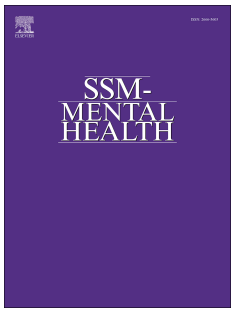
Journal Pre-proof



Displacement-related stressors in a Sri Lankan war-affected community: Identifying the impact of war exposure and ongoing stressors on trauma symptom severity

Fiona C. Thomas, Simon Coulombe, Todd A. Girard, Tae L. Hart, Shannon Doherty, Giselle Dass, Kolitha Wickramage, Chesmal Siriwardhana, Rajendra Surenthirakumaran, Kelly McShane

PII: S2666-5603(22)00069-X

DOI: https://doi.org/10.1016/j.ssmmh.2022.100129

Reference: SSMMH 100129

To appear in: *SSM - Mental Health*

Received Date: 31 December 2021

Revised Date: 30 April 2022

Accepted Date: 1 June 2022

Please cite this article as: Thomas F.C., Coulombe S., Girard T.A., Hart T.L., Doherty S., Dass G., Wickramage K., Siriwardhana C., Surenthirakumaran R. & McShane K., Displacement-related stressors in a Sri Lankan war-affected community: Identifying the impact of war exposure and ongoing stressors on trauma symptom severity, *SSM - Mental Health* (2022), doi: https://doi.org/10.1016/j.ssmmh.2022.100129.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2022 Published by Elsevier Ltd.

Journal Pre-proof

Ryerson University

Department of Psychology
Faculty of Arts

RE: Manuscript Number: SSMMH-D-21-00353

Alexander C. Tsai
Co-Editor-in-Chief
Social Science and Medicine – Mental Health
Manuscript Number: SSMMH-D-21-00353

April 29, 2022

Dear Dr. Tsai and reviewers of SSM-Mental Health:

Please see below for updated author contributions:

Authors (and CRediT contributions), in order:

Fiona C. Thomas: conceptualization, formal analysis, data curation, funding acquisition, investigation, methodology, project administration, supervision, validation, visualization, writing - original draft, writing - review & editing
Simon Coulombe: support with formal analysis, investigation, methodology, visualization, writing - review & editing
Todd A. Girard: support with formal analysis, investigation, methodology, resources, software, supervision, validation, visualization, writing—review & editing
Tae Hart: support with formal analysis, investigation, methodology, supervision, validation, visualization, writing—review & editing
Giselle Dass: data curation, funding acquisition, resources, project administration, validation, writing - review & editing
Shannon Doherty: conceptualization, data curation, funding acquisition, resources, project administration, validation, writing - review & editing
Kolitha Wickramage: conceptualization, validation, supervision, writing - review & editing
Chesmal Siriwardhana: conceptualization, methodology, resources, funding acquisition, supervision (until death in 2017).
Rajendra Surenthirakumaran: Data curation, resources, project administration, validation, writing - review & editing
Kelly McShane: conceptualization, funding acquisition, methodology, supervision, validation, writing—review & editing

Journal Pre-proof

Journal Pre-proof

Abstract

In recent years, there has been a shift in the literature towards identifying how ongoing stress adversely affects mental health beyond the effect of direct exposure to war-related violence. The goal of the current study was to investigate the relationship between displacement-related stressors and trauma symptom severity. Participants (N = 1015) were recruited from primary healthcare clinics (PHCs) in Northern Sri Lanka and completed a demographic and displacement history questionnaire, the Stressful Life Events Checklist, and the Harvard Trauma Questionnaire. Four latent stressor constructs were identified through exploratory and confirmatory factor analyses: 1) personal safety concerns; 2) war-related loss; 3) material loss, and 4) personal hardships. Structural equation modeling was used to examine the relationship between stressors and trauma symptom severity. In the final structural equation model, war-related loss and material loss were positively related to symptom severity whereas psychosocial hardship was found to be negatively related to symptom severity. Results highlight how an integrated model of mental health can more fully inform the needs stemming from displacement-related stressors.

Keywords: chronic stressors, posttraumatic stress disorder, Sri Lanka, post-conflict, structural equation modelling.

Journal Pre-proof

Journal Pre-proof

Displacement-Related Stressors in a Sri Lankan War-affected Community: Identifying the Impact of War Exposure and Ongoing Stressors on Trauma Symptom Severity

1. Introduction

Over the last two decades, the largest scale of forced migration and displacement of individuals affected by civil conflicts has occurred. Such conflict-driven forced displacement has resulted in an increased burden of mental disorders in affected populations, highlighting the extensive need for mental health and psychosocial supports for this population [1, 2]. In this context, posttraumatic stress disorder (PTSD) has been a frequently researched diagnosis. As highlighted by Miller and Rasmussen [3], the emphasis on the diagnosis of PTSD and domination of the biomedical model in war-affected communities and displaced populations can be traced to several simultaneous events including the large-scale refugee movement to Europe and North America in the late 20th century coupled with the recently developed diagnosis of PTSD in 1980 [4]. The diagnosis of PTSD resonated as an explanatory model for many clinicians and humanitarian workers in post-conflict settings, contributing to a spectacular global spread of the labelling of posttraumatic sequalae [5].

In recent years however, there has been increased recognition that individuals experience a great deal more than discrete intermittent events of violence and loss in complex situations of war and displacement. Chronic and highly stressful social and material conditions resulting from armed conflict, additionally permeate daily life [6, 7]. In other words, identifying sources of distress is critical for fostering recovery because effective interventions will likely differ depending on the root causes.

Consistent with the recent shift in literature towards identifying how sources of chronic stress adversely impact mental health in post-conflict settings above and beyond direct exposure

to war-related violence (e.g., [8-10]), the current study drew upon theoretical frameworks rooted in a social ecological perspective to understand the root causes of distress experienced by war-affected communities in Northern Sri Lanka. This study contributed to the first author's doctoral dissertation [11]. The overall goal of the current study was to explore the relationship between chronic stressors and PTSD symptom severity in post-conflict Northern Sri Lanka.

As a result of the protracted conflict in Sri Lanka, families and communities have been uprooted from familiar and traditional ecological contexts [12]. Many have experienced not only direct exposure to violence, but also secondary traumatic events associated with displacement such as loss of community, lengthy and dangerous journeys, and inadequate resources or shelter. In one study with youth in Eastern Sri Lanka, Fernando and colleagues [13] found that stressors such as abuse, inter-parental conflict, and material scarcity accounted for significantly more variance than war exposure on most mental health variables, including PTSD. In a separate intervention study in a school setting in Northern Sri Lanka, children reported exposure to war-related events as well as chronic stressors such as poverty, interpersonal conflicts with neighbours, and having difficulty meeting basic needs [14]. Findings from qualitative studies highlight various examples of stressors in post-conflict Sri Lanka. These include imprisonment, torture and physical abuse in detention, family members being kidnapped [15, 16], family problems (e.g., maltreatment by children), loss of land and limited economic opportunities, lack of basic needs, and stigma for imprisonment [16]. This literature highlights the presence of war-related and chronic stressors for various populations in Sri Lanka; however, there has not been a recent systematic quantitative undertaking of identifying chronic stressors in Sri Lankan war-affected individuals across the age spectrum while identifying the relationship of stressors with trauma symptom severity to the best of our knowledge.

Journal Pre-proof

As research on the psychological impact of armed conflict and forced migration has increased, two distinct approaches have emerged, those being the *war exposure* and *psychosocial approaches*. The *war exposure model* can be understood broadly as part of the clinical model of mental health interventions in post-conflict settings and has historically dominated research on the mental health effects of armed conflict, primarily related to PTSD [17]. Conversely, advocates of the *psychosocial approach* argue that ongoing stress, resulting from social and material deprivation caused or worsened by war (e.g., loss of property, inadequate resources), impacts mental health in conflict and post-conflict settings above and beyond direct exposure to war-related violence and loss [18].

Miller and Rasmussen [19] sought to bridge the divide between the war-exposure and psychosocial approaches and proposed a framework on *daily stressors*. The authors argued that the focus on a discrete set of traumatic events during war (i.e., the war exposure model) did not take into consideration the daily stressors that typified situations of organized violence, and which often exacerbated mental health symptoms [7]. Miller and Rasmussen define daily stressors as "the stressful social and material conditions of everyday life that are common within settings of organized violence" [7, p. 33]. These stressors are often of a chronic or repeated nature, largely beyond people's control, and typically result from, or are worsened by armed conflict [7, 19]. For the purposes of this study, daily stressors will be referred to as 'chronic stressors'. Although the term 'daily stressors' is often used in the literature, the authors opted to use 'chronic stressors' to capture the ongoing and enduring stress encountered by war-affected individuals in Northern Sri Lanka.

Regarding the *war exposure* model, studies have suggested that the positive association of war exposure and PTSD continues to remain significant even after daily stressors were added

to models; however, the strength of the association was found to consistently diminish, suggesting that chronic stressors partially mediate the impact of war trauma on mental health status [3, 7]. Several criticisms regarding the war exposure model and clinical approach emerged in response to the inadequacy of these models for responding to mental health problems stemming from social, political, and economic complexities. The reasons for the criticism are varied but include methodological problems of assessment (e.g., [20]), issues with cross-cultural application of the diagnosis of PTSD (e.g., [21]), and an argument that the diagnosis of PTSD does not accurately capture the complexity and chronic nature of stressors that individuals in conflict settings encounter (e.g., [22, 23]). The latter argument is particularly prominent in Sri Lanka, given the impact of the 26-year protracted conflict (1983-2009) combined with losses endured following the 2004 Indian Ocean tsunami. Consequent to the civil war, approximately 800,000 individuals, families and communities, primarily in the North and the East, were uprooted from their homes and communities [12; 24-25]. Related to the 2004 tsunami, researchers examined the relative roles of trauma and daily stressors in Sri Lankan adolescents residing in areas impacted by the tsunami; they found that adolescents with a history of traumatic events additionally experienced daily stressors, and these stressors were associated with more severe symptoms and impairment [26]. It was argued that the narrow focus on trauma resulted in overlooking the broader social and material conditions that shaped distress [18]. Research further suggests that daily stressors partially mediate the impact of war trauma on mental health status, thus indicating that a social ecological model inclusive of post-conflict stressors shows greater predictive power than the more narrowly defined war exposure model [3, 7].

The psychosocial approach garnered attention globally for its application from a social ecological perspective, which includes greater appreciation for the interdependency of the

individual, family, community, and broader systems and their influences on development [18]. In Sri Lanka, the psychosocial approach evolved locally from various clinicians and mental health leaders in the field in response to their dissatisfaction with the theoretical and institutional approach of the clinical model [18]. It also became clear that a clinical model and individual-based interventions alone were not sustainable in a country with 0.29 psychiatrists/100,000 people and no clinical psychologists in the Northern region [27]. Although local idioms of distress were identified in Sri Lanka to further understand how mental health symptoms are locally conceptualized (e.g., [28]), research has illustrated that communities often interpreted their distress using socioeconomic markers. For instance, Samarasinghe notes that, "research in Sri Lanka has revealed that most people living in conflict areas seldom understood their suffering in psychological terms. Instead, they tended to recognize that the material and social conditions of their lives had a bearing on their psychological well-being" [29, p. 372]. Consequently, interventions shifted to address the social and structural circumstances of people's lives. Despite the plethora of psychosocial interventions in Sri Lanka often stemming from ethnographic perspectives on ecological stressors (e.g., [28, 29]), there remains limited systematic understanding of what these specific stressors are and their relationship to war-related stressors and PTSD symptom severity.

Miller and Rasmussen [3, 19] argue that neither a war exposure nor psychosocial approach alone is sufficient for understanding the profound psychological impact of armed conflict in combination with a host of highly stressful conditions in post-conflict settings. The daily stressors model allows for encapsulating intervening variables that may either partly or fully explain the impact of war exposure on psychopathology [19]. Similarly, several reviews have identified that mental health of refugees is impacted by war-related violence in combination with the constellation of ongoing post-migration or displacement-related stressors (e.g., [1, 2, 30-32]). Based

on their review of studies that examined the role of daily stressors among those impacted by conflict, Miller and Rasmussen found that the war exposure approach overestimates the magnitude of the direct impact of war exposure in explaining psychopathology in post-conflict settings [19]. Studies suggest that stressors such as domestic violence, discrimination, poverty and unemployment, social isolation, and legal status uncertainty in predictive models account for a great deal of variance in symptomatology severity [33-38]. Together, such results suggest that daily stressors partially mediate the impact of war trauma on mental health status, thus indicating that a social ecological model inclusive of post-conflict stressors shows greater predictive power than the more narrowly defined war exposure model [3, 7].

1.2 The Current Study

The current study was conducted in collaboration with a larger five-year research program titled, "Integrating mental health into primary care for conflict-affected populations in Northern Sri Lanka" (COMGAP-S) [39]. The study described here is part of a mixed-method sequential exploratory design, where qualitative findings [40] informed the current study. The overall aim of the current study was to explore the relationship between stressors and PTSD symptom severity in post-conflict Northern Sri Lanka. Two specific objectives were pursued: 1) we sought to quantitatively assess the grouping of stressors as identified by participants in the qualitative study [40]. Following from the literature and qualitative findings (i.e., [40]), it was anticipated that a data-driven factor analysis would result in the identification of multiple factors, including one or more factor(s) focused on war-related stressors and one or multiple factor(s) focused on every day, chronic stressors; 2) we subsequently examined the relationship between exposure to stressors (i.e., war-related and chronic stressors) and PTSD symptom severity. Post-conflict mental health research suggests that exposure to chronic stressors predicts levels of distress as strongly as exposure to war-related stressors [3]. Similarly, chronic stressors have also

been found to be positively associated with PTSD [9, 41]. In line with these findings, it was hypothesized that exposure to war-related as well as to chronic stressors would be positively associated with PTSD symptom severity.

2. Method

The current study was approved by the institutional research ethics boards at the Toronto Metropolitan University in Canada and the University of Jaffna in Sri Lanka.

2.1 Site Selection and Participant Description

Twenty-five primary healthcare clinics (PHCs) were randomly selected based on proportional cluster selection, in that districts with a lower number of internally-displaced persons (IDPs) were allocated fewer clusters [39]. Participants were recruited from PHCs located across all five districts (Jaffna, Mannar, Mullaitivu, Vavuniya, Kilinochchi) in the Northern Province of Sri Lanka. Each of these districts were severely affected by the conflict and the majority of the population was internally displaced at one time or another, ranging anywhere from two years [42] to two decades [43]. Many of those displaced have now returned to the five districts in Northern Sri Lanka. See Doherty et al. [39] for further details on methods and procedures related to the parent study (COMGAP-S).

The full sample from the COMGAP-S research study [39] was used for analysis as part of the current study. Participants (N = 1015) included female and male adults, 18 years and older, who were internally displaced at any time during the conflict. A description of participant demographics is included in Table 1. Mental health issues were prevalent in this sample. As noted by Doherty and colleagues, 58.8% of participants screened positive for a mental health disorder based on the measures administered. Relatedly, 42.4% of participants screened positive

for two or more mental health disorders [39]. Prevalence of PTSD was 13.7% based on completion of the Harvard Trauma Questionnaire (HTQ; discussed further below).

Table 1

Sociodemographic Characteristics of Participants

Characteristic	Level	N	*Weighted Percent
Age Group	18 to 34	144	15.0
	35 to 49	278	24.3
	50 to 64	335	32.2
	65 +	258	28.5
Gender	Female	533	52.2
	Male	482	47.8
Marital Status	Married	802	79.6
	Widowed, Separated, Divorced or Missing	164	15.8
	Never Married	48	4.5
Ethnicity	Muslim or Sinhala	109	6.9
	Tamil	906	93.1
Religion	Hindu	680	72.7
	Islam	111	7.2
	Christian or other	224	20.0
Employment Status	Employed	434	38.6
	Unemployed/Off Sick/Disabled	101	11.2
	Student, Retired, Other	70	8.3
	Housewife / At Home	410	41.9
Education Level	No formal education, other education	90	8.9
	Grades 1-Grade 5	307	27.8
	Grades 6 through O/Ls[a]	511	51.9

	University or Higher	107	11.4
Number of Times Displaced	Once	192	22.5
	More Than Once	823	77.5

Note. N = 1015; *Weighted based on population size

[a] Ordinary Level, approximately equivalent to Grade 11-12 in North American educational standards

2.2 Measures

In the COMGAP-S cross-sectional study, participants were assessed at one time point by a trained research assistant (RA). RAs administered the package of questionnaires with data collection forms developed using Kobo toolbox, version 1.4.8 [44]. For the current study, data from the Sociodemographic and Displacement History questionnaire, Stressful Life Events Checklist, and the HTQ were included for analyses.

2.2.1 *Sociodemographic and Displacement History Questionnaire*

Participants completed a questionnaire on demographics, displacement history, and return and post-migration experiences. Researchers involved with COMGAP-S developed this measure and local RAs were involved in the translation process. Questions were based on demographic information (e.g., age, occupation, educational level), housing circumstances (e.g., "how many people share the house with you?"), displacement history and conflict experiences (e.g., "did you sustain injuries as a result of the conflict?"). Participants selected responses from a list of options. Both questionnaires were used in a previous epidemiological cross-sectional study among the Tamil population in Sri Lanka [43].

2.2.2 *Stressful Life Events Checklist*

The Stressful Life Events Checklist was adapted from the List of Threatening Experiences questionnaire to more appropriately reflect stressors experienced in a post-conflict

setting [45]. Participants were asked to select whether they experienced any stressful events from a list of items (e.g., "serious injury, illness or assault to yourself"; "death of a parent, spouse/partner, child, brother or sister of yours"; "no money for food, education, health and other essential things in life"). Participants additionally indicated whether they experienced these stressors in their lifetime, the past year, or in the past month. The checklist was used in a previous epidemiological cross-sectional study among the Tamil population in Sri Lanka [43]. The Sociodemographic and Displacement History Questionnaire, as well as the Stressful Life Events Checklist from the COMGAP-S Participant Questionnaire Package were reviewed. Items that fit within the Social Ecological Model of Stressors from the qualitative study (i.e., [40]) were identified and included for analysis (discussed further below).

2.2.3 *Harvard Trauma Questionnaire (HTQ)*

PTSD was measured using the first section of the HTQ, which asks about various trauma events, as well as emotional symptoms considered to be uniquely associated with trauma [43]. The items administered for the current study correspond to the DSM-IV PTSD diagnostic criteria based on the study timelines and availability of the validated HTQ for use with the Tamil population in Northern Sri Lanka [42, 46]. In line with previous literature (e.g., [47]), the HTQ was included as a continuous variable (i.e., measuring symptom severity). From a psychometric perspective, including the continuous measure of PTSD severity allowed for the maximal use of nuanced data. Skewness and kurtosis were severely non-normal for the HTQ (i.e., 5.7 and 51.03, respectively). However, estimators that are robust to non-normality were used in the MPlus® software package (Version 8; [48]). The HTQ had excellent internal consistency in this sample, $\alpha = .91$.

2.3 Procedure

Based on power analysis conducted for the parent study, trained RAs approached 1,202 individuals across the randomly selected public PHCs. Of 89 PHCs in Northern Province, 25 PHCs were randomly selected for the COMGAP-S study (see Doherty et al., [39] for further details on site selection). Systematic random sampling [49] was used with trained RAs approaching every third attendee at PHC registration desks until 41 participants were recruited per facility. Structured interviews with recruited participants were conducted between June 20 to October 10, 2016. Although questionnaires were self-report measures, RAs administered the questionnaires due to literacy issues for many participants. From those approached, 177 declined to participate, eight interviews were incomplete, and two participants reported no history of displacement. The latter two participants were not retained in the final analysis for a total of 1,015 included in the final sample. Participants were provided with tea, coffee and snacks during interviews as per local customs. No other incentives for participation were provided.

Written informed consent was obtained unless participants' literacy levels necessitated verbal consent. As RAs were fluent in Tamil, Sinhalese, and English, competency and capacity were assessed in the language that was most comfortable for the interviewee. Likewise, interviews were conducted in the interviewee's preferred language. This was possible as all measures were translated and validated in Tamil, Sinhalese and English [39].

RAs were also provided training in ensuring the safety of participants and a Standard Operating Procedure was developed to guide decisions during emergency situations. As interviews were conducted in PHCs, physicians were available if a participant became distressed during the interview process. Additionally, a senior team member from the COMGAP-S study was on site during the data collection period.

2.4 Data Analytic Strategy

As noted, the Social Ecological Model of Stressors [40] informed the quantitative analysis for the current study (process described further below). First, descriptive statistics and correlational analyses were conducted to investigate simple relationships between variables of interest (i.e., demographics and PTSD). Subsequently, exploratory and confirmatory factor analyses were conducted to determine the factor loadings for chronic stressors. Structural equation modelling (SEM) was used to further test hypotheses. All analyses were conducted with the Mplus® software package (Version 8; [48]).

2.4.1 Objective 1: Exploratory and Confirmatory Factor Analysis

Exploratory factor analysis (EFA) was conducted with one to six factors and informed conceptually by the Social Ecological Model of Stressors established in the qualitative study [40]. The rationale for testing EFA with one to six factors was based on the qualitative themes that emerged with the goal of identifying the most parsimonious and meaningful number of factors. Sections from the Sociodemographic and Displacement History Questionnaire, as well as the Stressful Life Events Checklist from the COMGAP-S Participant Questionnaire Package were reviewed. Items were identified based on the Social Ecological Model of Stressors [40], and reflective of the systemic, war exposure and daily, chronic stressors identified in participants' narratives. In addition to determining whether to retain or delete items based on estimates and modification indices, items were deleted if they were redundant with other items before running the analysis. In this way, items were retained based on balancing between parsimony and comprehensiveness, while guided by modification indices and theoretical justifications. Items included for further analysis were dichotomized by assigning a score of 1 for any item rated 1 (yes) or 0 (no). This list was independently reviewed by the first author (FCT)

and a statistician (SC) to ensure that the final list of stressors included for quantitative analysis was comprehensive.

Once the first author (FCT) determined the final list of items for inclusion, EFA was initially conducted with 50% of the sample, randomly identified (n = 509). Items that cross-loaded on multiple factors or did not load on any factors, were removed based on the estimates and modification indices. This process was repeated until all items loaded on a single factor. Multiple means were used in combination to determine the ideal number of factors, including the scree plot, oblimin-rotated factor loadings, and indices of fit. To avoid deleting items unnecessarily, factors were not retained where multiple items cross-loaded on two or more factors (as this would require item deletion).

Items were either deleted or moved based on whether they loaded strongly on multiple factors, or if their absolute factor loading value was ≥. 35 [50]. Specifically, the following procedure was applied: 1) if items cross-loaded ≥ .35 on multiple factors and there was a <.10 difference between the loadings, the item was deleted and the analysis was re-run; 2) if an item loaded ≥.35 and there was a ≥.10 difference between the two loadings, this item was retained. An iterative process was followed to identify the most comprehensive, yet parsimonious number of factors.

The following fit indices were used to determine the best fitting number of factors for EFA and CFA: the Chi-square Goodness of Fit (χ^2), the comparative fit index (CFI, [51]), the Tucker-Lewis Index (TLI, [52]), the root mean square error of approximation (RMSEA; [53]), and the standardized root mean square residual (SRMR; [54]). As χ^2 is dependent on the sample size, a number of other fit indices were established [55]. For both the CFI and TLI, values ≥ .90 indicate a satisfactory fit [56]. A good fit between the data and the hypothesized model is

indicated by RMSEA values of .06 or less [54], whereas RMSEA values up to .08 indicate a reasonable fit [57]. A satisfactory SRMR fit is indicated by values less than or equal to .08, with a preference for lower values [54]. Variance-adjusted weighted least squares method (WLSMV) was used as a robust approach for modelling categorical variables [58, 59]. To note, AIC or BIC model fit estimates are not reported in MPlus when categorical variables are used [60]. Direct oblimin rotation was used as it was assumed that the factors were correlated [61]. Additionally, in instances where more than one potential model showed similar indices of fit, nested model comparisons were used to test the addition or removal of parameters [62]. The Kaiser-Guttman rule of thumb (i.e., eigenvalue >1) was also used to help determine which factors to retain [63].

Parallel Analysis (PA) allows for a more nuanced way to set the threshold for the eigenvalue criterion, compared to the Kaiser-Guttman rule of thumb [64]. As MPlus does not support PA with dichotomous data, the FACTOR program (version R10.9.02; [65]) was used with polychoric correlations and PA was based on the optimal implementation method [66] with 500 permutations.

After EFA was conducted, confirmatory factor analysis (CFA) was subsequently conducted with the full sample (see Results for further details). The following indices of fit and criteria were considered to evaluate the adequacy of the tested models: CFI and TLI $\geq$ .90; RMSEA $\leq$ .06; SRMR $\leq$ .08 [56]. MPlus provides the optimal option for CFA modelling with categorical data, particularly because the WLSMV estimator is currently only available in MPlus [50]. With regards to internal consistency, the Kuder-Richardson Formula 20 (*KR20*) is dichotomous [67-68] and reported in the Results for each of the factors from the final CFA model.

2.4.2 Objective 2: Structural Equation Modeling (SEM)

Once stressor themes were identified based on EFA and CFA, SEM was conducted to test the conceptual model of the relation between exposure to stressors and PTSD symptom severity. The stressor themes were modeled as latent factors with indicators. The following covariates were accounted for: marital status, ethnicity, religion, age-group, gender, occupation, and education. This model simultaneously examined the contribution of each of the stressor themes in the prediction of PTSD symptom severity, based on the HTQ. Regarding the age-group covariate, participants were grouped by those born before 1983 (i.e., prior to the official start of the Sri Lankan civil war) and those born after 1983. The rationale for this grouping was to determine if there were any differences for the younger generation who have primarily experienced a life in conflict and displacement. As with EFA and CFA analyses, model fit was evaluated based on the following goodness-of-fit indices: 1) χ^2, 2) CFI [51], 3) TLI [52], 4) RMSEA [53], and 5) SRMR [69]. Modification indices were reviewed to improve the fit of the model. The Social Ecological Model of Stressors [40] was also considered when making decisions to add or remove pathways between variables.

3. Results

3.1 Objective/Hypothesis 1

3.1.1 Exploratory and Confirmatory Factor Analysis (EFA and CFA)

Twenty-six items were initially included in the EFA (Supplementary Information, Table 8). Although the six-factor model appeared to have the best fit based on simple comparisons of absolute values (Table 2), there were too few items (i.e., less than two) that met the ≥ .35 cut-off per factor [70]. The five-factor model was also an inadequate fit as two items (i.e., SL3C3 – *unable to get treatment for an illness or injury in the past month*; SL3J3 – *no money for food, education, health and other essential things in life for past month*) cross-loaded on both factors one and five. To retain the five-factor model, these two items would need to be deleted. Rather

than delete additional items, the four-factor model was conceptually determined to be a better fit. Additionally, the aforementioned items (i.e., SL3C3 and SL3J3) did not cross-load on multiple factors as it did in the two-factor model.

Journal Pre-proof

Table 2

Results of Exploratory Factor Analysis, Factors 1 to 6 (N=509)

	Chi square (df)	CFI	TLI	RMSEA (90% CI)	SRMR
			Complete list of items		
1 factor	2093.43* (299)	.839	.825	.109 (.104, 0.113)	.172
2 factors	1238.565* (274)	.914	.897	.083 (.078, 0.088)	.124
3 factors	881.318* (250)	.943	.926	.070 (.065, 0.076)	.099
4 factors	614.132* (227)	.965	.950	.058 (.052, 0.063)	.078
5 factors	456.165* (205)	.977	.964	.049 (.043, 0.055)	.062
6 factors	353.865* (184)	.985	.973	.043 (.036, 0.049)	.051
			After item deletion*		
1 factor	1334.123* (119)	.884	.868	.142 (.135, 0.149)	.207
2 factors	542.103* (103)	.958	.945	.092 (.084, 0.099)	.106
3 factors	296.043* (88)	.980	.969	.068 (.060, 0.077)	.075
4 factors	137.401* (74)	.994	.989	.041 (.030, 0.052)	.042
5 factors	86.758* (61)	.998	.995	.029 (.013, 0.042)	.033
6 factors	45.339 (49)	1.000	1.001	.000 (.000, 0.025)	.023

Note: CI = Confidence Interval; *After removing items that cross-loaded or did not load on respective factors.

*p < .001.

As an additional approach in determining the ideal number of factors, direct oblimin (oblique) rotation, revealed four factors with eigenvalues > 1.0. A four-factor model was thus found to be the most robust and parsimonious factor structure, based on fit indices. The four-factor model provided a minimum of three items per factor, which is useful for stability and subsequent model testing. It also conceptually fit with the themes of stressors identified in the qualitative study [40].

Journal Pre-proof

Scree plot analysis suggested a distinctive reduction in the slope after two factors [71]. Thus, for additional statistical validation, model comparison was conducted between the four-factor (which, as mentioned, was found to provide the best fit) and two-factor models. The *difftest* command was applied to test for differences in model fit [72]. The four-factor model provided a statistically better fit than the simpler two-factor model (Table 3): χ^2 (5)= 371.1, p<.001 [73]. Additionally, the four-factor model was more closely conceptually aligned with the qualitative themes [40]. In the spirit of understanding the nuanced impact of stressors and their relationship to trauma symptom severity, the four-factor model was selected as the final model.

The traditional Horn PA and the Bayesian Information Criterion (BIC) method supported the four-factor model. Although a two-factor model could be considered to be the most parsimonious, it is not possible to rule out shared method variance. Specifically, in the two-factor model, factor one was defined by war-related stressors, and factor two included all other items (i.e., recent, chronic stressors). Thus, the two-factor model could be a result of temporal content (i.e., war exposure stressors are historically based, whereas chronic stressors ask about stressors in the past month).

Table 3

Two-Factor Model versus Four-Factor Model

	χ^2 (df)	CFI	TLI	RMSEA	SRMR
2-Factor	1612.24 (103)	.947	.938	.12	.129
4-Factor	563.73 (98)	.984	.980	.068	.077

Once the four-factor model was identified, CFA was initially conducted with the second half of the random sample as is typical in split-sample model development (e.g., [74]). MPlus flagged that items were highly correlated in the second half of the sample, which created a

statistical issue and resulted in a warning when the model was run. To circumvent any computational issues, CFA was run with the full sample. These four items were no longer as highly correlated and no warnings were issued by the software when using the full sample. In that context, and to maintain the maximum amount of information, the full sample for the final CFA model was used. The four-factor model tested with the full sample showed adequate indices of fit (χ^2 (113) = 636.51; CFI = .975; TLI = .970; RMSEA = .067; SRMR = .087). Thus, CFA supported the theoretically driven four-factor structure. The final list of items based on EFA and CFA are presented in Table 4.

Journal Pre-proof

Journal Pre-proof

Table 4

Results from a Factor Analysis of Stressor Items

Items from the Sociodemographic and Displacement History Questionnaire and Stressful Life Events Checklist	Exploratory factor analysis (n=509) Factor loadings				Confirmatory factor analysis (N=1015) Standardized loadings (SE)			
	F1	F2	F3	F4	F1	F2	F3	F4
Factor 1: Personal Safety Concerns								
1. Witnessed an act of violence: SL3D3[a]	1.013				0.967			
2. Been in combat in a war, or lived in a warzone: SL3E3	0.823				0.954			
3. Moved to a worse (not better) residence or neighbourhood: SL3I3[a]	0.880				0.972			
Factor 2: War Exposure Losses								
4. Did you lose a close family member as a result of the conflict (parent, sibling or child)?: CD28[b]		0.771				0.658		
5. Was a close family member injured as a result of the conflict (parent, sibling or child)?: CD29[b]		0.951				0.889		
6. Did you lose a friend or family member as a result of the conflict?: CD30[b]		0.786				0.953		
7. Was a friend or family member injured as a result of the conflict?: CD31[b]		0.857				0.951		
8. Property loss as a result of the conflict: CD32		0.766				0.516		
Factor 3: Financial Loss and Hardship								
9. Being made redundant or sacked from your job: SL2A3[a]			0.610				0.859	
10. Looking for work without success for more than one month: SL2B3[a]			1.028				0.779	
11. Major financial crisis, like losing the equivalent of 3 months income: SL2C3[a]			0.626				0.914	

Journal Pre-proof

Factor 4: Personal Hardship		
12. Serious injury, illness or assault to yourself: SL1A3[a]	0.664	0.727
13. Serious injury, illness or assault to a close relative: SL1B3[a]	0.692	0.795
14. Something you valued being lost or stolen: SL2E3[a]	0.411	0.712
15. Unable to get treatment for an illness or injury: SL3C3[a]	0.843	0.861
16. No money for food, education, health and other essential things in life: SL3J3[a]	0.904	0.877
17. Death of a close family friend or other relative (e.g., aunt, cousin or grandparent): SL1D3[a]	0.743	0.889

Note. Questionnaire items were presented to participants in Tamil or Sinhala. The English version above has been obtained using back-to-back translation principles; F1 = Factor 1; F2 = Factor 2; F3 = Factor 3; F4 = Factor 4.

[a] Stressors experienced in the past month. [b] The terms 'close family members' and 'family members' were distinguished in that the former referred to immediate family members, while the latter referred to extended relatives.

Journal Pre-proof

Ultimately, the four-factor model was included for Objective 2 based on fit indices, in combination with theoretical and conceptual reasons grounded in the Social Ecological Model of Stressors [40]. The four factors of stressors were labelled as follows: (1) Factor 1: Personal Safety Concerns (*KR20* =.88); (2) Factor 2: War Exposure Losses (*KR20* =.81); (3) Factor 3: Financial Loss and Hardship (*KR20* =.65); and (4) Factor 4: Personal Hardships (*KR20*=.82). Although some sources indicate that .7 to .8 is considered the minimal acceptable value (e.g., [75, 76]), other sources suggest a *KR20* score above .5 is considered reasonable (e.g., [77]). In line with the general rule of thumb for Cronbach α, .60 -.70 is considered an acceptable level of reliability, and .80 or higher is a very good level [78]. As the *KR20* for Factor 3 (material loss) was on the lower end and included a small number of items, the mean inter-item correlation was assessed and fell within the expected range of .2 and .4 (i.e., the mean interitem correlation for Factor 3: Financial Loss and Hardship was 0.39) [79]. For an overview of the frequency with which individual stressors were reported, please see Table 9 in the Supplementary Information.

3.2 Objective/Hypothesis 2

3.2.1 Structural Equation Model (SEM)

The SEM included the four factors of stressors as latent variables, as detailed in Objective 1 (Table 4). As SEM accounts for measurement error when variables are captured as latent versus observed [80], a latent variable of PTSD symptom severity was used including all items from the HTQ. The structural model included pathways from each of the four latent variables of stressors to the latent variable of PTSD symptom severity.

To control for possible covariates, pathways from marital status, ethnicity, religion, age, gender, occupation, and education to the PTSD symptom severity outcome were also included. Only gender contributed significantly, but there was no change in model fit with or without these

covariates. As such, they were retained to indicate that demographics were controlled for and to maintain a comprehensive model. The percentage of missing values was low (<2.9% for all the variables).

The initial proposed model (N = 1015) obtained an inadequate fit, χ^2 (748) = 2579.257 , p < .001; CFI = 0.886; TLI = 0.878; RMSEA = .047; SRMR = .092. Following an iterative process, changes were made based on the estimates and modification indices provided in the MPlus output. Also considering theoretical justifications, changes were conducted until fit was adequate; these changes are described further below. During the process of making adjustments to the model, nonsignificant pathways were removed one by one. For clarity, the addition and removal of pathways based on modification indices is delineated below:

- Personal Safety Concerns (Factor 1) was not significantly related to PTSD symptom severity so the pathway between Factor 1 and PTSD symptom severity was removed.
- A pathway was added from ethnicity to War Exposure Losses (Factor 2).
- Correlations were added between Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardship (i.e., Factors 1, 3, and 4) and question 10 from the HTQ (i.e. “feeling irritable or having outburst of anger”).
- Correlations were added between Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardship (i.e., Factors 1, 3, and 4) and question 13 from the HTQ (“less interest in daily activities”).

These changes made sense for conceptual reasons. For example, Questions 10 and 13 from the HTQ are not necessarily symptoms that are unique to PTSD and may indicate distress beyond PTSD specific symptoms for those experiencing Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardship. However, the finding that Personal Safety Concerns

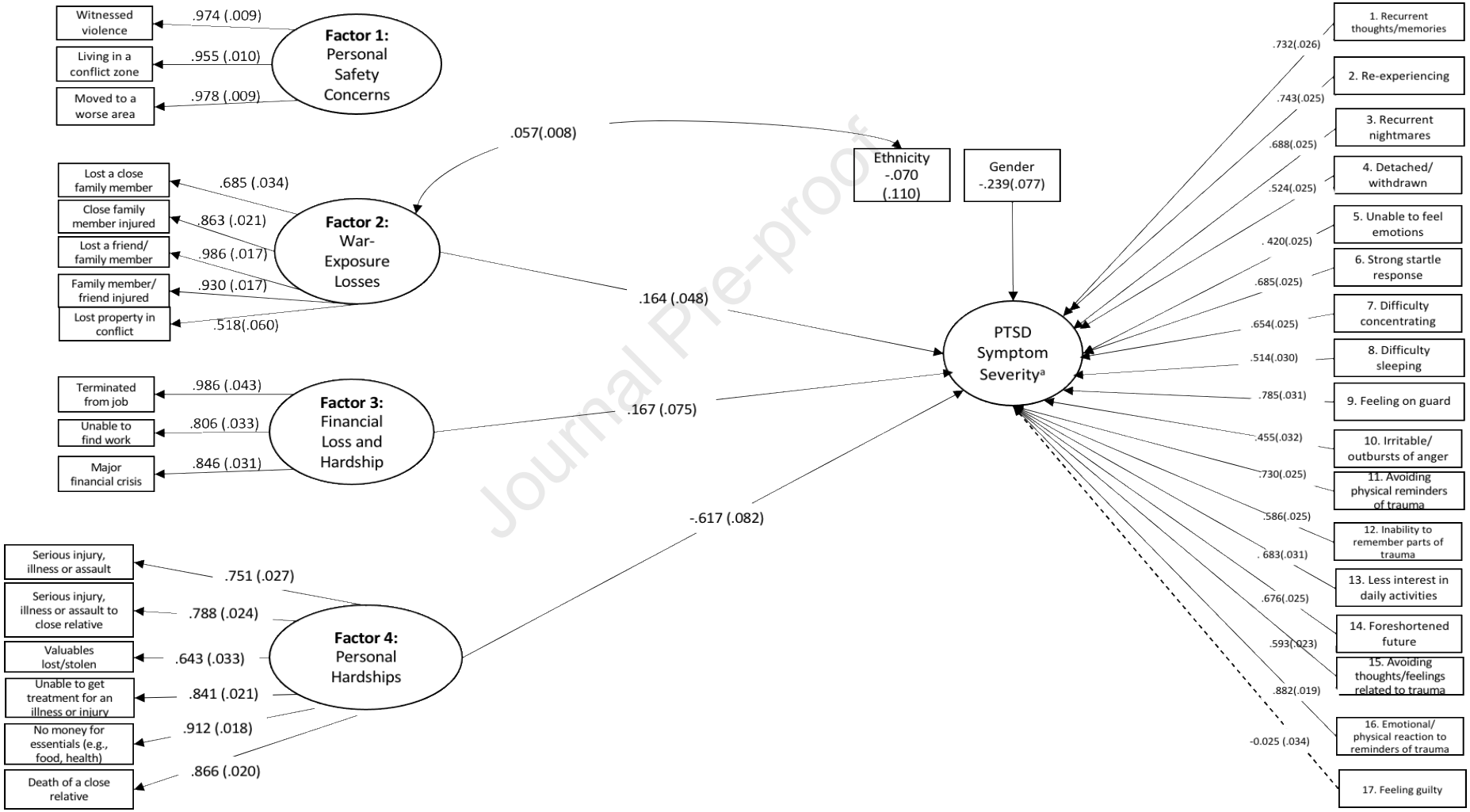
was not significantly related to PTSD generated an unexpected finding. This finding was explored further, as discussed below.

The overall fit of the model improved as a result of making these changes. The final model (Figure 1) had good fit: χ^2 (745) = 2316.7, $p < .001$; χ^2/df = 3.11; CFI = 0.904; TLI = 0.896; RMSEA = .046 (CI, 0.043, 0.048); SRMR = .086. In the final model, War Exposure Losses (Factor 2) and recent Financial Loss and Hardship (Factor 3) were positively related to PTSD symptom severity (i.e., the more War Exposure Losses and Financial Loss and Hardship, the higher PTSD symptom severity) whereas greater Personal Hardships experienced in the past month (Factor 4) related to lower PTSD symptom severity. As noted, Personal Safety Concerns (Factor 1) was not related to PTSD symptom severity in the full model.

Journal Pre-proof

Figure 1

Structural Equation Model of the Relationship Between Stressors and PTSD Symptom Severity



Journal Pre-proof

Note. This model illustrates the relationship between stressors and PTSD symptom severity. Statistics are standardized regression coefficients (standard error in parentheses). All pathways were significant at $p<.05$ except the loading of PTSD17 on PTSD symptom severity (dotted line represents nonsignificant relation). The following pathway between factors and specific Harvard Trauma Questionnaire (HTQ) items are not depicted in the model but were added in the syntax: correlations of Factors 1, 3, and 4 with HTQ10 ("irritable/outbursts of anger"); Correlations of Factors 1, 3, and 4 with HTQ13 ("Less interest in daily activities"). The following demographics were controlled for: occupation, religion, age-group, marital status, educational level, gender, and ethnicity; the only significant covariates were gender and ethnicity. Error terms are omitted from the Figure but were included in the model. There is no residual variance for binary/categorical variables (e.g., all items in factors) [48].

[a] PTSD Symptom Severity was measured by the HTQ.

Journal Pre-proof

Factors 1 to 4 were tested individually to explore the relationship between each factor and PTSD symptom severity (Table 5). The same covariates and pathways used in the full SEM were applied here. The purpose of testing each individual factor was to assess how each factor independently related to PTSD symptom severity.

Table 5

Relationship of Factors 1 to 4 Stressors with PTSD Symptom Severity

Relationship of PTSD symptom severity with Factors	B [95% CI]	β [95% CI]
Factor 1 (Personal Safety Concerns)	-0.352* [-0.427, -0.276]	-0.473* [-0.542, -0.403]
Factor 2 (War Exposure Losses)	0.475* [0.366, 0.584]	0.466* [0.400, 0.531]
Factor 3 (Financial Loss and Hardship)	-0.300* [-0.377, -0.222]	-0.398* [-0.470, -0.325]
Factor 4 (Personal Hardships)	-0.600* [-0.710, -0.490]	-0.625* [-0.676, -0.573]

Note. B = unstandardized beta; β = standardized beta; CI = confidence interval; $N = 1015$.

*p < .001Contrary to what was expected, results indicated that, when run individually, Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardships (i.e., Factors 1, 3 and 4) were *negatively* related to PTSD meaning that the more of these stressors that participants experienced in the prior month, the less severe their PTSD symptoms. When run individually, War Exposure Losses (i.e., Factor 2) was positively related to PTSD meaning that the more War Exposure Losses, the more severe their PTSD symptoms (Table 5).

Consequently, further regression analysis was conducted to better understand the relationship between factors. As reported in Table 6, War Exposure Losses (Factor 2) were negatively related to the other three factors but remained positively related to PTSD. This means that the more individuals experienced War Exposure Losses, the less they experienced recent, chronic Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardship. Personal Hardship (Factor 4) was found to be positively related to Factors 1 and 3, indicating that

individuals who experienced recent Personal Hardships were also more likely to experience recent Personal Safety Concerns (Factor 1) and recent Financial Loss and Hardship (Factor 3).

Table 6

Relationship between Factors 1 to 4 Stressors

Relationship	B [95% CI]	β [95% CI]
Personal Safety Concerns (F1) and War Exposure Losses (F2)	-0.251* [-0.303, -0.199]	-0.412* [-0.486, -0.338]
Personal Safety Concerns (F1) and Personal Hardship (F4)	0.502* [0.449, 0.555]	0.723* [0.678, 0.768]
Personal Safety Concerns (F1) and Financial Loss and Hardship (F3)	0.577* [0.497, 0.657]	0.653* [0.584, 0.722]
War Exposure Losses (F2) and Financial Loss and Hardship (F3)	-0.192* [-0.250, -0.134]	-0.335* [-0.425, -0.245]
War Exposure Losses (F2) and Personal Hardship (F4)	-0.243* [-0.288, -0.198]	-0.540* [-0.604, -0.477]
Financial Loss and Hardship (F3) and Personal Hardship (F4)	0.478* [0.407, 0.549]	0.732* [0.672, 0.792]

Note. B = unstandardized beta; β = standardized beta; CI = confidence interval; $N = 1015$.
*p < .001

To understand this further, the relationship between the factors and demographics was explored (Table 7). Results indicated that while the Tamil population endorsed experiencing more War Exposure Losses (Factor 2 stressors), they reported experiencing less Financial Loss and Hardship (Factor 3) or Personal Hardship (Factor 4) stressors. Female participants endorsed experiencing more Financial Loss and Hardship. Those who endorsed being employed reported experiencing more recent Personal Hardship. As Personal Safety Concerns (Factor 1) were not significantly related to PTSD symptom severity in the final full model, the relationship between this factor and demographics was not explored. These additional analyses provided further insight into the main SEM results and are discussed further in the Discussion.

Journal Pre-proof

Journal Pre-proof

Table 7

Regression of demographic variables on F2, F3 and F4 stressors

	B [95% CI]	β [95% CI]	B [95% CI]	β [95% CI]	B [95% CI]	β [95% CI]
Demographic Variables	Factor 2 (War Exposure Losses)		Factor 3 (Financial Loss and Hardship)		Factor 4 (Personal Hardships)	
Marital Status[a]	-0.085 [-0.208, 0.038]	-0.049 [-0.119, 0.022]	-0.062 [-0.291, 0.167]	-0.024 [-0.115, 0.066]	0.087 [-0.043, 0.216]	0.045 [-0.022, 0.112]
Ethnicity[b]	0.790* [0.583, 0.996]	0.345* [0.267, 0.423]	-0.496 [-0.852, -0.140]	-0.149* [-0.254, -0.044]	-0.447* [-0.630, -0.264]	-0.175* [-0.246, -0.105]
Religion[c]	0.018 [-0.103, 0.140]	0.012 [-0.068, 0.092]	0.120 [-0.086, 0.326]	0.055 [-0.039, 0.148]	-0.055 [-0.185, 0.074]	-0.033 [-0.110, 0.044]
Age-group[d]	-0.054 [-0.205, 0.098]	-0.025 [-0.097, 0.046]	-0.119 [-0.379, 0.142]	-0.039 [-0.124, 0.046]	-0.014 [-0.181, 0.152]	-0.006 [-0.077, 0.065]
Occupation[e]	0.025 [-0.095, 0.145]	0.017 [-0.066, 0.101]	0.023 [-0.176, 0.222]	0.011 [-0.084, 0.106]	0.314* [0.184, 0.445]	0.196* [0.117, 0.276]
Education level[f]	-0.013 [-0.130, 0.104]	-0.008 [-0.081, 0.065]	0.148 [-0.048, 0.345]	0.064 [-0.021, 0.149]	0.036 [-0.090, 0.163]	0.020 [-0.051, 0.092]
Gender[g]	-0.009 [-0.131, 0.113]	-0.006 [-0.092, 0.079]	-0.353* [-0.558, -0.148]	-0.171* [-0.268, -0.07]	0.035 [-0.096, 0.166]	0.022 [-0.060, 0.105]

Note. B = unstandardized beta; β = standardized beta; CI = confidence interval; $N = 1015$.

[a] Married = 1; other (i.e., widowed; separated; divorced; never married; missing due to conflict; missing due to other reasons) = 0. [b] Tamil = 1; other (i.e., Sinhala; Muslim; other) = 0. [c] Hindu = 1; other (i.e., Buddhist; Islam; Catholic/Christian; other) = 0. [d] Born 1983 onwards = 1; born prior to 1983 = 0; [e] Employed = 1; other (i.e., unemployed/disability; student; homemaker; retired; other) = 0. [f] No formal education or formal education until O/Ls = 1; O/Ls or above = 0. [g] Male = 1; Female = 0; ON means DV regressed on IV.

*p < .05.

Journal Pre-proof

Readers interested in how the individual items related to PTSD symptom severity for Factors 1 to 4, please refer to Table 10 in the Supplementary Material. Overall, results presented in the correlation matrix show a similar pattern of results as the overall relationship between the factors and PTSD symptom severity.

4. Discussion

This study examined the relationship between stressors and PTSD symptom severity in post-conflict Northern Sri Lanka. Findings from this study provide some support for the daily stressors model in situations of ongoing adversity. Confirming the first hypothesis, results of this study indicated that stressors grouped together based on multiple factors, including one factor focused on war-related stressors, and three factors focused on recent chronic stressors. Specifically, a four-factor chronic stressors model was identified: Factor 1: Personal Safety Concerns; Factor 2: War Exposure Losses; Factor 3: Financial Loss and Hardship; and Factor 4: Personal Hardships (Figure 1). Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardships were specific to stressors experienced in the month preceding data collection for the current study and War Exposure Losses were items related to stressors experienced during the Sri Lankan civil war.

4.1 Unpacking the Four-Factor Model

The stressors represented by the four factors identified in this study are reflective of findings in the literature. Personal Safety Concerns (Factor 1), and their relationship to distress, have been identified in other displaced populations. In Bangladesh, stateless Rohingya refugees cited safety concerns as one of their top three daily environmental stressors and noted that enhancing their sense of safety would mitigate the impact of traumatic stressors [81]. In Sri Lanka, a recent study using innovative network analysis found that fear of being kidnapped was

identified as a central concern by participants and represented a constant threat and overwhelming fear [82]. Based on their work with Syrian refugees in Jordan, Wells and colleagues [83] note that theoretical approaches that acknowledge the role of constant personal threat in the lives of displaced populations are likely to have more clinical utility, and can be informative for directing resources to modifiable, chronic stressors.

Factor 2, or War Exposure Losses, primarily included items related to loss or injury of family members or friends. In line with findings from the qualitative study [40], it is unsurprising that items specific to loss or injury of loved ones emerged as a constellation of stressors. Findings from the qualitative study pointed to the complicated emotions resulting from sudden and unexpected loss in the context of violence, as well as coping with ambiguous loss [84] in situations where family members remained missing. Unique to the constellation of War Exposure Losses is the inclusion of one item specific to loss of property during the conflict. This finding complements results from the qualitative study where loss of property during the conflict emerged as a salient theme and was often related to subsequent losses [40]. It additionally highlights the significant impact of the loss of land and property for war-affected communities, which is reflective of findings in other post-conflict settings (e.g., [85, 86]). In Sri Lanka, Somasundaram [28] eloquently describes the impact of the loss of land and displacement from villages following the civil war: "in traditional Tamil communities, the village and its people, way of life and environment provided organic roots, a sustaining support system, nourishing environment and network of relationships…a person's identity was defined to a large extent by their village of origin" (p. 91-92). Consistent with this emic perspective from Somasundaram, it coheres that loss of property would correlate closely with other personal losses experienced during the war.

Journal Pre-proof

Also in line with the qualitative findings [40], Financial Loss and Hardship (Factor 3) emerged as another group of recent, chronic stressors. The deleterious impact of unemployment and poverty on the psychological wellbeing of displaced populations is well-documented in resettled refugees [e.g., 87], asylum-seekers who have not obtained legal status in LMICs (e.g., [88]) as well as in Western settings [e.g., 89] and extensively, in post-conflict settings [e.g., 90-92]. The authors of a recent meta-analysis on daily stressors and psychopathology in conflict-affected forced migrants, similarly found that material daily stressors, inclusive of employment-related issues, were positively associated with PTSD symptoms, general distress, and functional impairment [93].

Finally, the items included in the Personal Hardships Factor (Factor 4) are interesting for the range of stressors that fit within this category (e.g., "serious injury, illness or assault"; "valuables lost or stolen"; "no money for essentials"). As was disclosed by some interviewees during the qualitative study, personal injury and illness often translated to an inability to engage in meaningful employment highlighting the interrelated cascade of losses experienced by participants in the current study [40]. The items that constitute Personal Hardship provide further insight into the contextualized experience of losses experienced post-conflict for war-affected communities. In Sri Lanka, researchers have examined the role of stressful life events and their relationship to psychopathology (e.g. [16, 82, 94]). This previous work by Jayawickreme and colleagues identified stressors related to the inability to access basic needs; this finding overlaps with stressors identified in the Personal Hardships category of the current study. However, injury or illness of self, did not emerge in these aforementioned studies. Of note, results of the studies by Jayawickreme are based on data that were collected shortly following the end of the Sri Lankan civil war. The timing of data collection and shifts in environmental stressors may have

influenced the range of additional stressors noted by participants in the current study, including those related to injury and illness. As will be discussed below, the Personal Hardships factor was also unique for its negative correlation with PTSD symptom severity.

4.2 Chronic Stressors and Trauma Symptom Severity

In objective 2, the relationship between each of the stressor factors and PTSD symptom severity was explored through SEM. The authors hypothesized that exposure to both war-related and recent chronic stressors would be positively related to PTSD symptom severity. The final model illustrated a more nuanced relationship. In the context of the full model when all stressors were considered together, War Exposure Losses and Financial Loss and Hardship (i.e., Factors 2 and 3, respectively) were indeed associated with higher PTSD symptom severity in respondents. However, Personal Safety Concerns (i.e., Factor 1) was *not* associated with PTSD symptom severity and Personal Hardship (i.e., Factor 4) was related to *less* PTSD symptom severity in the full model. When evaluated independently, Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardship were each related to *less* PTSD symptom severity while War Exposure Losses was positively related to PTSD symptom severity. This means that only the relationship between War Exposure Losses and PTSD symptom severity and Personal Hardships and PTSD symptom severity remained constant when assessed independently and in the full model.

In the current study, Personal Safety Concerns (Factor 1) was not correlated to PTSD symptom severity when considered with other factors, and negatively related when considered alone. When the relationship between factors was analysed, Personal Safety Concerns was highly correlated with Personal Hardship (β [95% CI] = 0.723 [0.678, 0.768]), indicating that individuals who experienced one group of stressors were likely to experience the other. The high

correlation between these factors suggests shared variance. In the context of the full model then, it is possible that Personal Hardship drives the effect of stressors on PTSD symptom severity more than Personal Safety Concerns.

This was an unexpected finding given that prior studies as noted above have identified safety concerns as a significant source of distress in post-conflict settings. Similarly, other studies with refugee populations have found safety concerns to be a significant stressor [e.g., 91]. In another study in Sri Lanka, researchers working with data from a nationally representative sample found that addressing safety concerns was significantly associated with reduced mental distress in post-conflict Sri Lanka [95]. Specifically, Jayasuriya and colleagues [95] noted that alleviating safety concerns had the potential for reducing depression by 53% and anxiety by 57%. The study by Jayasuriya and colleagues [95] did not explore the relationship of safety concerns with PTSD symptoms, however. Items that comprised Factor 4, Personal Hardship, were also not explored by Jayasuriya and colleagues [95]. In war-affected communities, future research is needed to better understand the complex relationship between safety concerns, personal hardship, and psychopathology. More specifically, interventions targeting Personal Hardship may be a more effective target than interventions aimed at alleviating safety concerns and is worth exploring further.

The unexpected finding of Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardship as being related to *less* PTSD symptom severity when assessed independently also requires further research. This finding was in contrast to objective 2, where a positive relationship was expected between all stressors and PTSD symptom severity. Although it was beyond the scope of this study to explore concepts of resilience, and the included measurement instruments did not directly measure this concept, such nuanced findings indicate the presence of

resilience in war-affected communities. Globally, despite high rates of PTSD and depression in forcibly displaced individuals, Nickerson and colleagues note that "most studies conducted to date have found that the majority of participants did not meet criteria for a mental disorder, highlighting the resilience inherent in refugee and asylum-seeking populations" [96, p. 11]. In the COMGAP-S sample, prevalence of PTSD was 13.7%. This finding parallels a growing body of literature in resilience, which challenges the expectation that individuals who experience conflict will manifest dysfunction [97]. It is possible that prolonged exposure to Personal Safety Concerns, Financial Loss and Hardship, and Personal Hardship may inadvertently lead individuals to develop coping mechanisms and create meaning and growth in the face of adversity. Congruent to this hypothesis, resilience is broadly understood as the capacity of a dynamic system to successfully adapt to challenges that threaten its stability, function or development [98]. As noted in the literature, confronting and engaging with stressors with the appropriate resources can contribute to growth and longer-term adaptive emotional development [99-101]. Specifically, research has found positive correlations between the level of PTSD symptoms or trauma exposure and stress-related growth [102].

Applying similar concepts to the community level, researchers in Sri Lanka have referred to 'collective resilience', highlighting the role of community values, beliefs and traditions as social processes and protection from mass trauma and loss [28, 103]. Somasundaram and Sivayokan [103] argue that such forms of community coping and resilience help individuals deal with, and recover from, the destructive effects of collective trauma. Further exploration into the mechanisms underlying resilience and their relationship to chronic stressors, can be useful for developing successful interventions for war-affected communities.

Journal Pre-proof

From a statistical perspective, additional considerations are of importance in the interpretation of these unexpected results. Independently, Financial Loss and Hardship was negatively correlated to PTSD symptom severity; in the full model, the relationship was positive as Financial Loss and Hardship was related to more PTSD symptom severity. It is important to remember that Financial Loss and Hardship and Personal Hardship were highly correlated (i.e., $\beta = .734$), suggesting a high degree of shared variance between these factors in the full model. As Personal Hardship is consistently negatively related to PTSD symptom severity (when assessed independently and in the full model), it is possible that the inclusion of Personal Hardship stressors in the full model contributed to changing the observed relationship between Financial Loss and Hardship and PTSD symptom severity (from negatively correlated, when assessed independently, to positively correlated in the full model). While a mediation analysis was not performed as it was not the focus of the hypothesized model, a future hypothesis to test is that on the one hand, Financial Loss and Hardship stressors may lead to resilience through an indirect effect mediated by Personal Hardship. There could be a remaining effect (i.e., direct) of Financial Loss and Hardship on PTSD that is detrimental, leading to higher PTSD symptom severity. Thus, it is possible that Financial Loss and Hardship could be driving both a beneficial and a detrimental impact of this group of stressors for war-affected communities. The beneficial impact would overall be larger, which could explain why, when considered independently Financial Loss and Hardship appeared to have a negative relationship (i.e., total effect) with PTSD. Further investigation to test such intricate relationships between these stressors, PTSD, and other psychopathology is warranted.

As predicted, War Exposure Loss was positively correlated with PTSD symptom severity when assessed independently and in the full model. This finding lends support to the value of a

trauma-focused model for some populations. Of note, the majority of stressors included in this factor were related to social losses. Although the conflict in Sri Lanka ended a decade ago, the impact of losing family members or friends as a result of the conflict or having family members or friends injured as a result of the conflict continues to impact PTSD symptom severity for some individuals. This could be related to prolonged and complicated grief as identified in Thomas et al. [40]. As described in the qualitative study, losing a loved one as a result of the conflict was often complicated in that, in many instances, loved ones were missing and their circumstances remained unknown. Without a body, family members held out hope, typically resulting in a complicated grieving process.

Interestingly, the magnitude of the relationship between War Exposure Losses and PTSD symptom severity was smaller in the full model (i.e., $\beta = .164$) versus when the relationship was assessed independently (i.e., $\beta = .466$). This finding further suggests that in the context of other stressors, War Exposure Losses have *less* unique relations with PTSD symptom severity. In particular, Financial Loss and Hardship was almost equally related to PTSD symptom severity in the full model (i.e., $\beta = .167$). This finding is in parallel to the daily stressors literature [3]. These results may also reflect mediation such that the impact of War Exposure Losses may not be entirely independent and could have further adverse impacts through chronic stressors. Overall, results from this study highlight the variable pathways to PTSD symptom severity, including amongst those who are universally exposed to loss and trauma.

4.3 Implications for Clinical Intervention

Historically, mental health interventions for forcibly displaced populations have focused on alleviating symptoms of PTSD presumed to be a consequence of war-related stressors. As

highlighted by Miller and Rasmussen [3], much of the intervention literature in post-conflict mental health has centred on the efficacy of trauma-focused treatment protocols (e.g., Narrative Exposure Therapy or NET; [104]) and various cognitive-behavioural approaches [105]. Studies have shown variable treatment effects, ranging from none to small in a metanalysis of trauma-based treatments for torture survivors [106] to medium and large effects in other treatment studies [107, 108]. More recently, and as illustrated in the current study, there is emerging global evidence that psychopathology is strongly determined by social context [109, 110]. Consequently, while it may be necessary to improve access to evidence based mental health treatments, this approach alone is insufficient for alleviating the suffering associated with mental disorder in situations of chronic adversity.

For several decades, intervention researchers working with resettled refugees in Western contexts have argued that clinical-based interventions such as psychotherapy and psychopharmacology have limited effectiveness in the absence of addressing chronic, displacement-related stressors such as financial hardship, housing difficulties, and social isolation (e.g., [111-113]. The current study proffers a social ecological model, which encapsulates the contextualized experience of stressors and trauma symptom severity for those affected by the conflict in Northern Sri Lanka. Findings support existing literature that emphasizes the integration of mental health supports with layered services, most notably the Inter-Agency Standing Committee (IASC) Guidelines on Mental Health and Psychosocial Support in Emergency Settings [114]. Miller and Rasmussen similarly call for integrated interventions that address both, the chronic and war-related stressors in a sequential approach [19].

Journal Pre-proof

Recognizing that particular stressors are likely to be more salient by age, gender or even geographic location, the four-factor ecological model of stressors and trauma symptom severity presented here can be applied to specific populations to determine how different stressors are experienced, so that interventions can be tailored accordingly. For example, those born during the conflict have primarily experienced a life of multiple displacements, interrupted school attendance, and loss of family, friends, and homes [12].

Findings additionally illustrate that beyond war exposure, it was the loss and injury of loved ones as well as financial hardship, that contributed to distress. The results of the current study suggest the value of multipronged approaches that seek to not only identify and address symptoms of complicated bereavement, but also couple such interventions with alleviating financial hardship. Layered services, targeted first at addressing chronic stressors before the implementation of specialized clinical services, are certainly one effective approach for clinical interventions. At the same time, it is possible that psychological assistance will be necessary for some individuals who are substantially impaired by complicated bereavement before they are able to take advantage of programs aimed at reducing financial hardship [3]. Based on the salience of War Exposure Losses and Financial Loss and Hardship, integrated interventions aimed at addressing both sources of stressors simultaneously, may be most effective for this war-affected population rather than fragmented interventions designed and implemented in silos. Further exploration of the salient stressors identified in the current study and the implications for specific populations will lend additional insight into clinical intervention and design.

Overall, findings from the current study highlight the importance of theoretical approaches that recognize contextual stressors subsequently leading to clinical interventions that may have more utility. War trauma is of course not without substantial impact and clinical

trauma-based interventions can be hugely beneficial for some populations. However, when it comes to addressing symptoms of distress in situations of chronic adversity, those impacted by war and displacement can additionally benefit from resources targeted towards buffering the impact of modifiable chronic stressors [7].

4.4 Limitations

The findings reported here need to be interpreted considering some methodological limitations. First, the cross-sectional nature of this study limits our understanding of the changes that occur over time and means that the directionality of relationships cannot be unequivocally supported. For example, it is possible that individuals with long-standing PTSD symptom severity were more susceptible to experience war-related stressors or financial loss and hardship. In their study with refugee youth in the United States, Miller and colleagues [115] highlight that "single moment snapshots (i.e., cross-sectional data) are inherently ill-suited to capture the fluid nature of children's reactions to stressful events, the evolution of new coping strategies they utilize at different points in their development, and the shifting nature of stressors themselves" (p. 4). Although referring to the continual state of development for children, this observation applies to identifying chronic stressors for adults. While this study sought to identify chronic stressors prominent for respondents in the month prior to data collection, the inherent nature of stressors is that they can evolve. This is where further research applying the four-factor model in other contexts or as part of longitudinal or multilevel analyses, may provide insightful information regarding the changing nature of stressors and lend further support for an ecological model of stressors and PTSD.

In determining the list of items to include for factor analysis, decisions were theoretically informed, and data driven. Efforts were made for retention of items, yet nine stressor items were

lost for various reasons (e.g., redundancy, poor fit indices). As the initial framework was informed by the results of the qualitative study [40] in combination with data available from the Sociodemographic and Displacement History Questionnaire and the Stressful Life Events Checklist, it is plausible that other unique factors may have emerged if a different analytical approach was applied. Findings from the qualitative study [40] highlighted the significant impact of losing loved ones and property, including ambiguous loss [84]. Although loss of loved ones and property were captured in the above measures, a more nuanced analysis of the relationship between grief and financial strain could further inform intervention design.

Relatedly, the ecological model of stressors and PTSD symptom severity was theoretically informed and based on robust statistical analyses. Nonetheless, items selected for the final model may not be exhaustive as items were constrained by the available data from the COMGAP-S study. Thus, it is possible that the influence of certain stressors in the SEM model were not accounted for, and additionally, may shift over time. As noted, additional stressors may include shifting societal values, changes in social networks and family systems, limited institutional supports, and physical and mental health concerns [40]. Similarly reflected in the literature, Jayawickreme and colleagues found that social problems (e.g., being alone, relocation stress) were central in their network analysis [82]. Continued investigation of stressors with war survivors, particularly using longitudinal approaches may result in a more fulsome understanding of the impact of prolonged stressors on coping capacity.

Of note, the war-related and chronic stressors identified for this model were specific to this adult population of war-survivors in five districts of Northern Sri Lanka. Given the unique experiences across post-conflict zones, generalizability of this model may be uncertain, and findings may have limited external validity. However, as the purpose of this study was to capture

contextualized knowledge of war survivors, placing a microscope on these experiences has value in deepening understanding (Kazdin, 2003). As noted by previous researchers, the generalizability of any SEM model beyond the sample studied is uncertain [116].

In conducting the SEM, it was noted that one item from the HTQ (Item PTSD17, 'excessive guilt') demonstrated a large residual variance (see Figure 1). It is possible that this item presented with a larger residual because it is not well explained by the latent construct of PTSD symptom severity with this group of war-affected participants. Although psychological symptoms and idioms of distress were not an explicit focus of the current study, it was observed that guilt was rarely mentioned as a symptom of psychological distress during interviews. Additionally, when RAs inquired about psychological distress and prompted interviewees with a range of symptoms (i.e., [40]), analysis of transcripts often indicated that participants either denied feelings of guilt (e.g., "Why should I feel guilty?") or attributed feelings of guilt to their limited economic circumstances and inability to provide for their loved ones.

This particular observation is in contrast to a recent study conducted in Sri Lanka with a diverse representation of gender and ethnic groups assessing the modified HTQ in this context. Specifically, the authors found that the modified HTQ, inclusive of item 17 (i.e., "excessive guilt") performed well [117]. Tay and colleagues [117] noted that 21.3% of Tamil participants endorsed this symptom, which was the highest proportion compared to other ethnic groups who participated in the study (i.e., Sinhalese, 3.9%; Moor, 8.3%). Such findings suggest the common presence of the symptom of guilt in this sample. Additional research exploring this symptom further may be beneficial to appropriately target interventions aimed at alleviating trauma symptoms. To note, SEM was also conducted with item 17 removed. As the overall fit of the model did not significantly improve χ^2 (706) = 2296.54, $p < .001$; CFI = 0.901; TLI = 0.892;

RMSEA = .047 (CI, 0.045, 0.049); SRMR = .088, the authors decided to retain the item for consistency with the full scale.

Finally, regarding the unexpected finding of Personal Safety Concerns (i.e., Factor 1) *not* associated with PTSD symptom severity and Personal Hardship (i.e., Factor 4) related to *less* PTSD symptom severity in the full model, it is possible that the observed results may have been due to issues related to the accuracy of participants' reports. As the conflict ended in 2009, the time-lapse between the experiences and participants' reporting of them might influence the stress perception of the war-related and displacement events [118]. Related to this, the limits to self-report measures have been well-documented (e.g., [119]) and it will be important to consider potential bias in memory, information-processing and social desirability [118]. The large sample size of this study and triangulation of quantitative and qualitative data [i.e., 40] are expected to have helped circumvent some issues related to self-report data.

Despite these limitations, the current study is one of few empirical investigations of the relationships between phenomenologically identified stressors and PTSD symptom severity in post-conflict Northern Sri Lanka. Additionally, the analytical approach presented in the current study contributes a foundational framework for identifying and testing the interdependence of stressors in situations of adversity.

5. Conclusions

The results presented here highlight the value of a social ecological model to mental health interventions. The results lend support for the growing movement in global mental health research towards an ecological approach. Beyond simply acknowledging the importance of social and material stressors though, the results of this study capture the unique contribution of *what types* of stressors are related with PTSD symptom severity and how they are related. As

noted by Hou et al. [93], understanding the chronic, everyday life experiences for displaced populations shifts the focus on environment rather than individual-level interventions, subtly having reaching implications for policy and intervention.

Acknowledgements

The current study contributed to the first author's (FCT) doctoral dissertation [11]. The authors gratefully acknowledge and thank the study, research, policy, and clinical staff for their commitment and support of this study. They also thank the study participants for their interest, partnership, and contributions to the current study.

Journal Pre-proof

References

[1] Fazel, M., Reed, R. V., Panter-Brick, C., & Stein, A. (2012). Mental health of displaced and refugee children resettled in high-income countries: Risk and protective factors. *The Lancet*, *379*(9812), 266–282. https://doi.org/10.1016/S0140-6736(11)60051-2.

[2] Porter, M., & Haslam, N. (2005). Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: A meta-analysis. *Journal of the American Medical Association, 294*(5), 602-612. https://doi.org/10.1001/jama.294.5.602

[3] Miller, K. E., & Rasmussen, A. (2017). The mental health of civilians displaced by armed conflict: An ecological model of refugee distress. *Epidemiology and Psychiatric Sciences*, *26*(2), 129–138. https://doi.org/10.1017/S2045796016000172

[4] American Psychiatric Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders, 3rd ed*. APA Press. https://doi.org/10.1176/ajp.137.12.1630.

[5] Summerfield D. (2001). The invention of post-traumatic stress disorder and the social usefulness of a psychiatric category. *BMJ (Clinical research ed.)*, *322*(7278), 95–98. https://doi.org/10.1136/bmj.322.7278.95

[6] Fernando, G. A., Miller, K. E., & Berger, D. E. (2009). Daily stressors in the lives of Sri Lankan youth: a mixed methods approach to assessment in a context of war and natural disaster. *Intervention*, *7*(3), 187–203. https://doi.org/10.1097/wtf.0b013e3283346344.

[7] Miller, K. E., & Rasmussen, A. (2014). War experiences, daily stressors and mental health five years on: Elaborations and future directions. *Intervention*, *12*(1), 33–42.

[8] Boothby, N., Strang, A., & Wessells, M. (Eds.). (2006). *A world turned upside down: Social ecological approaches to children in war zones*. Kumarian Press.

[9] de Jong, J. T. V. M. (Ed.). (2002). *Trauma, War, and Violence: Public Mental Health in*

Journal Pre-proof

Socio-Cultural Context. Kluwer Academic Publishers-Plenum Publishers. https://doi.org/10.1007/0-306-47675-4_1.

[10] Miller, K.E, & Rasco, L. M. (2004). An ecological framework for addressing the mental health needs of refugee communities. In K.E. Miller & L. M. Rasco (Eds.), *The mental health of refugees: Ecological approaches to healing and adaptation.* (pp. 1–64). Lawrence Erlbaum Associates Publishers.

[11] Thomas, F. C. (2021). *The social ecology of displacement: A mixed-method analysis of stressors, trauma and coping in Northern Sri Lanka* [Unpublished doctoral dissertation]. Ryerson University.

[12] Somasundaram, D. (2007). Collective trauma in northern Sri Lanka: A qualitative psychosocial-ecological study. *International Journal of Mental Health Systems*, *1*(1), 5. https://doi.org/10.1186/1752-4458-1-5

[13] Fernando, G. A., Miller, K. E., & Berger, D. E. (2010). Growing pains: The impact of disaster-related and daily stressors on the psychological and psychosocial functioning of youth in Sri Lanka. *Child Development*, *81*(4), 1192–1210. https://doi.org/10.1111/j.1467-8624.2010.01462.x

[14] Tol, W.A., Komproe, I. H., Jordans, M. J. D., Vallipuram, A., Sipsma, H., Sivayokan, S., MacY, R. D., & De Jong, J. T. (2012). Outcomes and moderators of a preventive school-based mental health intervention for children affected by war in Sri Lanka: A cluster randomized trial. *World Psychiatry*, *11*(2), 114–122. https://doi.org/10.1016/j.wpsyc.2012.05.008

[15] Jayawickreme, N., Jayawickreme, E., Atanasov, P., Goonasekera, M. A., & Foa, E. B. (2012). Are culturally specific measures of trauma-related anxiety and depression needed?

Journal Pre-proof

The case of Sri Lanka. Psychological Assessment, 24(4), 791–800. https://doi.org/10.1037/a0027564

[16] Jayawickreme, N., Jayawickreme, E., Goonasekera, M. A., & Foa, E. B. (2009). Distress, wellbeing and war: Qualitative analyses of civilian interviews from north eastern Sri Lanka. *Intervention*, *7*(3), 204–222. https://doi.org/10.1097/wtf.0b013e328334636f

[17] Miller, K. E, Fernando, G. A., & Berger, D. E. (2009). Daily stressors in the lives of Sri Lankan youth: a mixed methods approach to assessment in a context of war and natural disaster. *Intervention*, *7*(3), 187–203. https://doi.org/10.1097/wtf.0b013e3283346344

[18] Galappatti, A. (2014). Trauma and beyond: The evolving field of mental health and psychosocial work in Sri Lanka. In *Scarred communities: Psychosocial impact of man-made and natural disasters on Sri Lankan society* (353–363). SAGE Publications.

[19] Miller, K. E., & Rasmussen, A. (2010). War exposure, daily stressors, and mental health in conflict and post-conflict settings: Bridging the divide between trauma-focused and psychosocial frameworks. *Social Science and Medicine*, *70*(1), 7–16. https://doi.org/10.1016/j.socscimed.2009.09.029

[20] 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. *The Journal of the American Medical Association*, *32*(5), 537–549. https://doi.org/10.1001/jama.2009.1132

[21] Hinton, D. E., & Lewis-Fernandez, R. (2011). *The cross-cultural validity of posttraumatic stress disorder: Implications for DSM-5. 28*(9), 783–801. https://doi.org/10.1002/da.20753

[22] Eisenbruch, M. (1991). From post-traumatic stress disorder to cultural bereavement:

Journal Pre-proof

Diagnosis of Southeast Asian refugees. *Social Science & Medicine (1982)*, *33*(6), 673–680. http://www.ncbi.nlm.nih.gov/pubmed/1957187

[23] Pedersen, D. (2002). Political violence, ethnic conflict, and contemporary wars: Broad implications for health and social well-being. *Social Science & Medicine*, *55*(2), 175–190. https://doi.org/10.1016/S0277-9536(01)00261-1

[24] United Nations High Commissioner for Refugees (UNHCR). (2016). *UNHCR Global Trends: Forced Displacement in 2015*. http://www.unhcr.org/576408cd7

[25] van der Veen, M., & Somasundaram, D. (2006). Responding to the psychosocial impact of the Tsunami in a war zone: Experiences from northern Sri Lanka. *Intervention*, *0*(0), 1–5.

[26] Ponnamperuma, T. & Nicolson, N. A. (2018). The relative impact of traumatic experiences and daily stressors on mental health outcomes in Sri Lankan adolescents. *Journal of Traumatic Stress*, *31*(4), 487–498. https://doi.org/10.1002/jts.22311

[27] World Health Organization. (2018). Mental health ATLAS 2017 member state profile, https://www.who.int/mental_health/evidence/atlas/profiles-2017/LKA.pdf?ua=1

[28] Somasundaram, D. (2014). *Scarred communities: Psychological impact of man-made and natural disasters on Sri Lankan society*. SAGE Publications.

[29] Samarasinghe, G. (2014). Psychosocial interventions in Sri Lanka: Challenges in a post-war environment. In D. Somasundaram (Ed.), *Scarred communities: Psychosocial impact of man-made and natural disasters on Sri Lankan society*. SAGE Publications.

[30] Lustig, S. L., Kia-Keating, M., Knight, W. G., Geltman, P., Ellis, H., Kinzie, J. D., Keane, T., & Saxe, G. N. (2004). Review of child and adolescent refugee mental health. *Journal of the American Academy of Child and Adolescent Psychiatry*, *43*(1), 24–36. https://doi.org/10.1097/00004583-200401000-00012

Journal Pre-proof

[31] Siriwardhana, C., Ali, S. S., Roberts, B., & Stewart, R. (2014). A systematic review of resilience and mental health outcomes of conflict-driven adult forced migrants. *Conflict and Health*, *8*(1), 13. https://doi.org/10.1186/1752-1505-8-13

[32] Tyrer, R. A., & Fazel, M. (2014). School and community-based interventions for refugee and asylum seeking children: A systematic review. *PLoS ONE*, *9*(2), e89359. https://doi.org/10.1371/journal.pone.0089359

[33] Ellis, B. H., MacDonald, H. Z., Lincoln, A. K., & Cabral, H. J. (2008). Mental health of Somali adolescent refugees: The role of trauma, stress, and perceived discrimination. *Journal of Consulting and Clinical Psychology*, *76*(2), 184–193. https://doi.org/10.1037/0022-006X.76.2.184

[34] Miller, K. E., Weine, S. M., Ramic, A., Brkic, N., Bjedic, Z. D., Smajkic, A., Boskailo, E., & Worthington, G. (2002). The relative contribution of war experiences and exile-related stressors to levels of psychological distress among Bosnian refugees. *Journal of Traumatic Stress*, *15*(5), 377–387. https://doi.org/10.1023/A:1020181124118

[35] Sack, W. H., Clarke, G. N., & Seeley, J. (1996). Multiple forms of stress in Cambodian adolescent refugees. *Child Development*, *67*(1), 107–116. https://doi.org/10.1111/j.1467-8624.1996.tb01722.x

[36] Pernice, R., & Brook, J. (1996). Refugees' and immigrants' mental health: Association of demographic and post-immigration factors. *Journal of Social Psychology*, *136*(4), 511–519. https://doi.org/10.1080/00224545.1996.9714033

[37] Gorst-Unsworth, C., & Goldenberg, E. (1998). Psychological sequelae of torture and organised violence suffered by refugees from Iraq: Trauma-related factors compared with social factors in exile. *British Journal of Psychiatry*, *172*, 90–94.

Journal Pre-proof

[38] Michultka, D., Blanchard, E. B., & Kalous, T. (1998). Responses to civilian war experiences: Predictors of psychological functioning and coping. *Journal of Traumatic Stress*, *11*(3), 571–577. https://doi.org/10.1023/A:1024412931068.

[39] Doherty, S., Hulland, E., Lopes-Cardozo, B., Kirupakaran, S., Surenthirakumaran, R., Cookson, S., & Siriwardhana, C. (2019). Prevalence of mental disorders and epidemiological associations in post-conflict primary care attendees: A cross-sectional study in the Northern Province of Sri Lanka. *BMC Psychiatry*, *19*(1), 1–12. https://doi.org/10.1186/s12888-019-2064-0

[40] Thomas, F.C., D'sousa, M., Magwood, O., Thilakanathan, D., Sukumar, V., Doherty, S., Dass, G., Hart, T., Sivayokan, S., Wickramage, K., & McShane K. (2021). Examining post-conflict stressors in Northern Sri Lanka: A qualitative study [Manuscript in-press].

[41] Betancourt, T. S., Newnham, E. A., Layne, C. M., Kim, S., Steinberg, A. M., Ellis, H., & Birman, D. (2012). Trauma history and psychopathology in war-affected refugee children referred for trauma-related mental health services in the United States. *Journal of Traumatic Stress*, *25*(6), 682–690. https://doi.org/10.1002/jts.21749

[42] Husain, F., Anderson, M., Lopes Cardozo, B., Becknell, K., Blanton, C., Araki, D., & Kottegoda Vithana, E. (2011). Prevalence of war-related mental health conditions and association with displacement status in postwar Jaffna District, Sri Lanka. *Journal of the American Medical Association*, *306*(5), 522–531. https://doi.org/10.1001/jama.2011.1052

[43] Siriwardhana, C., Adikari, A., Pannala, G., Siribaddana, S., Abas, M., Sumathipala, A., & Stewart, R. (2013). Prolonged internal displacement and common mental disorders in Sri Lanka: The COMRAID Study. *PLoS ONE*, *8*(5). https://doi.org/10.1371/journal.pone.0064742

Journal Pre-proof

[44] Harvard Humanitarian Initiative. (2015). KoboToolbox (Version 1.4.8 (1057). https://www.kobotoolbox.org/

[45] Brugha, T., Bebbington, P., Tennant, C., & Hurry, J. (1985). The List of Threatening Experiences: A subset of 12 life event categories with considerable long-term contextual threat. *Psychological Medicine*, *15*(1), 189–194.

[46] Suraweera, C., Hanwella, R., Sivayokan, S., & De Silva, V. (2013). Rating scales validated for Sri Lankan populations. *Sri Lanka Journal of Psychiatry*, *4*(2), 16. https://doi.org/10.4038/sljpsyc.v4i2.6320

[47] Cherewick, M., Tol, W., Burnham, G., Doocy, S., & Glass, N. (2016). A structural equation model of conflict-affected youth coping and resilience. *Health Psychology and Behavioral Medicine*, *4*(1), 155–174. https://doi.org/10.1080/21642850.2016.1228458

[48] Muthén, L.K & Muthén, B. (2017). *Mplus Statistical Analysis with Latent Variables User's Guide.* https://www.statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf

[49] Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. International Journal of Economics & Management Science, 6(2), 1-5. doi: 10.4172/2162-6359.1000403

[50] Brown, T. A. (2006). Confirmatory factor analysis for applied research. The Guilford Press.

[51] Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.107.2.238

[52] Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38*, 1-10. https://doi.org/10.1007/BF02291170

[53] Steiger, J. H., & Lind, J. C. (1980). Statistically-based tests for the number of common

Journal Pre-proof

factors. Paper presented at the annual Spring Meeting of the Psychometric Society in Iowa City.

[54] Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6,* 1-55. doi: 10.1080/10705519909540118

[55] Blunch, N. J. (2013). *Introduction to structural equation modeling using IBM SPSS statistics and AMOS*. SAGE.

[56] Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, *6*(1), 53–60.

[57] Browne, M. W., & Cudeck, R. (1992). Alternative Ways of Assessing Model Fit. *Sociological Methods & Research, 21*(2), 230-258. https://doi.org/10.1177/0049124192021002005

[58] Barendse, M. T., Oort, F. J., & Timmerman, M. E. (2015). Using exploratory factor analysis to determine the dimensionality of discrete responses. *Structural Equation Modeling*, *22*(1), 87–101. https://doi.org/10.1080/10705511.2014.934850

[59] Muthén, B., & Kaplan, D. (1985). A comparison of some methodologies for the factor analysis of non-normal Likert variables. *British Journal of Mathematical and Statistical Psychology*, *38*(2), 171–189. https://doi.org/10.1111/j.2044-8317.1985.tb00832.x

[60] Muthén, B., & Asparouhov Mplus, T. (2015). *Latent variable interactions*. www.statmodel.com

[61] Brown, J. D. (2009). Statistics Corner. Questions and answers about language testing statistics: Choosing the right number of components or factors in PCA and EFA. Shiken:

Journal Pre-proof

JALT Testing & Evaluation SIG Newsletter, 13(2), 19-23. Retrieved from http://jalt.org/test/bro_30.htm

[62] Hutchens, M. J. (2017). Nested Model Comparison. *The International Encyclopedia of Communication Research Methods*, p. 1–2 https://doi.org/10.1002/9781118901731.iecrm0166

[63] Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272–299. https://doi.org/10.1037/1082-989X.4.3.272

[64] Schmitt, T. A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment*, *29*(4), 304–321. https://doi.org/10.1177/0734282911406653

[65] Ferrando, P. J., & Lorenzo-Seva, U. (2017). Program FACTOR at 10: Origins, development and future directions. *Psicothema*, *29*(2), 236–240. https://doi.org/10.7334/psicothema2016.304

[66] Timmerman, M. E., & Lorenzo-Seva, U. (2011). Dimensionality assessment of ordered polytomous items with parallel analysis. *Psychological Methods, 16*(2), 209-220. https://doi.org/10.1037/a0023353

[67] Kuder, G. F., & Richardson, M. W. (1937). The theory of the estimation of test reliability. *Psychometrika*, *2*(3), 151–160. https://doi.org/10.1007/BF02288391

[68] Ritter, N. L. (2010, February 18). *Understanding a Widely Misunderstood Statistic: Cronbach's α*. Paper presented at the annual meeting of the Southwest Educational Research Association, New Orleans

[69] Kline, R. B., & Santor, D. A. (1999). Principles & practice of structural equation

Journal Pre-proof

modelling. Canadian Psychology, 40(4), 381–427.

[70] Gorsuch, R. L. (2015). Introduction to the Classic Edition. In *Factor Analysis: Classic Edition* (pp. xviii–xx). Routledge.

[71] Petras, H., & Masyn, K. (2010). General Growth Mixture Analysis with Antecedents and Consequences of Change. In A. Piquero & D. Weisburd (Eds.), *Handbook of Quantitative Criminology* (pp. 69–100). Springer-Verlag. https://doi.org/10.1007/978-0-387-77650-7_5

[72] How can I compute a chi-squared test for nested models with the MLMV or WLSMV estimators (difftest)? | Mplus FAQ. (n.d.). Retrieved January 29, 2020, from https://stats.idre.ucla.edu/mplus/faq/how-can-i-compute-a-chi-squared-test-for-nested-models-with-the-mlmv-or-wlsmv-estimators-difftest/

[73] Bowen, N. K. (2017). *Chi Square Difference Testing in Mplus with WLSMV Estimation*. https://cpb-us-w2.wpmucdn.com/u.osu.edu/dist/b/73637/files/2020/01/DifftestMplus2017.pdf

[74] Cabrera-Nguyen, E.P. (2010) Author guidelines for reporting scale development and validation results in the journal of the society for social work and research. *Journal of the Society for Social Work and Research, 1*, 99-103.

[75] El-Uri, F. I., & Malas, N. (2013). Analysis of use of a single best answer format in an undergraduate medical examination. *Qatar Medical Journal*, *2013*(1), 3–6. https://doi.org/10.5339/qmj.2013.1

[76] Salkind, N. (2012). *Encyclopedia of Research Design*. SAGE Publications, Inc. https://doi.org/10.4135/9781412961288

[77] Glen, S. (2016). *Kuder-Richardson 20 (KR-20) & 21 (KR-21) - Statistics How To*. From StatisticsHowTo.Com: Elementary Statistics for the Rest of Us!

Journal Pre-proof

Https://Www.Statisticshowto.Com/Kuder-Richardson/

[78] Hulin, C., Netemeyer, R. G., & Cudeck, R. (2000). Can a reliability coefficient be too high? *Journal of Consumer Psychology*, *10*(1), 55–58. https://doi.org/10.2307/1480474

[79] Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality*, *54*(1), 106–148. https://doi.org/10.1111/j.1467-6494.1986.tb00391.x

[80] Brannick, M. T. (n.d.). *Structural Equation Modeling (SEM)*. Structural Equation Modeling (SEM). Retrieved March 8, 2020, from http://faculty.cas.usf.edu/mbrannick/regression/SEM.html

[81] Riley, A., Varner, A., Ventevogel, P., Taimur Hasan, M. M., & Welton-Mitchell, C. (2017). Daily stressors, trauma exposure, and mental health among stateless Rohingya refugees in Bangladesh. *Transcultural Psychiatry*, *54*(3), 304–331. https://doi.org/10.1177/1363461517705571

[82] Jayawickreme, N., Mootoo, C., Fountain, C., Rasmussen, A., Jayawickreme, E., & Bertuccio, R. F. (2017). Post-conflict struggles as networks of problems: A network analysis of trauma, daily stressors and psychological distress among Sri Lankan war survivors. *Social Science and Medicine*, *190*, 119–132. https://doi.org/10.1016/j.socscimed.2017.08.027

[83] Wells, R., Lawsin, C., Hunt, C., Said Youssef, O., Abujado, F., & Steel, Z. (2018). An ecological model of adaptation to displacement: Individual, cultural and community factors affecting psychosocial adjustment among Syrian refugees in Jordan. *Global Mental Health*, *5*, e42. https://doi.org/10.1017/gmh.2018.30

[84] Boss, P. (2004). Ambiguous Loss Research, Theory, and Practice: Reflections after 9/11. *Journal of Marriage and Family Therapy*, *66*(3), 551–566. https://doi.org/10.1111/j.0022-

Journal Pre-proof

2445.2004.00037.x

[85] Dobricki, M., Komproe, I. H., De Jong, J. T. V. M., & Maercker, A. (2010). Adjustment disorders after severe life-events in four postconflict settings. *Social Psychiatry and Psychiatric Epidemiology*, *45*(1), 39–46. https://doi.org/10.1007/s00127-009-0039-z

[86] Letica-Crepulja, M., Salcioglu, E., Frančišković, T., & Basoglu, M. (2011). Factors associated with posttraumatic stress disorder and depression in war-survivors displaced in Croatia. *Croatian Medical Journal*, *52*(6), 709–717. https://doi.org/10.3325/cmj.2011.52.709

[87] Beiser, M., Johnson, P. J., & Turner, R. J. (1993). Unemployment, underemployment and depressive affect among southeast asian refugees. *Psychological Medicine*, *23*, 731–743. https://doi.org/10.1017/S0033291700025502

[88] Thomas, F. C., Roberts, B., Luitel, N. P., Upadhaya, N., & Tol, W. A. (2011). Resilience of refugees displaced in the developing world: A qualitative analysis of strengths and struggles of urban refugees in Nepal. *Conflict and Health*, *5*(1), 20. https://doi.org/10.1186/1752-1505-5-20

[89] Silove, D., Sinnerbrink, I., Field, A., Manicavasagar, V., & Steel, Z. (1997). Anxiety, depression and PTSD in asylum-seekers: Associations with pre-migration trauma and post-migration stressors. *British Journal of Psychiatry*, *170*(APR.), 351–357. https://doi.org/10.1192/bjp.170.4.351

[90] Priebe, S., Jankovic Gavrilovic, J., Bremner, S., Ajdukovic, D., Franciskovic, T., Galeazzi, G. M., Kucukalic, A., Lecic-Tosevski, D., Morina, N., Popovski, M., Schtzwohl, M., & Bogic, M. (2012). Psychological aymptoms as long-term consequences of war experiences. *Psychopathology*, *46*, 45–54. https://doi.org/10.1159/000338640

[91] Rasmussen, A., Nguyen, L., Wilkinson, J., Vundla, S., Raghavan, S., Miller, K. E., &

Journal Pre-proof

Keller, A. S. (2010). Rates and impact of trauma and current stressors among Darfuri refugees in Eastern Chad. *American Journal of Orthopsychiatry*, *80*(2), 227–236. https://doi.org/10.1111/j.1939-0025.2010.01026.x

[92] Tay, A. K., Rees, S., Chen, J., Kareth, M., Lahe, S., Kitau, R., David, K., Sonoling, J., & Silove, D. (2015). Associations of conflict-related trauma and ongoing stressors with the mental health and functioning of West Papuan Refugees in Port Moresby, Papua New Guinea *PLOS ONE*, *10*(4), e0125178. https://doi.org/10.1371/journal.pone.0125178

[93] Hou, W. K., Liu, H., Liang, L., Ho, J., Kim, H., Seong, E., Bonanno, G. A., Hobfoll, S. E., & Hall, B. J. (2020). Everyday life experiences and mental health among conflict-affected forced migrants: A meta-analysis. *Journal of Affective Disorders*, *264*(1), 50–68. https://doi.org/10.1016/j.jad.2019.11.165

[94] Jayawickreme, N., Atefi, E., Jayawickreme, E., Qin, J., & Gandomi, A. H. (2020). Association rule learning is an easy and efficient method for identifying profiles of traumas and stressors that predict psychopathology in disaster survivors: The example of Sri Lanka. *International Journal of Environmental Research and Public Health*, *17*(8), 2850. https://doi.org/10.3390/ijerph17082850

[95] Jayasuriya, D., Jayasuriya, R., Tay, A. K., & Silove, D. (2016). Associations of mental distress with residency in conflict zones, ethnic minority status, and potentially modifiable social factors following conflict in Sri Lanka: A nationwide cross-sectional study. *The Lancet Psychiatry*, *3*(2), 145–153. https://doi.org/10.1016/S2215-0366(15)00437-X

[96] Nickerson, A., Liddell, B., Asnaani, A., Carlsson, J., Fazel, M., Knaevelsrud, C., Morina, N., Neuner, F., Newnham, E., & Rasmussen, A. (2017). *Trauma and mental health in forcibly displaced populations: An International Society for Traumatic Stress Studies*

Journal Pre-proof

Briefing Paper. International Society for Traumatic Stress Studies. https://www.istss.org/getattachment/Education-Research/Briefing-Papers/Trauma-and-Mental-Health-in-Forcibly-Displaced-Pop/Displaced-Populations-Briefing-Paper_Final.pdf.aspx

[97] Barber, B. K. (2013). Annual research review: The experience of youth with political conflict - Challenging notions of resilience and encouraging research refinement. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *54*(4), 461–473. https://doi.org/10.1111/jcpp.12056

[98] Masten, A. S. (2014). Global perspectives on resilience in children and youth. *Child Development*, *85*(1), 6–20. https://doi.org/10.1111/cdev.12205

[99] Crane, M. F., Kangas, M., Karin, E., Searle, B., & Chen, D. (2020). Leveraging the experience of stressors: the role of adaptive systematic self-reflection. *Anxiety, stress, and coping*, *33*(3), 231–247. https://doi.org/10.1080/10615806.2020.1732359

[100] Tedeschi, R. G., & Calhoun, L. G. (2004). Target Article: "Posttraumatic Growth: Conceptual Foundations and Empirical Evidence". *Psychological Inquiry, 15*(1), 1–18. https://doi.org/10.1207/s15327965pli1501_01

[101] Shamia, N. A., Thabet, A. A., & Vostanis, P. (2015). Exposure to war traumatic experiences, post-traumatic stress disorder and post-traumatic growth among nurses in Gaza. *Journal of psychiatric and mental health nursing*, *22*(10), 749–755. https://doi.org/10.1111/jpm.12264

[102] Bitton, M. S., & Laufer, A. (2017). PTSD and PTG among Israeli mothers: Opposite facets of exposure to terrorism. *Stress and Health: Journal of the International Society for the Investigation of Stress, 33*(5), 676–683. https://doi.org/10.1002/smi.2754

Journal Pre-proof

[103] Somasundaram, D., & Sivayokan, S. (2013). Rebuilding community resilience in a post-war context: Developing insight and recommendations - A qualitative study in Northern Sri Lanka. *International Journal of Mental Health Systems*, *7*(3). https://doi.org/10.1186/1752-4458-7-3

[104] Gwozdziewycz, N., & Mehl-Madrona, L. (2013). Meta-analysis of the use of narrative exposure therapy for the effects of trauma among refugee populations. *The Permanente Journal*, *17*(1), 70–76. https://doi.org/10.7812/TPP/12-058

[105] Hinton, D. E., Rivera, E. I., Hofmann, S. G., Barlow, D. H., & Otto, M. W. (2012). Adapting CBT for traumatized refugees and ethnic minority patients: Examples from culturally adapted CBT (CA-CBT). *Transcultural Psychiatry*, *49*(2), 340–365. https://doi.org/10.1177/1363461512441595

[106] Patel, N., Kellezi, B., & Williams, A. C. d. C. (2014). Psychological, social and welfare interventions for psychological health and well-being of torture survivors. *Cochrane Database of Systematic Reviews*, *11*, CD009317. https://doi.org/10.1002/14651858.CD009317.pub2

[107] Lambert, J. E., & Alhassoon, O. M. (2014). Trauma-focused therapy for refugees: Meta-analytic findings. *Journal of Counseling Psychology*, *62*(1), 28–37. https://doi.org/10.1037/cou0000048

[108] Murray, K. E., Davidson, G. R., & Schweitzer, R. D. (2010). Review of refugee mental health interventions following resettlement: Best practices and recommendations. *American Journal of Orthopsychiatry*, *80*(4), 576–585. https://doi.org/10.1111/j.1939-0025.2010.01062.x

[109] Blas, E., & Sivasankara Kurup, A. (2010). *Equity, social determinants and public health*

Journal Pre-proof

programmes. World Health Organization (WHO). https://apps.who.int/iris/handle/10665/44289

[110] Lund, C., Brooke-Sumner, C., Baingana, F., Baron, E. C., Breuer, E., Chandra, P., Haushofer, J., Herrman, H., Jordans, M., Kieling, C., Medina-Mora, M. E., Morgan, E., Omigbodun, O., Tol, W., Patel, V., & Saxena, S. (2018). Social determinants of mental disorders and the Sustainable Development Goals: A systematic review of reviews. *The Lancet Psychiatry*, *5*(4), 357–369. https://doi.org/10.1016/S2215-0366(18)30060-9

[111] Goodkind, J. R., Hess, J. M., Isakson, B., LaNoue, M., Githinji, A., Roche, N., Vadnais, K., & Parker, D. P. (2014). Reducing refugee mental health disparities: A community-based intervention to address postmigration stressors with African adults. *Psychological Services*, *11*(3), 333–346. https://doi.org/10.1037/a0035081

[112] Kinzie, J. D., & Fleck, J. (1987). Psychotherapy with severely traumatized refugees. *American Journal of Psychotherapy*, *41*(1), 82–94. https://doi.org/10.1176/appi.psychotherapy.1987.41.1.82

[113] Miller, K.E. (1999). Rethinking a familiar model: Psychotherapy and the mental health of refugees. *Journal of Contemporary Psychotherapy*, *29*, 283–306. https://doi.org/10.1023/A:1022926721458

[114] Inter-Agency Standing Committee. (2007). IASC guidelines on mental health and psychosocial support in emergency settings, https://www.who.int/mental_health/emergencies/guidelines_iasc_mental_health_psychosocial_june_2007.pdf

[115] Miller, K. E., McCall, J., Martell, Z., & Kushner, H. (2008). Psychosocial challenges facing children of refugee families in the United States. In J. Hart (ed.), *Years of conflict:*

Journal Pre-proof

Adolescence, political violence and displacement (pp. 55-86). London: Berghahn Books

[116] Aiken, L. S., Stein, J. A., & Bentler, P. M. (1994). Structural Equation Analyses of Clinical Subpopulation Differences and Comparative Treatment Outcomes: Characterizing the Daily Lives of Drug Addicts. *Journal of Consulting and Clinical Psychology*, *62*(3), 488–499. https://doi.org/10.1037/0022-006X.62.3.488

[117] Tay, A. K., Jayasuriya, R., Jayasuriya, D., & Silove, D. (2017). Assessing the factorial structure and measurement invariance of PTSD by gender and ethnic groups in Sri Lanka: An analysis of the modified Harvard Trauma Questionnaire (HTQ). *Journal of Anxiety Disorders*, *47*, 45–53. https://doi.org/10.1016/j.janxdis.2017.02.001

[118] Vindevogel, S., de Schryver, M., Broekaert, E., & Derluyn, I. (2013). War-related experiences of former child soldiers in northern Uganda: Comparison with non-recruited youths. Paediatrics and International Child Health, 33(4), 281–291. https://doi.org/10.1179/2046905513Y.0000000084

[119] Metts, S., Sprecher, S., & Cupach, W. R. (1991). Retrospective self-reports. In B. M. Montgomery & S. Duck (Eds.), Guilford communication series: Studying interpersonal interaction (pp 162–178). Guilford Press.

Journal Pre-proof

Journal Pre-proof

Displacement-Related Stressors in a Sri Lankan War-affected Community: Identifying the Impact of War Exposure and Ongoing Stressors on Trauma Symptom Severity

Fiona C. Thomas[a*], Simon Coulombe[b], Todd A. Girard[a], Tae L. Hart[a], Shannon Doherty[c], Giselle Dass[d], Kolitha Wickramage[e], Chesmal Siriwardhana [f ¶], Rajendra Surenthirakumaran[g], Kelly McShane[a]

[a] Department of Psychology, Faculty of Arts, Ryerson University. 350 Victoria St. Toronto, Ontario, M5B 2K3, Canada. fiona.thomas@ryerson.ca; todd.girard@ryerson.ca; tae.hart@ryerson.ca; kmcshane@ryerson.ca

[b] Department of Industrial Relations, Université Laval. J.-A.-DeSève Pavilion, 3rd floor 1025, avenue des Sciences-Humaines, Québec, G1V 0A6, Canada. simon.coulombe@rlt.ulaval.ca

[c] School of Allied Health, Faculty of Health, Education, Medicine & Social Care, Anglia Ruskin University. Bishop Hall Lane, Chelmsford, Essex, CM1 1SQ, United Kingdom. shannon.doherty@aru.ac.uk

[d] THEME Institute. 50, 13 Old Kesbewa Rd, Boralesgamuwa, Sri Lanka, giss.dass@gmail.com

[e] International Organization for Migration (IOM), United Nations Migration Agency. Migration Health Division, Geneva, Switzerland. Migration Health Division, Global Migration Health Support. Unit 8741 Paseo De Roxas Makati City 1226 Manila, Philippines. kwickramage@iom.int

[f] Global Mental Health London School of Hygiene and Tropical Medicine. Keppel Street, London WC1E 7HT, United Kingdom.

[g] Department of Family and Community Medicine, Faculty of Medicine, University of Jaffna. Adiyapatham Road, Kokuvil, Jaffna, Sri Lanka.

[*] Corresponding author

[¶] CS passed away prior to the completion of the current study. He was the Primary Investigator of the parent study, COMGAP-S.

Conflict of Interest Statement: The authors have declared that no competing interests exist.

Journal Pre-proof