However, the regression predicting SDQ Emotional Difficulties

only explained a small amount of the variance in the model (1.9%), equivalent to

a correlation of 0.14.

Supplementary Tables 4-5 summarize the findings when these regressions

were repeated for the "Child 2" participants.

Discussion

A strength of the BNLA study was the prospective assessment of parental

PTSD across a three-year interval. Given that many refugees report improvements

in psychological symptoms following arrival in their host country (Westermeyer

et al., 1989), investigating the relationships between the longitudinal trajectories

of parental PTSD symptoms and childhood functioning holds particular value,

especially if the negative effects on children might arise only after an extended

period of parental difficulties. We found that between 20% and 33% percent of

refugees were identified within the persistently high PTSD symptom class across

the three-year survey period. This finding is consistent with prior research

documenting high rates of PTSD (Hauff & Vaglum, 1994; Marshall et al., 2005) but establishes for the first time the persistently severe trajectory PTSD class within family groups.

A second key finding related to the association between parental PTSD and child mental health. Our results suggest that having one parent with persistently higher levels of PTSD symptoms is associated with unfavourable adjustment in children's emotional and overall psychosocial functioning. This supports our first hypothesis, although we note that the association was small in magnitude. Previous cross-sectional research has found that parental PTSD is associated with child emotional and behavioural adjustment (Daud et al., 2005; Khamis, 2016), as well as overall adjustment in the case of children of refugees (Dalgaard et al., 2016; Eruyar et al., 2018; Fazel & Stein, 2002; Lambert et al., 2014). Our study extends these findings by demonstrating that it is specifically a *persistence* of high PTSD symptoms in either parent that is associated with emotional and overall psychosocial difficulties. It is possible then, that previous cross-sectional findings reporting this association may have reflected SDQ symptoms which may only have emerged after a prolonged period of PTSD-related difficulties for the parent. Further studies should aim to better understand these prospective relationships, perhaps by additionally assessing SDQ scores across time.

A similar pattern of findings emerged when we compared children with both parents with persistently high PTSD with children who had both parents persistently low on PTSD symptoms. Again, both emotional and total psychosocial difficulties were elevated among children who had two parents with

persistently high levels of PTSD symptoms, the small magnitude of the

association notwithstanding.

    Our findings are of particular importance in establishing an additive effect

of having both parents with persistently high PTSD symptoms, as opposed to just

one. In this respect, only the SDQ emotional difficulties subscale demonstrated

such an additive effect when two, rather than just one parent, were persistently

high on PTSD symptoms. In contrast to children with just one parent with

persistently elevated PTSD symptoms, children who have both parents with

persistently elevated PTSD may have been exposed to consistent maladaptive

modelling of hypervigilance-related behaviors and dysregulated affect, potentially

priming elevated threat expectancies and emotional difficulties in the children

themselves. Importantly, these elevated emotional difficulties in children may be

less evident to clinicians, caregivers and teachers than difficulties in other

respects, such as compromised peer relationships, misconduct or hyperactivity.

    It is noteworthy that our significant findings were confined to the domains

of emotional difficulties as well as total psychosocial difficulties: other domains

of child SDQ scores were not significantly different when comparing various

pairings parental PTSD trajectory classes. Given that emotional difficulties as

assessed by the SDQ incorporate ways of responding to stress which could

broadly be described as "internalizing" (Goodman et al., 2010) our findings have

particular implications for interventions which might target internalizing

symptoms, as opposed to either "externalizing" symptoms of conduct problems

and hyperactivity, or social difficulties as reflected by the peer problems and

prosocial behaviours subscales of the SDQ. Thus, the interpersonal supports of

these children may in fact remain strong in spite of family stress and potentially

serve a protective function.

There are a number of important implications of these findings. A clear

implication is that services that are oriented to providing specialist refugee

support services to adults need to be mindful of the obligation to identify and

provide support to "at risk" children through close examination of childhood

adjustment for children of families where one or both parents have PTSD. Our

finding that emotional problems were particularly evident in children of parents

with persisting PTSD highlights internalizing behaviors as an area of particular

potential focus. Additionally the findings suggest that there may be indirect and

secondary benefits for children when their parents receive help for PTSD.

The current findings should be considered alongside the study's

limitations. First, we were not able to control for child exposure to trauma or child

PTSD symptoms, thus we are unable to determine whether childhood difficulties

were the result of an interplay between parental symptoms and typical child

adjustment or, instead, a product of third factors such as exposure to trauma in the

child or the whole family unit. Second, in instances where both parents reported

high PTSD symptom trajectories, we were not able to determine whether the

symptoms of each parent resulted from shared or distinct traumatic experiences.

Third, there was insufficient statistical power for us to be able to analyze data for

single parent families. Fourth, we relied on the parent reported SDQ measure, thus

not allowing a comparison of perspectives between adolescents and their parents

on adjustment. While parent ratings on the SDQ have been validated across

contexts (Biel et al., 2012; Bourdon et al., 2005), it is possible that parents who

were experiencing high levels of psychological symptoms themselves may have also perceived their children as being more symptomatic. We also note thatthe methodology of the study precluded us from choosing a child at random within each family, thus, the results may be biased by a proportionately greater number of first-born children were included in our analyses. Finally, we note that the magnitude of the significant effects was typically small. Thus, while these associations were evident in a large sample and may inform the need for services at the population level, our findings do not necessarily suggest that meaningful deficits in psychosocial adjustment can be assumed when considering any individual child or family unit.

Our study thus highlights the different trajectories of PTSD recovery among caregivers within resettled refugee families. Of particular importance is the association between persisting parental PTSD symptom trajectories and unfavorable emotional and overall adjustment in children. Children where both parents had persisting high-level PTSD symptom trajectories were at the highest risk and should be a particular focus for intervention programs with the knowledge that such intervention may have benefits for children as well. There is a need for continued research to improve our understanding of the factors and mechanisms that hinder child adjustment in this population to help guide policy development and service provisions to mitigate these effects.

References

Akaike, H. (1987). Factor analysis and AIC. *Psychometrika*, *52*, 317–332. doi: 10.1007/978-1-4612-1694-0_29

Almqvist, K., Broberg, A. (1999). Mental health and social adjustment in young refugee children 3 1/2 years after their arrival in Sweden. *Journal of the American Academy of Child and Adolescent Psychiatry*, *38*, 723–730. doi: 10.1097/00004583-199906000-00020

Biel, M. G., Kahn, N. F., Srivastava, A., Mete, M., Banh, M., Wissow, L. S., Anthony, B. J. (2012). Parent Reports of Mental Health Concerns and Functional Impairment on Routine Screening With the Strengths and Difficulties Questionnaire. *Academic Pediatrics*, *15*, 412-420. doi: 10.1016/j.acap.2015.01.007

Bourdon, K. H., Goodman, R., Rae, D. S., Simpson, G., Koretz, D. S. (2005). The Strengths and Difficulties Questionnaire: U.S. normative data and psychometric properties. *Journal of the American Academy of Child and Adolescent Psychiatry*, *44*, 557–564. doi: 10.1097/01.chi.0000159157.57075.c8

Bryant, R. A., Edwards, B., Creamer, M, O'Donnell, M., Forbes, D., Felmingham, K. L., … Hadzi-Pavlovic, D. (2018). The effect of post-traumatic stress disorder on refugees' parenting and their children's mental health: a cohort study. *Lancet Public Health*, *3*, e249–e258. doi: 10.1016/S2468-2667(18)30051-3

Chen, W., Hall, B. J., Ling, L., Renzaho, A. M. N. (2017). Pre-migration and post-migration factors associated with mental health in humanitarian

migrants in Australia and the moderation eff ect of post-migration stressors :

findings from the first wave data of the BNLA cohort study. *Lancet*

Psychiatry, *4*, 218–229. doi: 10.1016/S2215-0366(17)30032-9

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*:69-89.

doi: 10.1080/14616734.2015.1113305

Daud, A., Skoglund, E., Rydelius, P. A. (2005). Children in families of torture

victims: Transgenerational transmission of parents' traumatic experiences to

their children. *International Journal of Social Welfare*, *14*, 23–32. doi:

10.1111/j.1468-2397.2005.00336.x

Edwards, B., Smart, D., De Maio, J., Silbert, M., Jenkinson, R. (2018). Cohort

profile: Building a new life in Australia (BNLA): The longitudinal study of

humanitarian migrants. *International Journal of Epidemiology*, *47*, 20–20h.

doi: 10.1093/ije/dyx218

Eruyar, S., Maltby, J., Vostanis, P. (2018). Mental health problems of Syrian

refugee children: the role of parental factors. *European Child & Adolescent*

Psychiatry, *27*, 401–409. doi: 10.1007/s00787-017-1101-0

Fazel, M., Stein, A. (2002). The mental health of refugee children. *Archives of*

Disease in Childhood, 87, 366-370. doi: 10.1136/adc.87.5.366

Field, N. P., Muong, S., Sochanvimean, V. (2013). Parental Styles in the

Intergenerational Transmission of Trauma Stemming From the Khmer

Rouge Regime in Cambodia. *American Journal of Orthopsychiatry*, *83*, 483–

494. doi: 10.1111/ajop.12057

Geiser, C. (2013). *Data analysis with MPlus*. New York: NY: Guilford Press.

Goodman R, Ford T, Simmons H, Gatward R, Meltzer H (2000). Using the
Strengths and Difficulties Questionnaire (SDQ) to screen for child
psychiatric disorders in a community sample. *British Journal of
Psychiatry*, *177*, 534–539. doi: 10.1192/bjp.177.6.534

Goodman, R. (2001). Psychometric properties of the strengths and difficulties
questionnaire. *Journal of the American Academy of Child and Adolescent
Psychiatry*, *4*, 1337–1345. doi: 10.1097/00004583-200111000-00015

Goodman, A., Lamping, D. L., Ploubidis, G. B. (2010). When To use broader
internalising and externalising subscales instead of the hypothesised five
subscales on the Strengths and Difficulties Questionnaire (SDQ): Data
from British parents, teachers and children. *Journal of Abnormal Child
Psychology, 38*, 1179-1191. doi: 10.1007/s10802-010-9434-x

Graham, J. W. (2009). Missing data analysis: Making it work in the real world.
Annual Review of Psychology, *60*, 549–576. doi:
10.1146/annurev.psych.58.110405.085530

Hansen, M., Andersen, T. E., Armour, C., Elklit, A., Palic, S., Mackrill, T. (2010).
PTSD-8: a short PTSD inventory. *Clinical Practice and Epidemiology in
Mental Health*, *6*, 101–108. doi: 10.2174/1745017901006010101

Hauff, E., Vaglum, M. D. (1994). Chronic Posttraumatic Stress Disorder in
Vietnamese Refugees: A Prospective Community Study of Prevalence,
Course, Psychopathology, and Stressors. *Journal of Nervous & Mental
Disease, 182*, 85–92. doi: 10.1097/00005053-199402000-00004

Jung, T., Wickrama, K. A. (2008). An introduction to latent class growth analysis

and growth mixture modeling. *Social and Personality Psychology Compass*,

2, 302–317. doi: 10.1111/j.1751-9004.2007.00054.x

Khamis, V. (2016). Does parent's psychological distress mediate the relationship

between war trauma and psychosocial adjustment in children? *Journal of

Health Psychology*, *21*, 1361–1370. doi: 10.1177/1359105314553962

Lambert, J. E., Holzer, J., Hasbun, A. (2014). Association Between Parents'

PTSD Severity and Children's Psychological Distress: A Meta-Analysis.

Journal of Traumatic Stress, *27*, 9–17. doi: 10.1177/1359105314553962

Lo, Y., Mendell, N. R., Rubin, D. (2001). Testing the Number of Components in a

Normal Mixture. *Biometrika*, *88*, 767–778. doi: 10.1093/biomet/88.3.767

Marshall, G. N., Schell, T. L., Elliot, M. N., Berthold, M., Chun, C-A. (2005).

Mental Health of Cambodian refugees 2 decades after resettlement in the

United States. *JAMA, 294*, 571–579. doi: 10.1001/jama.294.5.571

Mullick, M., Goodman, R. (2001). Questionnaire screening for mental health

problems in Bangladeshi children: a preliminary study. *Social Psychiatry

and Psychiatric Epidemiology*, *36*, 94–99. doi: 10.1007/s001270050295

Muthén, L. K., Muthén, B. O. (2010). *MPlus User's Guide* (Seventh Ed). Los

Angeles: CA: Muthén & Muthén.

Pumariega, A. J., Rothe, E., Pumariega, J. B. (2005). Mental Health of

Immigrants and Refugees. *Community Mental Health Journal*, *41*, 581–597.

doi: 10.1007/s10597-005-6363-1

Ramaswamy, V., Desarbo, W. S., Reibstein, D. J., Robinson, W. T. (1993). An

empirical pooling approach for estimating marketing mix elasticities with

pims data. *Marketing Science*, *12*, 103–124. doi: 10.1287/mksc.12.1.103

Sangalang, C. C., Jager, J., Harachi, T. W. (2017). Social Science & Medicine
Effects of maternal traumatic distress on family functioning and child mental
health : An examination of Southeast Asian refugee families in the U.S.
Social Science & Medicine, *184*, 178–186. doi:
10.1016/j.socscimed.2017.04.032

Schwartz, G. (1978). Estimating the dimension of a model. *The Annals of
Statistics*, *6*, 461–464. doi: 10.1214/aos/1176344136

Silove, D., Steel, Z., Bauman, A., Chey, T., McFarlane, A. (2007). Trauma, PTSD
and the longer-term mental health burden amongst Vietnamese refugees: A
comparison with the Australian-born population. *Social Psychiatry and
Psychiatric Epidemiology*, *42*, 467–476. doi: 10.1007/s00127-007-0194-z

Stone, L., Otten, R., Engels, R., Vermulst, A., Janssens, J. (2010). Psychometric
properties of the parent and teacher versions of the strengths and difficulties
questionnaire for 4- to 12-year-olds: a review. *Clinical Child Family
Psychology Review*, *13*, 254–274. doi: 10.1007/s10567-010-0071-2

United Nations High Commissioner for Refugees (UNHCR). Figures at a
glance. https://www.unhcr.org/en-au/figures-at-a-glance.html. Published
2019. Accessed May 3, 2019.

Westermeyer, J., Neider, J., Callies, A. (1989). Psychosocial adjustment of
Hmong refugees during their first decade in the United States: A
longitudinal study. *Journal of Nervous and Mental Disease*. *177*, 132-139.
doi: 10.1097/00005053-198903000-00002

Table 1

Table 1. Demographics and Strengths and Difficulties Questionnaire (SDQ) scores children at Wave 3.

	Child 1* (n = 261)		Child 2 (n = 160)	
	n	%	*n*	%
Gender				
Male	140	53.6	75	46.9
Age				
5-11 years	92	35.2	69	43.1
11-17 years	169	64.8	91	56.9
Parent-rated SDQ score				
	Mean	*SD*	Mean	*SD*
Emotional problems	7.19	1.98	6.94	1.96
Conduct problems	6.34	1.55	6.38	1.71
Hyperactivity problems	7.87	2.02	8.12	2.27
Peer problems	7.26	1.37	7.15	1.40
Prosocial behaviour	13.16	2.11	13.17	2.22
SDQ Total difficulties	28.67	5.23	28.59	5.59

* Child 1 was the eldest child of each family.

Table 2. Incremental fit statistics and classification accuracy for latent class growth model for PTSD-8 total scores.

Number of classes	Father						Mother					
	LL	AIC	BIC	Entropy	LMRLRT	LMRLRT p-value	LL	AIC	BIC	Entropy	LMRLRT	LMRLRT p-value
1	-2753.22	5516.45	5534.42	-	-	-	-2623.74	5257.49	5275.46	-	-	-
2	-2621.11	5258.22	5286.97	0.85	264.23	<0.001	-2561.26	5138.52	5167.27	0.80	124.97	<0.001
3	-2598.15	5218.30	5257.84	0.81	45.92	<0.001	-2554.59	5131.17	5170.71	0.59	13.35	0.04
4	-2576.13	5180.26	5230.59	0.91	44.04	0.002	-2550.94	5129.87	5180.20	0.66	7.30	0.59
5	-2564.14	5162.28	5223.39	0.90	23.99	0.26	-2525.26	5084.53	5145.64	0.91	19.62	0.18
6	-2553.13	5146.25	5218.15	0.90	22.02	0.004	-2519.65	5079.30	5151.19	0.89	11.23	0.66
7	-2540.44	5126.88	5209.56	0.88	25.37	0.17	-2513.12	5072.25	5154.92	0.89	11.61	0.38

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; LL = Loglikelihood; LMRLRT = Lo-Mendell Rubin Likelihood ratio test.

Table 2

Table 3

Table 3. Regressions predicting SDQ scores for Child 1, where Father or Mother have persistently high PTSD symptoms vs both Father and Mother have persistently low-level PTSD symptoms.

Dependent variable				95% CI	
Predictor variable	B	SE B	β	Lower	Upper
1. SDQ Total difficulties[#]					
One parent with persistently high PTSD vs both persistently low*	1.60	0.68	0.14	0.25	2.94
2. SDQ Emotional difficulties[#]					
One parent with persistently high PTSD vs both persistently low**	0.84	0.26	0.20	0.34	1.34
3. SDQ Conduct problems[#]					
No significant predictor variables					
4. SDQ Hyperactivity problems[#]					
Child age**	-0.79	0.27	-0.18	-1.32	-0.26
5. SDQ Peer problems[#]					
Child gender*	0.37	0.18	0.12	0.01	0.76
6. SDQ Prosocial					
No significant predictor variables					

[#] Only statistically significant results of the second (final) step of each regression is reported for space reasons. Predictor variables included child age, child gender, and one parent with persistently high PTSD vs both persistently low.

* $p < 0.05$, ** $p < 0.01$

Table 4

Table 4. Regressions predicting SDQ scores for Child 1, where both Father or Mother have persistent high PTSD symptoms vs both Father and Mother low level PTSD symptoms.

Dependent variable				95% CI	
Predictor variable	B	SE B	β	Lower	Upper
1. SDQ Total difficulties[#]					
Both parents with persistently high PTSD vs both persistently low*	2.37	0.99	0.22	0.42	4.33
2. SDQ Emotional difficulties[#]					
Both parents with persistently high PTSD vs both persistently low**	1.11	0.36	0.28	0.39	1.83
3. SDQ Conduct problems[#]					
No significant predictor variables					
4. SDQ Hyperactivity problems[#]					
No significant predictor variables					
5. SDQ Peer problems[#]					
Child gender*	0.69	0.26	0.24	0.18	1.19
6. SDQ Prosocial[#]					
No significant predictor variables					

[#] Only statistically significant results of the second (final) step of each regression is reported for space reasons. Predictor variables included child age, child gender, and both parents with persistently high PTSD vs both persistently low.
* $p < 0.05$, ** $p < 0.01$

Table 5

Table 5. Regressions predicting SDQ scores for Child 1, where both Father and Mother have persistent high PTSD symptoms vs either Father and Mother have high level PTSD symptoms.

Dependent variable				95% CI	
Predictor variable	B	SE B	β	Lower	Upper
1. SDQ Total difficulties[#]					
No significant predictor variables					
2. SDQ Emotional difficulties[#]					
Both parents with persistently high PTSD vs only one of Father or Mother have persistently high PTSD symptoms *	0.60	0.27	0.14	0.06	1.14
3. SDQ Conduct problems[#]					
No significant predictor variables					
4. SDQ Hyperactivity problems[#]					
Child age**	-0.78	0.27	-0.18	-1.30	-0.25
5. SDQ Peer problems[#]					
Child gender*	0.37	0.18	0.12	0.01	0.73
6. SDQ Prosocial[#]					
No significant predictor variables					

[#] Only statistically significant results of the second (final) step of each regression is reported for space reasons. Predictor variables included child age, child gender, and both parents with persistently high PTSD vs only one of Father or Mother have persistently high PTSD symptoms.
* $p < 0.05$, ** $p < 0.01$

Figure 1

Figure 1. Father PTSD trajectories for four-class solution (left) and Mother PTSD trajectories for two-class solution (right).