Social Psychiatry and Psychiatric Epidemiology (2021) 56:1015–1023
https://doi.org/10.1007/s00127-020-02010-8

ORIGINAL PAPER

The relationship of pre- and post-resettlement violence exposure to mental health among refugees: a multi-site panel survey of somalis in the US and Canada

Carmel Salhi[1,2] · Arielle A. J. Scoglio[1] · Heidi Ellis[3] · Osob Issa[3] · Alisa Lincoln[2]

Received: 17 April 2020 / Accepted: 7 December 2020 / Published online: 4 January 2021

Abstract

Background A large body of research highlights the lasting impact of pre-resettlement violence on the mental health of refugees after resettlement. However, there is limited research on violence exposure after resettlement and its association with mental health. We examine the association of pre- and post-resettlement violence with post-resettlement mental health symptoms in a survey of Somali refugees in the US and Canada.

Methods and findings We collected survey data from 383 Somalis across five cities in the US and Canada (Boston, MA; Minneapolis, MN; Lewiston, NC; Portland, ME; Toronto, Canada). Wave 1 data were collected between May 2013 and January 2014, while Wave 2 was collected between June 2014 and August 2015. Data from both waves were used to examine whether the association of past violence exposures persists across time and with more recent violence exposures. The War Trauma Screening Scale assessed exposure to any pre- and post-resettlement violence at Wave 1, while the My Exposure to Violence scale assessed any past-year violence exposure at Wave 2. Mental health outcomes included symptoms of depression and anxiety (Hopkins Symptom Checklist) and post-traumatic stress symptoms (Harvard Trauma Questionnaire). Separate linear regression models at Waves 1 and 2 examined the relationship of past violence exposure to standardized scores of mental health symptoms. Participants were 22 years of age, on average. Fifty-six percent of our sample had been exposed to violence after resettlement by Wave 2. At Wave 1, the associations of pre- and post-resettlement violence with mental health were comparable in magnitude across depression [β = 0.39, 95% CI (0.21 0.57) vs. β = 0.36, 95% CI (0.10 0.62)], anxiety [β = 0.33, 95% CI (0.12 0.55) vs. β = 0.38, 95% CI (0.01 0.75)], and PTSD [β = 0.55, 95% CI (0.37 0.72) vs. β = 0.47, 95% CI (0.21 0.74)]. At Wave 2, pre-resettlement violence was associated with depressive symptoms only [β = 0.23, 95% CI (0.06 0.40)], while past-year exposure to violence had the largest association with all mental health outcomes [depression: β = 0.39, 95% CI (0.17 0.62); anxiety: β = 0.46, 95% CI (0.01 0.75); PTSD: β = 0.67, 95% CI 0.46 0.88)].

Conclusions Our study is the first to examine refugees' exposure to post-resettlement violence across time, finding that Somali refugees' exposure is both persistent and prevalent after resettlement. Post-resettlement violence had a larger association with mental health than pre-resettlement exposure by Wave 2. Our study highlights the urgent need to understand the role of post-resettlement violence exposure for refugees in the US and Canada.

Keywords Refugee · Mental health · Violence exposure · Resettlement

Background

A large body of research points to the lasting impact of pre-resettlement violence exposure and violence-related experiences on the mental health of refugees after resettlement [1–4]. Multiple exposures to violence and trauma have a cumulative impact on mental health in resettled refugee populations [5, 6]. Relatedly, there is evidence that levels of emotional distress often do not dissipate for refugees after they have been resettled [7, 8]. In a study of

✉ Carmel Salhi
c.salhi@northeastern.edu

1 Bouvé College of Health Sciences, Northeastern University, Boston, MA, USA

2 Institute of Health Equity and Social Justice Research, Northeastern University, Boston, MA, USA

3 Department of Psychiatry, Boston Children's Hospital and Harvard Medical School, Boston, USA

refugees resettled in Australia, individuals had higher levels of depression and anxiety based on longer periods in the country [7]. However, there are very few studies examining the relationship of violence after resettlement with refugee mental health, despite suggestive evidence that they continue to be at risk for such exposure.

In countries of resettlement, refugees are frequently placed in poorer neighborhoods where they are more likely to be exposed to community violence [3, 9]. In a review by Fazel, Reed, Panter-Brick, and Stein, direct and indirect exposure to violence after resettling in a high-income country was associated with range of negative mental health outcomes in four studies [10]. However, these studies often used measures which conflated violent experiences in resettlement with non-violent traumatic events or daily stressors (e.g., lack of access to healthcare) [11]. In one of the few studies that explicitly measured violence, Marshall and colleagues found a very high prevalence of post-resettlement violence exposure (70%, $N=586$) among Cambodian refugees in Long Beach, California [3]. For these refugees, violence after resettlement and war-related experiences posed similar risks to the development of Posttraumatic Stress Disorder (PTSD) and depression. In a separate study of Khmer adolescent refugees, there were a greater number of violent experiences after resettling to the US than prior to resettlement, which placed them at higher risk for PTSD and depression symptoms [12]. However, both studies were conducted in a single city and did not follow participants over time, making it challenging to transport these findings to other areas of resettlement or understand the effects of repeated violence exposures.

As refugees often face extensive histories of violence exposure, additional, repeated violence after resettlement may place them at substantially increased risk for PTSD and depression [13–15]. Indeed, violence exposure after resettlement in the US may be even more common than prior to resettlement [3, 12]. Repeated exposures to violence may help to explain why resettled refugees have higher rates and chronicity of symptoms of mental illness as compared to the general population. Resettled refugees are about ten times more likely to have PTSD than age-matched general populations in the countries in which they were resettled, with comorbidity of depression and PTSD being very common [16]. While past studies examining refugee mental health often use trauma measures that combine non-violent and violent exposures, violent experiences may operate through distinct developmental mechanisms, disrupting emotion regulation, attention skills, positive self-perception, and interpersonal attachments [17, 18]. Furthermore, violence may impact resettled refugee's mental health well beyond post-traumatic symptoms [19–21]. Violence's distinct mechanisms and effects on mental health underscore the importance of examining it separately rather than subsumed as an exposure within a trauma-centered framework.

Somali refugees began resettling in the United States in 1991, fleeing civil war and widespread violence in their home country. Over the past 2 decades, estimated 150,000 Somalis have resettled in the U.S. and 63,000 in Canada [22, 23]. Despite migrating in search of safety, many Somalis resettled in communities where community violence continues to impact their experiences in the US and Canada [24, 25]. Minneapolis, home to the largest Somali population in the U.S., has struggled with gang violence, including Somali gangs [26]. Within Toronto, gun violence affecting Somali youth has been called a crisis [27]. In a recent qualitative examination of how Somali young adults think about and understand violence in their communities, gang violence in their community was identified as a major concern [25].

The nascent evidence that violence exposure continues after resettlement, in combination with the chronicity of mental illness among refugees, suggests an urgent need to explicitly examine violence both pre- and post-resettlement. Specifically, the current study's aims contribute to the literature in three important ways: (1) we explicitly focus on violent experiences; (2) we describe the prevalence of post-resettlement violent experiences in a sample of Somali refugees drawn from multiple sites in the US and Canada; (3) we examine the association of violence exposure both before and after resettlement with PTSD, anxiety, and depression symptoms after resettlement. We examine both pre- and post-resettlement violence exposure concurrently to better parse the association of each with refugees' mental health after resettlement.

Methods

CBPR approach

Community-Based Participatory Research (CBPR) is an approach that involves a partnership between academic and community stakeholders in which the needs, capacity, and knowledge of the community of study are central to the research [28]. The current study builds on an 18-year CBPR program which included a longitudinal study among young Somali refugees (the Somali Youth Longitudinal Study, SYLS). Somali research partners identified study sites and were part of the team which developed the research protocol. Community partnerships were formed in each city where the research was going to take place. The study was approved by the Institutional Review Board of Boston Children's Hospital, Northeastern University (U.S.), and Carleton University (Canada). While the content for data collection, data collection procedures, and sampling followed CBPR principles,

the current study is a secondary analysis of the data collected from this CBPR program.

Sampling procedure

Refugees have been described as 'hidden' communities that are difficult, if not impossible, to sample randomly [29]. To overcome these barriers and reach as many community members as possible, we recruited participants using purposive sampling through social networks and collaboration with our community partners [30]. These sampling methods helped to broaden our study population to reflect variation in socioeconomic statuses, tribal affiliations, and levels of religiosity (see additional detail elsewhere on the sampling methods used [31]). To be eligible to participate, participants had to have lived in the U.S. or Canada for at least 1 year, were of Somali descent, and were between the age of 18 and 30. To examine pre-resettlement exposure for the purposes of this study, we further limited the sample to those who were born outside of North America. Fewer than 2% of individuals who came to the interview site to receive information about the project chose not to participate in the study. Data at Wave 1 were collected between May 2013 and January 2014, while Wave 2 was collected between June 2014 and August 2015.

Final sample

Our sample consisted of 383 participants at Wave 1 or 2 from five North American communities: Boston, MA ($n=125$), Minneapolis, MN ($n=122$), Portland, ME ($n=40$), Lewiston, NC ($n=63$), and Toronto, Canada ($n=33$). Retention of participants from Wave 1 to Wave 2 was 88%. Additional 45 participants were recruited at Wave 2 who were not at Wave 1 to make up for loss to follow-up; these participants did not differ significantly from participants present at both waves in either their exposure to violence or mental health symptoms. At a significance level of 0.05, power of 0.8, and outcomes standardized to a mean of 0 and standard deviation of 1, our minimum detectable effect size with a sample of 383 is 0.29.

Data collection

The Somali Youth Longitudinal Study, from which the survey data for this study are drawn, focused on risk and protective factors for diverse outcomes among Somali young adults living in North America [32]. Somali-American staff members were responsible for recruitment and informed consent. To reduce social desirability bias, non-Somali research assistants administered the survey interviews and consulted with a Somali cultural broker if assistance with communication was needed. Interviews were conducted in English unless translation by the cultural broker was needed. All responses were anonymized and uploaded to a secure database.

Measures

Violence exposure

At Wave 1, exposure to violence both prior to and after resettlement was captured using the version of the War Trauma Screening Scale (WTSS) adapted to and validated among Somali refugees [33–35]. The original WTSS is an 18-item self-report checklist of violence and adversity experienced in the context of war exposure. We used only the 11 items which dealt with violence exposure specifically (e.g., being robbed with the use of a weapon, being sexually violated, witnessing armed combat, etc.), so that items with ambiguous meaning were excluded, such as any death of a loved one or being separated from family. Participants were asked whether they had experienced each specific type of violent event and whether the event occurred prior to resettlement or in the US. The WTSS was coded into two separate binary exposure variables: (1) any pre-resettlement violence exposure (yes = 1/no = 0); (2) any post-resettlement violence exposure in the US (yes = 1/no = 0).

Exposure to violence at Wave 2 was captured using the My Exposure to Violence (MEV) scale [36, 37]. Participants were asked whether they have been exposed to different types of violence or violent events in the past year (i.e., "In the past year, have you seen someone get shot at?"). Through conversations with Somali research staff and community leaders, this checklist was first adapted to increase its relevance for Somali young adults, resulting in 18 items. Given this study's focus on violence, four items were excluded from the original 14-item scale which did not explicitly capture a violent event: being in a serious accident where someone else was hurt; being in a serious accident where the respondent was hurt; a natural disaster; being afraid of harm to self or others in an unspecified circumstance not previously covered. Responses were coded as a binary exposure variable at Wave 2 for any exposure in the past year (yes = 1/no = 0).

Hopkins symptom checklist (HSCL-25)

The Hopkins Symptom Checklist 25-item scale assesses symptoms of anxiety (10 items, e.g., "Have you felt faintness, dizziness, or weakness?") and depression (14 items, excluding suicidal ideation, e.g., "Have you been feeling hopeless about the future?") that may have occurred in the past month [38]. Based on feedback from community advisors, the item assessing suicidal ideation was removed, because suicide is culturally and religiously proscribed and asking this item may have resulted in drop-out or social

desirability bias. The HSCL has both demonstrated measurement invariance across refugee populations and been validated specifically within Somali refugee populations [39–41]. Responses to each question about symptoms ranged from 1 (not at all) to 4 (extremely). The HSCL anxiety subscale had a Cronbach's alpha of 0.87 at Wave 1 and 0.86 at Wave 2. The HSCL depression subscale had a Cronbach's alpha of 0.90 at Wave 1 and 0.91 at Wave 2. The depression and anxiety subscales were coded separately as standardized scores, with a mean of 0 and standard deviation of 1.

Harvard trauma questionnaire (HTQ)

The Harvard Trauma Questionnaire (HTQ) was used to assess PTSD symptoms that may have occurred in the past week [42]. For example, one question is, "In the past week have you had recurrent thoughts or memories of the most hurtful or terrifying events?" with answer responses ranging from 1 (not at all) to 4 (extremely). The HTQ has demonstrated high internal consistency in previous studies of refugees and has been validated in multiple countries and cultures [41]. Both the HSCL-25 and HTQ have been shown to be interpreted similarly across a wide range of refugee groups, indicating that they can be applied in non-western refugee populations; however, care should be taken to not compare scores across groups or use diagnostic cutoffs not developed for a specific population [41, 43]. The HTQ had a Cronbach's alpha of 0.90 at Wave 1 and 0.89 at Wave 2. The HTQ score was standardized with mean of 0 and standard deviation of 1.

Control variables

The respondent's self-reported gender and number of years living in the US or Canada were included as control variables, in addition to binary indicator variables for city of residence.

Analysis

Our analysis consisted of three steps. First, to describe characteristics of our sample, we provide univariate statistics using mean and standard deviation for continuous variables and percentages for binary variables. Second, to describe the prevalence of violence exposure among our sample of refugees at multiple stages of resettlement, we provide a cross-tabulation of the percentage of refugees exposed to any violence before and after resettlement.

Third, to assess the association of violence exposure with mental health, separate linear regression models were implemented with PTSD, depression, and anxiety as dependent variables for data at Wave 1 and again for data at Wave 2, for a total of 6 regression models. Regression models at Wave 1 had pre-resettlement violence exposure and post-resettlement violence exposure as independent variables. Models at Wave 2 had pre-resettlement violence exposure, post-resettlement violence exposure up to Wave 1, and past-year violence exposure preceding Wave 2 as independent variables. Regressions controlled for gender and number of years in the US or Canada to account for potential confounding in the relationship between violence and mental health. Models also used fixed effects to account for potential heterogeneity of effects by city of residence (with Boston, the largest group, as the reference) and clustered standard errors by city to account for clustering in violence exposure or mental health outcomes. Maximum likelihood with missing values was used to account for any missing variables [44]. All analyses were conducted in Stata 14 [45].

Results

Background characteristics of participants

Table 1 provides a description of the sample at Wave 1 of the data collection. The majority of the sample are citizens of the US or Canada (70%) and have been in either country for 13 years. On average, respondents were 21 years of age, with a majority identifying as men (60%).

Prevalence of violence exposure

Table 2 provides a description of violence exposure in this sample. At all three time-points (i.e., pre-resettlement, post-resettlement at Wave 1, and past-year exposure at Wave 2), more than 40% of the sample had been exposed to violence. Among the items which constitute the binary indicators of violence exposure, the most common types of pre-resettlement violence exposure at Wave 1, as captured by the WTSS, were being forced to leave one's home (29%),

Table 1 Descriptive statistics of sample[a]

Female (%)	40.25%
Age	21.96 (3.08)
Years in US or Canada	11.42 (5.41)
Citizenship status (%)	69.73%
HSCL anxiety mean score[b]	1.30 (0.45)
HSCL depression mean score	1.39 (0.52)
HTQ mean score	1.33 (0.44)

HSCL Hopkins symptom checklist, *HTQ* Harvard trauma questionnaire

[a]Descriptive statistics (percentages or means with standard deviations) presented at first wave of data collection

[b]Mean item score at Wave 1, on a scale from "1, Not at all" to "4, Extremely"

Table 2 Prevalence of violence exposure prior to resettlement and at Waves 1 and 2

Experienced violence prior to resettlement[a]	53.43%
Exposure to violence after resettlement, Wave 1	40.24%
Exposure to violence in past year after resettlement, Wave 2	59.55%

[a]Violence exposure prior to resettlement and after resettlement measured at Wave 1 by war trauma screening scale; past year violence at Wave 2 measured by my exposure to violence scale

Table 3 Prevalence of violence exposure, prior to, and after resettlement in the US or Canada[a]

	Unexposed to pre-resettlement violence[b]	Exposed to pre-resettlement violence
Unexposed to violence after resettlement	41 (15%)	80 (29%)
Exposed to violence after resettlement	41 (15%)	113 (41%)

Exposure to violence after resettlement based on self-reported exposure in either the WTSS at Wave 1 or the MEV scale at Wave 2

[a]Includes only respondents with no missing data at Waves 1 and 2 ($n=275$)

[b]Exposure to violence prior to resettlement based on self-report on WTSS at Wave 1

witnessing someone being killed or severely injured (25%), seeing the body of someone who had been killed (25%), and being hit, beaten up, or severely hurt by someone other than a family member (21%). For post-resettlement violence exposure which occurred prior to Wave 1, also captured by the WTSS, being beaten or badly hurt by someone other than a family member (17%), being robbed by someone with a weapon (15%), witnessing someone being killed or severely injured (15%), and seeing the body of someone who was killed (15%) were the most common forms of violence exposure. At Wave 2, the most common past-year violence exposures, as captured by the MEV, were hearing gunfire near their homes (41%), witnessing someone being hit, slapped, punched or beaten up (41%), witnessing someone else being attacked with a weapon (16%), and witnessing a shooting (14%).

Violence exposure pre- and post-resettlement

Table 3 presents a descriptive bivariate analysis of the proportion of survey respondents who reported violence exposure either prior to or after resettlement. We collapsed violence experienced after resettlement at Wave 1 or Wave 2 to capture any violence after resettlement. Only 14% of our sample had no self-reported violence using the events captured in our scales at any time point, while the majority of respondents reported experiencing post-resettlement violence (56%), and the plurality of respondents reported violence exposures both prior to and after resettlement (41%).

The association of violence exposure with mental health symptoms

Table 4 presents the results of linear regression analyses of past violence exposures' association with depression, anxiety, and PTSD at Wave 1. Both pre- and post-resettlement violence exposures were consistently associated with of mental illness. The associations of pre- and post-resettlement violence with mental health were relatively comparable

Table 4 Effect of past experiences of violence on mental health outcomes at Wave 1[a]

	Depression (HSCL)[c] β (95% CI)	Anxiety (HSCL) β (95% CI)	PTSD (HTQ) β (95% CI)
Violence prior to resettlement[b]	0.39 (0.21 0.57)***	0.33 (0.12 0.55)**	0.55 (0.37 0.72)***
Violence exposure after resettlement, Wave 1	0.36 (0.10 0.62)***	0.38 (0.01 0.75)*	0.47 (0.21 0.74)***
Gender (female = 1)	0.38 (0.13 0.63)**	0.41 (0.13 0.70)**	0.32 (0.04 0.59)*
Number of years in the US or Canada	0.02 (0.01 0.05)***	0.01 (− 0.02 0.03)	0.01 (− 0.1 0.04)
City of residence (Boston as reference group)			
Lewiston	0.21 (0.16 0.26)***	− 0.04 (− 0.16 0.08)	0.23 (0.14 0.32)***
Minneapolis	0.28 (0.15 0.40)***	0.04 (− 0.06 0.13)	0.28 (0.16 0.40)***
Toronto	− 0.35 (− 0.49 − 0.22)***	− 0.21 (− 0.43 0.01)	− 0.12 (− 0.24 0.00)
Portland	0.16 (0.06 0.25)***	0.12 (− 0.01 0.25)	0.15 (0.11 0.20)***

HSCL Hopkins symptom checklist, *HTQ* Harvard trauma questionnaire

[a]Each column represents distinct linear regression models, controlling for number of years in resettlement, gender, and city of residence, while also clustering standard errors by city

[b]Violence exposure prior to resettlement and after resettlement measured at Wave 1 by War Trauma Screening Scale

[c]Mental health outcomes are standardized to mean of 0 and standard deviation of 1 *$p<0.05$; **$p<0.01$; ***$p<0.001$

across depression [β = 0.39, 95% CI (0.21 0.57) vs. β = 0.36, 95% CI (0.10 0.62)], anxiety [β = 0.33, 95% CI (0.12 0.55) vs. β = 0.38, 95% CI (0.01 0.75)], and PTSD [β = 0.55, 95% CI (0.37 0.72) vs. β = 0.47, 95% CI (0.21 0.74)]. Taken together, the strength of the association of multiple experiences of violence on mental illness is stark, as those who were exposed to violence both prior to and after resettlement had between 0.71 and 0.92 standard deviations' higher level of symptoms across outcomes.

Table 5 presents the results of linear regression analyses of past violence exposures' association with depression, anxiety, and PTSD at Wave 2. Violence exposure at all time-points was associated with symptoms of depression, but only post-resettlement violence was predictive of anxiety. In contrast, only past-year violence was associated with symptoms of PTSD at Wave 2 [β = 0.60, 95% CI (0.40, 0.80)]. Those who experienced violence at all 3 time-points were over 0.8 standard deviations higher in their symptoms of depression, anxiety, and PTSD.

Limitations

There are three important design characteristics to consider when interpreting our findings. First, our sample is not statistically representative, so caution should be taken with any extrapolation of the prevalence of our exposures or outcomes. However, the use of multiple sites and multiple waves of data collection are strengths which support the transportability of our findings to other settings in the US or Canada. Second, our measures of violence at Waves 1 and 2 were not identical, so we could not make a direct comparison of violence exposure between these waves (e.g., whether the number of exposures to violence was greater at Wave 1 or 2). To mitigate this limitation, we constrained our analyses and interpretations to assessing the presence and magnitude of association of any violence exposure at each wave. Third, as a result of not being able to make direct, longitudinal comparisons of pre and post-resettlement violence measures collected at Waves 1 and 2, we cannot disentangle whether our observed associations with mental health outcomes are due to the recency or the type of violence experienced, which are important areas for future research to explore.

Discussion

This study of Somali refugees' violence exposure at multiple time-points during resettlement and its association with mental health revealed three important findings. First, the prevalence of violence exposure in our sample, both prior to and after resettlement, was high; the prevalence of violence exposure in our sample at Waves 1 and 2 being comparable to the prevalence prior to resettlement. Stated differently, this suggests that violence exposure may be an enduring feature of resettlement for refugees in the United States and Canada. Second, violence exposure is strongly associated with symptoms for each mental health outcome: depression, anxiety, and PTSD. Third, within each dimension of mental health, violence exposures at different time-points had distinct associations with our outcomes. Prior exposure to violence has an enduring association with depressive symptoms, in addition to its association with recent violence

Table 5 Effect of past experiences of violence on mental health outcomes at Wave 2[a]

	Depression (HSCL)[c] β (95% CI)	Anxiety (HSCL) β (95% CI)	PTSD (HTQ) β (95% CI)
Violence prior to resettlement[b]	0.23 (0.06 0.40)**	0.17 (− 0.03 0.37)	0.20 (− 0.15 0.54)
Violence exposure after resettlement, Wave 1	0.24 (0.01 0.50)*	0.27 (0.05 0.49)*	0.01 (− 0.33 0.34)
Past year violence exposure, Wave 2	0.39 (0.17 0.62)***	0.46 (0.24 0.67)***	0.67 (0.46 0.88)***
Gender (female = 1)	0.39 (0.19 0.59)***	0.28 (0.11 0.45)***	0.17 (− 0.13 0.47)
Number of years in the US or Canada	0.00 (− 0.02 0.01)	0.00 (− 0.02 0.02)	0.01 (− 0.01 0.03)
City of residence (Boston as reference group)			
Lewiston	0.05 (− 0.07 0.17)	0.23 (0.02 0.44)*	0.31 (0.14 0.48)***
Minneapolis	0.32 (0.21 0.43)***	0.24 (0.07 0.40)**	0.16 (0.03 0.28)*
Toronto	0.18 (0.05 0.31)**	0.10 (− 0.05 0.26)	0.16 (− 0.04 0.36)
Portland	0.24 (0.15 0.33)***	0.49 (0.32 0.67)***	0.21 (0.10 0.31)***

HSCL Hopkins symptom checklist, *HTQ* Harvard trauma questionnaire

[a]Each column represents distinct linear regression models, controlling for number of years in resettlement, gender, and city of residence, while also clustering standard errors by city

[b]Violence exposure prior to resettlement and after resettlement measured at Wave 1 by War Trauma Screening Scale; past year violence at wave 2 measured by My Exposure to Violence Scale

[c]Mental health outcomes are standardized to mean of 0 and standard deviation of 1 *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

exposure. Anxiety was associated with post-resettlement violence only by Wave 2, while PTSD had a reliable association with past-year exposure to violence only by Wave 2.

This is the first study to examine multiple waves of exposure to violence after resettlement in a sample of refugees. The finding that all mental health outcomes measured are affected by recent exposure, though anxiety and PTSD are affected only by post-resettlement violence at Wave 2, suggests that violence may explain the persistence of mental health symptoms for refugees long after resettlement. To the authors' knowledge, the only other study to examine the relationship of pre- and post-resettlement violence exposure on mental health did so in a cross-sectional study and found that over one-third of their sample of Cambodian refugees had experienced at least one type of severe violence exposure after resettlement [3]. Other studies examining violence exposures among resettled refugees found that they are frequently resettled in neighborhoods with high levels of community violence [9, 12, 46]. While post-resettlement violence is under-studied, the limited available literature suggests that there is an urgent need to understand its distribution, develop strategies to prevent exposure, and create interventions to mitigate its potential influence on refugee mental health.

In comparison to the robust literature tying pre-resettlement violence to symptoms of traumatic stress among refugees, much less is known about the relationship of violence to other mental health outcomes, such as depression and anxiety. While we find that pre-resettlement violence places refugees at risk for PTSD symptoms after resettlement at Wave 1, we find that only past-year exposure has a strong association with PTSD at Wave 2. Other longitudinal studies have found that PTSD rates remain high even several years after resettlement, though the mechanism for this remains unclear [47]. We find that prior violence exposure is more likely to have an enduring association with anxiety and depression; when combined with the strong association of recent exposure with symptoms of mental illness, this points to the importance of examining cumulative exposures to violence for these outcomes. Our study suggests that recent violence exposure may play a critical role in enduring mental health symptoms across multiple outcomes for resettled refugees, potentially complicating approaches to intervention.

Somalis arrive in the United States as refugees with a history of violence and displacement. They face new struggles in the United States including poverty and community violence [48]. Research on Somali refugees in the US notes that they are often resettled areas with high rates of community violence and poverty when compared with other refugee and immigrant groups [48]. According to the American Community Survey, approximately half of Somalis in the US live in poverty [49]. Recent research in the US and Canada notes that Somali refugees are highly aware of the impact of violence on their communities, and that violence and poverty are often understood as the mutual results of structural discrimination [25]. In particular, gang prevention work may be critical to attend to; Somalis perceive gang violence as a major threat to their communities, and this study supports the idea that violence exposure undermines health development among refugees [25].

Indeed, our findings have several implications for clinical and programmatic intervention. While assessment of exposure to pre-resettlement trauma, including violence, is a regular part of the asylum process and standard clinical care for refugees, less is known about how more recent exposure to violence is attended to during screening processes. Screening for violence after resettlement would highlight particularly vulnerable individuals or communities. Screening should occur in a variety of settings, such as placement for housing and employment, as violence exposure may complicate interventions designed to address a wide range of post-resettlement stressors, such as navigating medical care, obtaining asylum status, stable housing, paid work, or language classes [50, 51]. Relatedly, programmatic interventions targeting harm reduction around violence should be evaluated based on outcomes beyond traumatic stress, including depression, anxiety, and resilience. Specific to PTSD, which rests on an assumption of current safety, screening for current exposure to violence in clinical settings is essential to assessment and treatment. All modes of intervention—clinical, programmatic, policy—need to monitor refugees' experiences with violence after resettlement and mitigate its effects where it cannot be prevented, given their vulnerability and risk of exposure.

This study contributes to the literature by having an explicit focus on and measurement of violence. Our findings highlight that post-resettlement violence for refugees, while an under-researched area, may represent a place of urgent need as a substantial risk to their mental health. Future work should directly measure violence and use longitudinal data collection to understand how the type, frequency, and chronicity of violence exposure impact mental health symptoms for refugees after resettlement.

Acknowledgements We thank Naima Agalab of the Refugee and Immigrant Assistance Center, who has been a partner in our work with the Somali community from the beginning and has provided leadership and training in their efforts to build community leadership teams in other cities. We thank Somali community advisors Farah Aw-Osman, Fatuma Hussein, Sharif Mohammed, and Rilwan Osman for their guidance and invaluable contribution to this project. We also thank Osob Issa for her efforts on recruitment and obtaining consent. And finally, we thank the community youth who took time to share their stories.

Funding This research was supported by the National Institute on Minority Health and Health Disparities (R21 MD012405). The findings and conclusions expressed in this report are solely those of the authors

and do not necessarily represent the official views of, the National Institute on Minority Health and Health Disparities.

Data availability Data from this manuscript are part of an ongoing, longitudinal study and are not publicly available.

Compliance with ethical standards

Conflicts of interest The authors of this manuscript have no relevant conflicts of interest or competing interests to disclose.

References

1. Geltman PL, Grant-Knight W, Mehta SD et al (2005) The "lost boys of Sudan": Functional and behavioral health of unaccompanied refugee minors resettled in the United States. Arch Pediatr Adolesc Med 159(6):585–591
2. Lindencrona F, Ekblad S, Hauff E (2008) Mental health of recently resettled refugees from the Middle East in Sweden: the impact of pre-resettlement trauma, resettlement stress and capacity to handle stress. Soc Psychiatry Psychiatr Epidemiol 43(2):121–131
3. Marshall GN, Schell TL, Elliott MN, Berthold SM, Chun C-A (2005) Mental health of cambodian refugees 2 decades after resettlement in the united states. JAMA 294(5):571–579
4. Tinghög P, Malm A, Arwidson C, Sigvardsdotter E, Lundin A, Saboonchi F (2017) Prevalence of mental ill health, traumas and postmigration stress among refugees from Syria resettled in Sweden after 2011: a population-based survey. BMJ Open 7(12):e018899
5. Betancourt TS, Newnham EA, Birman D, Lee R, Ellis BH, Layne CM (2017) Comparing trauma exposure, mental health needs, and service utilization across clinical samples of refugee, immigrant, and US-origin children. J Trauma Stress 30(3):209–218
6. Montgomery E (2010) Trauma and resilience in young refugees: a 9-year follow-up study. Dev Psychopathol 22(2):477–489
7. Schweitzer R, Melville F, Steel Z, Lacherez P (2006) Trauma, post-migration living difficulties, and social support as predictors of psychological adjustment in resettled Sudanese refugees. Aust N Z J Psychiatry 40(2):179–187
8. Hauff E, Vaglum P (1995) Organised violence and the stress of exile: Predictors of mental health in a community cohort of Vietnamese refugees three years after resettlement. Br J Psychiatry 166(3):360–367
9. Betancourt TS, Abdi S, Ito BS, Lilienthal GM, Agalab N, Ellis H (2015) We left one war and came to another: resource loss, acculturative stress, and caregiver–child relationships in Somali refugee families. Cultur Divers Ethnic Minor Psychol 21(1):114
10. Fazel M, Reed RV, 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
11. Scoglio AA, Salhi C (2020) Violence exposure and mental health among resettled refugees: a systematic review. Trauma Violence Abuse. https://doi.org/10.1177/1524838020915584
12. Berthold SM (2000) War traumas and community violence: Psychological, behavioral, and academic outcomes among Khmer refugee adolescents. J Multicult Soc Work 8(1–2):15–46
13. Shalev AY, Freedman S, Peri T et al (1998) Prospective study of posttraumatic stress disorder and depression following trauma. Am J Psychiatry 155(5):630–637
14. Breslau N, Chilcoat HD, Kessler RC, Davis GC (1999) Previous exposure to trauma and PTSD effects of subsequent trauma: results from the Detroit Area Survey of Trauma. Am J Psychiatry 156(6):902–907
15. Greene T, Neria Y, Gross R (2016) Prevalence, detection and correlates of PTSD in the primary care setting: a systematic review. J Clin Psychol Med Settings 23(2):160–180
16. Fazel M, Wheeler J, Danesh J (2005) Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. Lancet 365(9467):1309–1314
17. Busso DS, McLaughlin KA, Sheridan MA (2017) Dimensions of adversity, physiological reactivity, and externalizing psychopathology in adolescence: deprivation and threat. Psychosom Med 79(2):162
18. Alexander PC (1993) The differential effects of abuse characteristics and attachment in the prediction of long-term effects of sexual abuse. J Interpers Violence 8(3):346–362
19. Fassin D, Rechtman R (2009) The empire of trauma: an inquiry into the condition of victimhood. Princeton University Press, Princeton, New Jersey
20. Miller KE, 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. Soc Sci Med 70(1):7–16
21. Bracken PJ, Giller JE, Summerfield D (1995) Psychological responses to war and atrocity: the limitations of current concepts. Soc Sci Med 40(8):1073–1082
22. Connor P, Krogstad JM (2016) Facts about the global Somali diaspora. Pew Res Cent 5
23. Canada S (2016) Census profile, 2016 census. Statistics Canada Ottawa, ON
24. Gillespie S, Cardeli E, Sideridis G, Issa O, Ellis BH (2020) Residential mobility, mental health, and community violence exposure among Somali refugees and immigrants in North America. Health Place 65:102419
25. Ellis BH, Decker SH, Abdi SM, Miller AB, Barrett C, Lincoln AK (2020) A qualitative examination of how Somali young adults think about and understand violence in their communities. J Interpers Violence. https://doi.org/10.1177/0886260520918569
26. Forliti A (2011) As Minnesota's Somali gangs evolve, so does enforcement. Sun J. www.sunjournal.com/national/story/980881
27. Jul 31 MD· CN· P, July 31 2019 9:20 PM ET | Last Updated:, 2019. Gun violence a "crisis" in Toronto, Somali mothers group says | CBC News. CBC. Published August 1, 2019. Accessed October 31, 2020. https://www.cbc.ca/news/canada/toronto/toronto-police-services-board-somali-mothers-movement-1.5232590
28. Israel BA, Schulz AJ, Parker EA, Becker AB (1998) Review of community-based research: assessing partnership approaches to improve public health. Annu Rev Public Health 19(1):173–202
29. Spring M, Westermeyer J, Halcon L et al (2003) Sampling in difficult to access refugee and immigrant communities. J Nerv Ment Dis 191(12):813–819
30. Ellis BH, Kia-Keating M, Yusuf SA, Lincoln A, Nur A (2007) Ethical research in refugee communities and the use of community participatory methods. Transcult Psychiatry 44(3):459–481
31. Cardeli E, Sideridis G, Lincoln AK, Abdi SM, Ellis BH (2020) Social bonds in the diaspora: the application of social control theory to somali refugee young adults in resettlement. Psychol Violence 10(1):18
32. Ellis BH, Hulland EN, Miller AB, Bixby CB, Cardozo BL, Betancourt TS (2016) Mental health risks and resilience among Somali and Bhutanese refugee parents. Published online, Wash DC Migr Policy Inst
33. Layne CM, Stuvland R, Saltzman W, Djapo N, Pynoos RS (1999) War trauma screening scale. Unpubl Manuscr, Published online
34. Layne CM, Pynoos RS, Saltzman WR et al (2001) Trauma/grief-focused group psychotherapy: school-based postwar intervention with traumatized Bosnian adolescents. Group Dyn Theory Res Pract 5(4):277

35. Ellis BH, MacDonald HZ, Lincoln AK, Cabral HJ (2008) Mental health of Somali adolescent refugees: the role of trauma, stress, and perceived discrimination. J Consult Clin Psychol 76(2):184
36. Selner-O'Hagan MB, Kindlon DJ, Buka SL, Raudenbush SW, Earls FJ (1998) Assessing exposure to violence in urban youth. J Child Psychol Psychiatry 39(2):215–224
37. Brennan RT, Molnar BE, Earls F (2007) Refining the measurement of exposure to violence (ETV) in urban youth. J Community Psychol 35(5):603–618
38. Parloff MB, Kelman HC, Frank JD (1954) Comfort, effectiveness, and self-awareness as criteria of improvement in psychotherapy. Am J Psychiatry 111(5):343–352
39. Onyut LP, Neuner F, Ertl V, Schauer E, Odenwald M, Elbert T (2009) Trauma, poverty and mental health among Somali and Rwandese refugees living in an African refugee settlement–an epidemiological study. Confl Health 3(1):6
40. Jakobsen M, Meyer DeMott MA, Heir T (2017) Validity of screening for psychiatric disorders in unaccompanied minor asylum seekers: Use of computer-based assessment. Transcult Psychiatry 54(5–6):611–625
41. Kleijn WC, Hovens JE, Rodenburg JJ (2001) Posttraumatic stress symptoms in refugees: assessments with the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist–25 in different languages. Psychol Rep 88(2):527–532
42. Mollica RF, Caspi-Yavin Y, Bollini P, Truong T, Tor S, Lavelle J (1992) The Harvard Trauma Questionnaire: validating a cross-cultural instrument for measuring torture, trauma, and post-traumatic stress disorder in Indochinese refugees. Published online, J Nerv Ment Dis
43. Wind TR, van der Aa N, de la Rie S, Knipscheer J (2017) The assessment of psychopathology among traumatized refugees: measurement invariance of the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist-25 across five linguistic groups. Eur J Psychotraumatology 8(sup2):1321357
44. Myrtveit I, Stensrud E, Olsson UH (2001) Analyzing data sets with missing data: an empirical evaluation of imputation methods and likelihood-based methods. IEEE Trans Softw Eng 27(11):999–1013
45. StataCorp LP (2015) Stata statistical software (version release 14). Published online, Coll Stn TX Author
46. Carter TS, Osborne J (2009) Housing and neighbourhood challenges of refugee resettlement in declining inner city neighbourhoods: a Winnipeg case study. J Immigr Refug Stud 7(3):308–327
47. Sack WH, Clarke G, Him C et al (1993) A 6-year follow-up study of Cambodian refugee adolescents traumatized as children. J Am Acad Child Adolesc Psychiatry 32(2):431–437
48. Abdi CM (2012) The newest African-Americans?: somali struggles for belonging. Bild Int J Somali Stud 11(1):12
49. Abdi CM (2014) Threatened identities and gendered opportunities: Somali migration to America. Signs J Women Cult Soc 39(2):459–483
50. Murray KE, Davidson GR, Schweitzer RD (2010) Review of refugee mental health interventions following resettlement: best practices and recommendations. Am J Orthopsychiatry 80(4):576
51. Weine SM (2011) Developing preventive mental health interventions for refugee families in resettlement. Fam Process 50(3):410–430