



Trauma-Associated Psychiatric Disorders Among South Sudanese Dinka and Nuer Women Resettled in the USA

Nhial T. Tutlam^{1,2} · Louise H. Flick¹ · Hong Xian¹ · Hisako Matsuo³ · Anne Glowinski⁴ · Nyamal Tutdeal⁵

Published online: 21 May 2020

© Springer Nature Switzerland AG 2020

Abstract

It is well documented that war trauma inflicts serious damage on the mental health of populations affected. Despite having experienced near constant conflict for more than six decades, the paucity of studies assessing the prevalence of trauma-associated disorders among adult South Sudanese resettled in the USA, numbering over 30,000, is concerning. This study was designed to contribute to the literature on the mental health of this group of resettled refugees. The sample consisted of 76 Dinka and Nuer women in Nebraska and Tennessee. On average, participants experienced 9.8 traumatic events during the war, ranging from one to seventeen. Approximately 40%, 29%, and 26% of the women scored above threshold for diagnosis of current anxiety, depression, and PTSD, respectively. Factors including advanced age, i.e., >35 years old, (aOR = 4.76; 95% CI 1.29, 17.51), having elementary education or less (aOR = 6.21; 1.19, 32.27), and middle to secondary education (aOR = 5.65; 1.13, 28.19) were associated with scoring above threshold for diagnosis of current anxiety. By contrast, being divorced/widowed/separated and having annual household income over \$40,000 were associated with 88% and 86% reduction in odds of meeting diagnostic threshold for depression, respectively. This study identifies high level of traumatization among a group of Dinka and Nuer women during the Second Sudanese Civil War (1983–2005). Consequently, there are high rates of trauma-associated psychiatric disorders in this sample. More research is needed in this community to gain better understanding of risk and protective factors for trauma-associated psychiatric disorders.

Keywords PTSD · Depression · Anxiety · War trauma · Resettled refugees · South Sudanese

Introduction

Since the early 1990s, over 30,000 South Sudanese who fled war in their mother land and had settled in refugee camps in neighboring countries have been resettled in the USA (Shandy 2018). Many of the refugees who have settled in the USA left their country when they were very young and a few were born

in refugee camps in Ethiopia during the Second Sudanese Civil War, which ran from 1983 to 2005 (Collins 2008). This was a brutal conflict characterized by many atrocities inflicted on South Sudanese by the government of Sudan and ultimately claimed over 2.5 million lives through direct and indirect consequences of war such as famine, hunger, and diseases (Jok 2015). In addition to the atrocities committed by the northern military against the South Sudanese civilians, the South Sudanese also fought among themselves and committed atrocities against each other (Human Rights Watch/Africa 1994). Indeed, there were periods of intense violence where trauma-inducing acts including beheadings, rape, abduction of women and children, looting, and burning of food and live stocks were carried out by and between the Nuer and the Dinka and even among closely related Nuer clans between 1991 and 2002 (Hutchinson et al. 2002; Johnson 2003; Tutlam 2013). To this day, South Sudanese continue to be exposed to brutal intercommunal warfare (United Nations 2020).

A great majority of the South Sudanese who had fled Sudan when the conflict erupted in 1983 and settled in refugee camps in Ethiopia had to flee once again when the Ethiopian

✉ Nhial T. Tutlam
nhial.tutlam@slu.edu

¹ Department of Epidemiology and Biostatistics, College for Public Health and Social Justice, Saint Louis University, 3545 Lafayette Ave, St. Louis, MO 63103, USA

² Division of Health Promotion and Public Health Research, Saint Louis County Department of Public Health, St. Louis, MO, USA

³ Department of Sociology and Anthropology, Saint Louis University, St. Louis, MO, USA

⁴ Department of Psychiatry, School of Medicine, Washington University in Saint Louis, St. Louis, MO, USA

⁵ NyaEden Foundation, Inc., Philadelphia, PA, USA

government that had been supporting them was overthrown by forces allied with the government of Sudan (Beswick 2001). Some of them went back to South Sudan even while the war was still raging there and returned to refugee camps in Ethiopia following the internecine conflict in Nuer land between 1993 and 1996 (Tutlam 2013). Some of these refugees, including siblings of the first author, fled to Kenya through hostile territory in northern Kenya and settled at the Dadaab refugee camp in Northeastern Kenya. The Dadaab refugee camp is a difficult place with many challenges (Rawlence 2016) and many of them faced serious adversities before being resettled in the USA starting in 1993. It is evident that the refugees who have resettled in the USA, many in Midwestern states like Nebraska, have experienced a great deal of war trauma. A survey conducted for Nebraska's Health and Human Services' Office of Minority Health in 2006 found that among South Sudanese refugees resettled in Nebraska, about one-third reported having experienced beatings, stabbings, or shootings before their resettlement (Willis and Nkwocha 2006). Many of these refugees who have resettled in Nebraska and Tennessee hail from the Greater Upper Nile region of South Sudan.

It is well documented that war trauma inflicts serious damage on the mental health of populations affected (Levy and Sidel 2008; Murthy and Lakshminarayana 2006). Experts have referred to the psychological effects of war as hidden wounds (Tanielian et al. 2008). The most common psychiatric disorders that result from war trauma include anxiety, depression, and posttraumatic stress disorder (PTSD) (Kanter 2008; Murthy and Lakshminarayana 2006; Steel et al. 1999; Steel et al. 2002). Previous studies of war-affected populations have found high prevalence of these trauma-associated disorders ranging from 3 to 77% for PTSD, 12 to 85% for depression, and 25 to 81% for anxiety (Brune et al. 2002; de Jong et al. 2001; Fox and Willis 2009; Keller et al. 2006; Kienzler 2008; Marshall et al. 2005; Matanov et al. 2013; Mills et al. 2005; Mollica et al. 1999; Onyut et al. 2009; Tang and Fox 2001).

Although some studies have shown that symptoms of trauma-associated disorders are more prevalent among those in refugee camps (Jaranson et al. 2004), others have found similarly high prevalence rates among refugees resettled in western countries and these mental disorders can persist for years, even for a lifetime (Akinyemi et al. 2012; Bogic et al. 2015; Priebe et al. 2009). Therefore, understanding the long-term impact of war trauma in different communities affected by protracted civil war is crucial. Despite having been exposed to near constant conflict for nearly the last six decades (Atari and McKague 2015), the paucity of studies quantitatively assessing the prevalence of trauma-associated mental disorders among adult South Sudanese resettled in the USA is concerning. Therefore, this study was designed to contribute to the literature on the mental health of this group of resettled refugees. The objective of this study is to characterize the rates

of trauma-associated mental disorders and their associated risk factors among a group of South Sudanese Dinka and Nuer women resettled in Omaha, NE, and Nashville, TN.

Methods

Participants and Procedures

The participants were Dinka and Nuer women recruited primarily from four South Sudanese churches (two in Omaha, NE, and two in Nashville, TN) and other community events organized by the South Sudanese community. These are cities where a significant proportion of South Sudanese, particularly from the Nuer tribe, resettled in the USA resides (Shandy 2005). Church and community leaders were educated about the study beforehand and they made announcements in churches and encouraged their congregation members to participate. The Principal Investigator also spoke in churches or community centers that had agreed to allow participation of their members to explain the goals of the study and recruited participants by inviting those who were interested to contact him after the church service or event. Recruitment materials were also distributed in churches and posted on social media to reach a wide audience. In addition, the snowball technique was employed to recruit more study subjects by asking participants who had already enrolled in the study to contact other potential participants among their relatives and friends. The following inclusion criteria were used to determine participant's eligibility for enrollment in the study: they had to be South Sudanese women who immigrated to the USA as refugees between 1990 and 2010, must have had direct exposure to war trauma and had to be above the age of 19. Exclusion criteria were as follows: South Sudanese women who have not had any direct exposure to war trauma and women with current severe functional impairment or psychosis. Direct exposure to war trauma was defined as experiencing any war-related traumatic events either in South Sudan or in the refugee camps.

This was a cross-sectional study design where data were collected through face to face interviews. The interviews consisted of the investigator reading the questionnaires to the participants and recording their responses on interview forms. The interviews were conducted in the homes of the participant or private office spaces in churches or community centers from October 2015 to January 2016. Each participant was interviewed alone to ensure privacy. The total interview time lasted about 1 h and 45 min. Consistent with cultural practices of the community, where community members enjoy fellowship and spending time together, there were continued conversations after the interview was concluded. Indeed, in some cases, participants divulged crucial information to the interviewer long after the interviews were completed. Precautionary measures were taken to address any adverse

emotional reaction that might result from the interviews. A licensed clinical mental health professional was always on standby during the interviews to provide professional assistance in the event any participant developed emotional reaction as a result of remembering past trauma. A contingency plan was developed to take any participant to the emergency room or call emergency medical services (EMS) if a serious emotional reaction requiring urgent medical attention emerged. Each subject received a \$10 Wal-Mart gift card for their participation.

Exposure to trauma and trauma symptoms used to determine the presence or absence of PTSD were assessed using the English and Arabic versions of the revised Harvard Trauma Questionnaire (HTQ) (Mollica et al. 1992). As there is still no Nuer translation of the HTQ, the Principal Investigator, a native Nuer speaker, who conducted all the interviews, interpreted the questions for participants who did not speak English well. A small number (six) of the women who spoke fluent classical Arabic completed the Iraqi Arabic version of the HTQ. This version has been used in Arabic-speaking refugees (Vindbjerg et al. 2016). Although the HTQ was first developed and tested in Southeast Asian refugees, it has been adapted to many different cultures and has been shown to be effective in detecting mental illnesses in culturally diverse settings (Mollica et al. 1987). Mollica et al. (2004) showed that the validity of the HTQ was good with 78% sensitivity and 79% specificity for making a PTSD diagnosis in a clinical sample when compared with a diagnosis made by a clinician using the DSM-IV criteria. Moreover, the internal reliability for part I (trauma events) was found to be very high ($r = 0.91$) and even higher (0.98) for part IV (trauma symptoms). In test-retest analysis conducted over a period of 18 months, it was demonstrated that the instrument had high test-retest reliability for part I ($r = 0.89$) and for part I ($r = 0.92$) (Mollica et al. 2004).

The HTQ consists of five different parts. For the purpose of this study, part I was used to elicit information about traumatic events experienced. Specifically, it was used to determine the number of traumatic events experienced by each individual. This section consists of a checklist of 40 different traumatic events and the interviewee is asked whether he/she experienced any of the events listed and he/she is expected to respond yes or no to each of the questions. Part IV was used to gather information about 40 different trauma symptoms to determine the presence or absence of PTSD in the participants. The severity of the symptoms or how much these symptoms bothered the respondent in the last year was graded on a 4-point scale assigned the following values: 1 = not at all, 2 = a little bit, 3 = quite a bit, and 4 = extremely. Of note, the first 16 items of the symptoms list in part IV are based on the DSM-IV symptom and severity criteria for PTSD (Mollica et al. 2004).

To compute a score to determine whether an individual meets diagnostic criterion for PTSD based on this instrument,

the scores of responses of the first 16 questions are added then divided by 16. Similarly, for the total score, the scores of responses to the 40 questions are added and then divided by 40. A score of ≥ 2.5 is considered equivalent to a PTSD diagnosis. This cut-off value was developed for the Indochinese population and the developers of the instrument suggest this value may be high for other populations and may yield too many false negatives; therefore, they recommend using a cut-off value of ≥ 2.0 in the absence of cut-off value validated for the specific population under study (Mollica et al. 2004). Therefore, in the present study, the recommended cut-off value of ≥ 2.0 was used to reduce the chance of misclassification error resulting from potential false negatives.

Anxiety and depressive symptoms were assessed using the Hopkins Symptom Checklist–25 (HSCL–25) (Mollica et al. 1987). Briefly, the HSCL–25 is an instrument that was originally developed in English for research in non-refugee populations and has been validated in the US general population but it has been adopted for use in refugee populations and has been used in many refugee studies (Hollifield et al. 2002). The instrument contains 25 items divided into two parts. Part I consists of 10 items measuring anxiety symptoms and Part II consists of 15 items measuring symptoms of depression. The symptoms are measured on a 4-point severity scale. The severity scale is assigned numbers: 1 = not at all, 2 = a little bit, 3 = quite a bit, and 4 = extremely. A cut-off value of ≥ 1.75 has been scientifically identified as the optimal value for determining presence of psychiatric illness (Mollica et al. 2004). Although this value was determined for Indochinese populations (Mollica et al. 1987), it has been shown to be consistent with an anxiety or depression diagnosis in US and other populations (Derogatis et al. 1974; Hollifield et al. 2002; Winokur et al. 1984); therefore, this cut-off value was used for determining diagnostic threshold for participants in this study. The validity of the instrument was shown to be good in identifying a depression diagnosis with 88% sensitivity and 73% specificity when compared with DSM-III diagnosis made by a psychiatrist and the test-retest reliability over a period of 6 months was shown to be excellent at $r = 0.89$ for the total scale and $r = 0.82$ for each of the of the subscales (Mollica et al. 1987).

In addition to asking participants about current symptoms (within the past 12 months) of the trauma-associated disorders, they were also asked if they experienced any of these symptoms prior to 2013 or not to determine the rates of past disorders. The year 2013 was chosen as cut-off because it was the year the ongoing civil war in South Sudan erupted. The participants were also asked if they have ever experienced any of the symptoms at any point in their life to determine lifetime rates.

Data Analysis

All statistical analyses were conducted in SAS statistical package, version 9.4 (SAS Institute, Cary, NC). The goal of the

analysis was to determine rate of trauma-associated disorders among study participants and their associated risk factors. The Proc Survey function in SAS was used to generate percentages and 95% confidence intervals for the different sample characteristics, trauma-associated disorders, traumatic event categories, and number of disorders. The Proc Means function was used to characterize continuous variables. Bivariate and multivariable logistic regression analyses were used to determine risk factors for determining diagnosis of the three trauma-associated psychiatric disorders of interest (anxiety, depression, and PTSD). These were the dependent variables in the logistic regression models, dichotomized as yes/no at their diagnostic thresholds. Covariates included in the logistic regression models to determine risk factors were drawn from the literature. These covariates (independent variables) included the following: degree of trauma exposure, number of trauma events/categories, age at the time of trauma, SES, level of education, social support, marital status, length of time in the USA, and household income. Forced entry method was utilized to assess potential confounding and the 10% change in effect estimate rule was applied to determine what variables were confounders or not (Tong and Lu 2001). Any variables that did not change the crude effect estimates by 10% or more were excluded from the final model. Since exposure to trauma has been consistently associated with development of these disorders, it was included in all multivariable models, regardless of whether it met the 10% rule or not.

Ethical Approval

This study was approved by the Saint Louis University Institutional Review Board (protocol no. 25700). Written informed consent was obtained from all participants.

Results

The sociodemographic characteristics of the 76 women who participated in the study are presented in Table 1. Most of the women who participated in the study (43.4%) came to the USA through Kenya, followed by Ethiopia (36.8%) and Egypt (15.8%). A great majority of the participants (93%) came from the greater Upper Nile region, which includes Jonglei, Unity, and Upper Nile states. A few (7%) participants hailed from the greater Bahr el Ghazal region. Roughly equal numbers of women had elementary education or less or had obtained post-secondary education, with approximately 41% having middle to secondary education. A majority of the women (59.2%) were married, with 26.3% and 14.5% identifying themselves as divorced or separated and single or never married, respectively. A clear majority (70%) of the women had full-time employment, with 71% of them reporting more than \$20,000 annual household income. The women ranged in

Table 1 Sample characteristics (categorical variables), $N = 76$

| Characteristics | <i>N</i> | Percent | 95% CI |
|---|----------|---------|-----------|
| Traumatic events categories | | | |
| 1–5 events | 11 | 14.5 | 6.4–22.6 |
| 6–10 events | 29 | 38.2 | 27.0–49.3 |
| ≥ 11 events | 36 | 47.4 | 35.9–58.9 |
| Participant's level of education | | | |
| Elementary school education or less | 22 | 28.9 | 18.5–39.4 |
| Secondary school education | 31 | 40.8 | 29.5–52.1 |
| Post-secondary school education | 23 | 30.3 | 19.7–40.8 |
| Participant's employment status | | | |
| Employed part-time | 11 | 14.5 | 6.4–22.6 |
| Employed full-time | 53 | 69.7 | 59.2–80.3 |
| Unemployed | 12 | 15.8 | 7.4–24.2 |
| Participant's marital status | | | |
| Single/never married | 11 | 14.5 | 6.4–22.6 |
| Married/cohabiting | 45 | 59.2 | 47.9–70.5 |
| Divorced/separated/widowed | 20 | 26.3 | 16.2–36.4 |
| Region of origin in South Sudan | | | |
| Greater Bahr el Ghazal | 5 | 6.6 | 0.9–12.3 |
| Greater Upper Nile | 71 | 93.4 | 87.7–99.1 |
| Refugee camp from which participant immigrated to the USA | | | |
| Ethiopia | 28 | 36.8 | 25.7–47.9 |
| Egypt | 12 | 15.8 | 7.4–24.2 |
| Kenya | 33 | 43.4 | 32.0–54.8 |
| Other | 3 | 3.9 | 0.0–8.4 |
| Annual household income | | | |
| ≤ \$20,000 | 22 | 28.9 | 15.5–39.4 |
| \$20,001–\$40,000 | 26 | 34.2 | 23.3–45.1 |
| > \$40,000 | 28 | 36.8 | 25.7–47.9 |
| Governmental support | | | |
| Yes | 57 | 75.0 | 65.0–85.0 |
| No | 19 | 25.0 | 15.0–35.0 |

age from 23 to 45 years old with an average age of 35 years. On average, participants had five children each and at the time of the study, many had lived in the USA for an average of 16 years (Table 2). Importantly, on average, the women in the study experienced what they consider to be their worst trauma at the age of 13, when they were still in South Sudan or in the refugee camps.

Table 3 presents rates of the different trauma-associated psychiatric disorders. Almost 40% of the women scored above the threshold for diagnosis of current anxiety disorder (within the past 12 months). Approximately 26% were found to have past anxiety disorder (any symptoms prior to 2013) and 41% met criteria for lifetime anxiety disorder. Similarly, 29% of the women scored above the diagnostic threshold for current depressive disorder, with 21% and 32% meeting

Table 2 Sample characteristics (continuous variables), $N = 76$

| Continuous variables | <i>N</i> | Mean | Standard deviation | Range |
|-----------------------------------|----------|------|--------------------|-----------|
| Participant's age | 76 | 35.4 | 5.3 | 23.0–45.0 |
| Age they experienced worst trauma | 76 | 12.9 | 7.6 | 2.0–42.0 |
| Number of children | 76 | 4.7 | 2.1 | 1.0–10.0 |
| Number of years in the USA | 76 | 15.6 | 4.5 | 5.0–22.0 |
| Mean number of traumatic events | 76 | 9.7 | 3.5 | 1.0–17.0 |

criteria for past and lifetime depressive disorder, respectively. Twenty-six percent of the women who participated in the study met diagnostic threshold for current PTSD, with 16% and 29% meeting criteria for past and lifetime PTSD diagnosis, respectively. One in five participants scored above diagnostic threshold for two or more trauma-associated disorders. For the different trauma-associated disorders, we assessed lifetime presence of the conditions. Nearly 41% scored above the threshold used for diagnosis of lifetime anxiety, with 32% and 29% scoring above diagnostic threshold for depression and PTSD, respectively. Using the year 2013 as cut-off based on the time the ongoing intercommunal conflict in South Sudan started, approximately 26%, 20%, and 16% scored above diagnostic threshold for anxiety, depression, and PTSD symptoms manifesting prior to 2013. Notably, nearly half of the participants (47.4%) scored above the threshold for current diagnosis of any of the three trauma-associated disorders assessed in this study, with approximately 29% meeting diagnostic criteria for two or more trauma-associated disorders.

Table 4 presents results of adjusted analyses assessing risk factors. A few factors were associated with scoring above threshold required for diagnosis of trauma-associated disorders. Specifically, advanced age (adjusted odds ratio = 4.76; 95% CI 1.29, 17.51), having elementary education or less (aOR = 6.21; 1.19, 32.27), and having middle to secondary education level (aOR = 5.65; 1.13, 28.19) were found to be risk factors for diagnosis of current anxiety disorder. On the other hand, divorced/widowed or separated women, and those with annual household income over \$40,000 were 88% and 86% less likely to meet diagnostic criteria for depressive disorder.

Discussion

This study suggests that a subgroup of South Sudanese women from the Dinka and Nuer ethnic groups resettled in the USA have experienced high level of traumatization from the protracted conflict they were exposed to during the two-decade long Second Sudanese Civil War (1983–2005). Specifically, these data show that this group of women experienced an average of 9.7 traumatic events, ranging from one

to seventeen. Finding this high level of trauma in this group was not entirely surprising. A previous survey conducted for the Nebraska Health and Human Services' Office of Minority Health in 2006 found that among South Sudanese refugees resettled in Nebraska, the same population from which majority of this study sample was drawn, about one-third reported having experienced beatings, stabbings, or shootings before their resettlement (Willis and Nkwocha 2006). Similarly, another study by Fox and Willis (2009) from the same population found that a small sample of South Sudanese Dinka and Nuer participants experienced an average of 8.6 traumatic events before immigrating to the USA.

The average number of traumatic events in this sample is, however, slightly lower than the average of 15 traumatic events reported in a study by Ayazi et al. (2014), which was conducted in the Bahr el Ghazal region in the northern part of South Sudan. At the time of the study, parts of this region were still contested by both the Republic of Sudan and the Republic of South Sudan, and frequent skirmishes occurred between the two armies even after the signing of the Comprehensive Peace Agreement (CPA) in 2005 (Jok 2015).

As a result of this high level of exposure to trauma, it is not surprising that the women in this study had high rates of trauma-associated psychiatric disorders. Specifically, nearly 40%, 29%, and 26% of the women scored above the threshold set for diagnosis of current anxiety, depression, and PTSD, respectively. Because this study was conducted in the middle of a raging conflict that started in December 2013, the study attempted to assess what the level of trauma-associated disorders was prior to the onset of the conflict. This was important in order to place the findings of this study in proper context of prevailing conditions. In terms of diagnosis, based on any symptoms occurring before the outbreak of the conflict, 26% met diagnostic threshold for anxiety disorder; 21% had depressive disorder; and 16% scored above threshold for diagnosis of PTSD.

Of note, compared with the findings of the only two studies of adult South Sudanese resettled in developed countries (USA and Australia), this sample had significantly higher rates of these trauma-associated disorders. In particular, when compared with the study by Fox and Willis (2009), which found a rate of just 3% for PTSD, 12% for depression, and 9% for anxiety, this study found significantly higher rates of

Table 3 Rates of traumatic events and trauma-associated psychiatric disorders among Dinka and Nuer women resettled in the USA, $N = 76$

| Characteristics | <i>N</i> | % | 95% CI |
|---|----------|------|-----------|
| Diagnosis of current anxiety disorder | | | |
| Yes | 30 | 39.5 | 28.2–50.7 |
| No | 46 | 60.5 | 49.3–71.8 |
| Diagnosis of past (prior to 2013) anxiety disorder | | | |
| Yes | 20 | 26.3 | 16.2–36.4 |
| No | 56 | 73.7 | 63.6–83.8 |
| Diagnosis of lifetime anxiety disorder | | | |
| Yes | 31 | 40.8 | 29.5–52.1 |
| No | 45 | 59.2 | 47.9–70.5 |
| Diagnosis of current depressive disorder | | | |
| Yes | 22 | 28.9 | 18.5–39.4 |
| No | 54 | 71.1 | 60.6–81.5 |
| Diagnosis of past (prior to 2013) depressive disorder | | | |
| Yes | 16 | 21.1 | 11.7–30.4 |
| No | 60 | 78.9 | 69.6–80.3 |
| Diagnosis of lifetime depressive disorder | | | |
| Yes | 24 | 31.6 | 20.9–42.3 |
| No | 52 | 68.4 | 57.7–79.1 |
| Diagnosis of current PTSD (DSM-IV score) | | | |
| Yes | 20 | 26.3 | 16.2–36.4 |
| No | 56 | 73.7 | 63.6–83.8 |
| Diagnosis of past (prior to 2013) PTSD (DSM-IV score) | | | |
| Yes | 12 | 15.8 | 7.4–24.2 |
| No | 64 | 84.2 | 75.8–92.6 |
| Diagnosis of lifetime PTSD (DSM-IV score) | | | |
| Yes | 22 | 28.9 | 18.5–39.4 |
| No | 54 | 71.1 | 60.6–81.5 |
| Diagnosis of current multiple disorders | | | |
| 0 disorders | 40 | 52.6 | 41.1–64.1 |
| 1 disorder | 14 | 18.4 | 9.5–27.3 |
| ≥ 2 disorders | 22 | 28.9 | 18.5–39.4 |
| Diagnosis of past (prior to 2013) multiple disorders | | | |
| 0 disorders | 50 | 65.8 | 54.9–76.7 |
| 1 disorder | 11 | 14.5 | 6.4–22.6 |
| ≥ 2 disorders | 15 | 19.7 | 10.6–28.9 |
| Diagnosis of lifetime multiple disorders | | | |

Table 3 (continued)

| Characteristics | <i>N</i> | % | 95% CI |
|---|----------|------|-----------|
| 0 disorders | 39 | 51.3 | 39.8–62.8 |
| 1 disorder | 13 | 17.1 | 8.4–25.8 |
| ≥ 2 disorders | 24 | 31.6 | 20.9–42.3 |
| Diagnosis of current any disorders | | | |
| Yes | 36 | 47.4 | 35.9–58.9 |
| No | 40 | 52.6 | 41.1–64.1 |
| Diagnosis of past (prior to 2013) any disorders | | | |
| Yes | 26 | 34.2 | 23.3–45.1 |
| No | 50 | 65.8 | 54.9–76.7 |
| Diagnosis of lifetime any disorders | | | |
| Yes | 37 | 48.7 | 37.2–60.2 |
| No | 39 | 51.3 | 39.8–62.8 |

these trauma-associated disorders in the same population. Given that the study by Fox and Willis (2009) was conducted when the participants were recently resettled, one would have expected the rates to be higher at the time, since the experience of trauma would presumably still be fresh in the memory of the participants. Recency of trauma has been found to be an important risk factor for diagnosis of these trauma-associated disorders in previous South Sudanese studies (Ayazi et al. 2014; Roberts et al. 2009). At the time of the study, most of the participants had lived in the USA for only 4 years. The most important reason for this difference may be that while that study utilized a cut-off value of ≥ 2.5 for PTSD diagnosis, the present study used a cut-off value of ≥ 2.0 as recommended by the instrument developers. One other possible explanation for the stark difference may be the fact that the previous study included males while this study was exclusively based on responses from women. Studies have shown that impact of war trauma, particularly manifested as PTSD, tends to be greater among women (Johnson and Thompson 2008). For example, in a study of South Sudanese conducted in Juba (Roberts et al. 2009), women exhibited higher level of PTSD compared with men (43% vs. 30%) and even higher level of depression (59% vs. 41%). The other study of South Sudanese, conducted in Australia, by Schweitzer et al. (2006) also found rates of just 12% for PTSD and 16% for depression, significantly lower than in the present study.

The high rates of trauma-associated psychiatric disorders in this study are not surprising. Not only are more individuals affected many also bear a heavy burden, with one in five participants scoring above diagnostic threshold for two or more disorders. The findings of this study are in the range of other South Sudanese studies, which have found varying prevalence rates

Table 4 Risk factors for diagnosis of current psychiatric disorders among Dinka and Nuer women resettled in the USA, *N* = 76

| Risk factors | Current PTSD (DMV-IV score) | | Current anxiety disorder | | Current depressive disorder | | Diagnosis of any current disorders | |
|-----------------------------------|-----------------------------|------------|--------------------------|-------------------|-----------------------------|------------------|------------------------------------|------------|
| | aOR | 95% CI | aOR | 95% CI | aOR | 95% CI | aOR | 95% CI |
| Age at the time of worst trauma | 1.00 | 0.91–1.09 | 0.96 | 0.89–1.04 | 1.01 | 0.94–1.08 | 1.00 | 0.94–1.07 |
| Length of time in the USA (years) | 0.94 | 0.81–1.08 | 0.94 | 0.82–1.08 | 1.01 | 0.90–1.13 | 1.00 | 0.90–1.12 |
| Age categories | | | | | | | | |
| ≤ 35 years | Ref | | Ref | | Ref | | Ref | |
| > 35 years | 1.43 | 0.44–4.62 | <i>4.76</i> | <i>1.29–17.51</i> | 3.73 | 0.88–15.90 | 2.10 | 0.61–7.23 |
| Participant’s employment status | | | | | | | | |
| Unemployed | Ref | | Ref | | Ref | | Ref | |
| Employed | 0.62 | 0.12–3.23 | 0.97 | 0.18–5.21 | 0.83 | 0.16–4.40 | 0.76 | 0.16–3.63 |
| Participant’s marital status | | | | | | | | |
| Married/cohabiting | Ref | | Ref | | Ref | | Ref | |
| Divorced/widowed/separated | 1.42 | 0.30–6.77 | 0.55 | 0.13–2.38 | <i>0.12</i> | <i>0.02–0.66</i> | 0.41 | 0.09–1.82 |
| Never married | 9.09 | 0.89–92.55 | 1.57 | 0.20–12.51 | 0.72 | 0.08–6.16 | 0.99 | 0.14–7.02 |
| Participant’s level of education | | | | | | | | |
| Post-secondary education | Ref | | Ref | | Ref | | Ref | |
| Middle to secondary education | 3.16 | 0.47–21.40 | <i>5.65</i> | <i>1.13–28.19</i> | 3.57 | 0.59–21.64 | 4.20 | 0.88–19.94 |
| Elementary education or less | 4.50 | 0.67–30.25 | <i>6.21</i> | <i>1.19–32.27</i> | 2.53 | 0.42–15.39 | 2.76 | 0.57–13.39 |
| Traumatic events | | | | | | | | |
| 1–5 events | Ref | | Ref | | Ref | | Ref | |
| 6–10 events | 1.57 | 0.36–6.90 | 5.31 | 0.58–48.64 | 2.34 | 0.20–27.80 | 6.06 | 0.69–52.85 |
| ≥ 11 events | 1.01 | 0.61–6.47 | 2.55 | 0.30–21.56 | 2.93 | 0.28–31.19 | 6.17 | 0.76–50.23 |
| Annual household income | | | | | | | | |
| ≤ \$20,000 | Ref | | Ref | | Ref | | Ref | |
| \$20,001–\$40,000 | 1.57 | 0.36–6.90 | 0.84 | 0.19–3.76 | 0.59 | 0.11–3.12 | 1.16 | 0.28–4.87 |
| > \$40,000 | 1.01 | 0.61–6.47 | 0.41 | 0.07–2.31 | <i>0.14</i> | <i>0.02–0.94</i> | 0.36 | 0.07–1.88 |
| Governmental support | | | | | | | | |
| No | Ref | | Ref | | Ref | | Ref | |
| Yes | 0.92 | 0.22–3.92 | 0.99 | 0.27–3.64 | 2.51 | 0.52–12.06 | 1.46 | 0.42–5.09 |

aOR, adjusted odds ratios; CI, confidence intervals; Ref, reference group
 Italicized figures represent statistically significant results

ranging from 9 to 26% for anxiety, 12 to 50% for depression, and 3 to 48% for PTSD (Ayazi et al. 2014; Fox and Willis 2009; Karunakara et al. 2004; Ng et al. 2017; Peltzer 1999; Roberts et al. 2009; Schweitzer et al. 2006). Importantly, it has been suggested that armed conflict has negative effect on children (Kadir et al. 2019) and their effects can last up to adulthood (Werner 2012). The average age at which the participants experienced their worst trauma is 13 years; thus, it is not surprising that the rates of these trauma-associated disorders are still high in this sample. From a public health perspective, these findings are important because they highlight the need for tailored education to help the community understand the importance of seeking care and designing interventions to address persistent trauma-associated psychiatric disorders.

These findings are also consistent with results of other studies of refugee women resettled in the USA. For example, a study of

Syrian refugees resettled in the USA by Javanbakht et al. (2019) found rates of possible anxiety, depression, and PTSD among women to be 31.9%, 52.3%, and 58.8%, respectively. More important, especially in the context of this study population, studies have shown that effects of war trauma can persist for a long time (Bogic et al. 2015). For example, a study of Cambodian refugees found still very high rates of PTSD (62%) and depression (51%) 20 years after resettlement in the USA (Marshall et al. 2005). At the time of the study, the participants of this study had lived in the USA for an average of 16 years.

It is important to point out that although there was no statistically significant difference between current (within the past 12 months) and past (prior to 2013) rates of the trauma-associated disorders, as determined by the overlapping 95% confidence intervals, these data suggest current rates may be higher or possibly on an upward trend at the time of the interviews. A

possible explanation for the high level of trauma-associated psychiatric disorders in this study may be a result of retraumatization. Retraumatization refers to the “traumatic stress reactions, responses, and symptoms that occur subsequent to multiple exposures to traumatic events that are physical, psychological, or both in nature” (Duckworth and Follette 2012). It may also occur by recalling traumatic events experienced in the past and events such as those experienced by immigrants in their country of resettlement, referred to as post-migration factors (Schweitzer et al. 2006), may exacerbate it (Silove et al. 1993). South Sudanese have been exposed to perpetual conflict for decades. These conflicts continue to this day (United Nations 2020). Indeed, data for this study were collected during some of the worst episodes of the ongoing conflict that erupted in December 2013. Almost all of the participants of the study, regardless of which side of the warring parties they sympathized with (government or opposition), reported losing very close relatives in the conflict, including parents, siblings, or extended family members.

Other important factors that may contribute to high rates of mental disorders among immigrants are cultural bereavement and cultural identity; this is the idea that loss of one’s cultural context negatively impacts one’s mental well-being (Bhugra and Becker 2005). This is directly related to the post-resettlement challenges that refugees encounter in their country of resettlement and contribute to their suboptimal mental health, which can manifest as persistent anxiety, depression, and PTSD (Lindencrona et al. 2008; Schweitzer et al. 2006). This may be happening in this study sample as well. Studies of South Sudanese in Australia have found that post-migration factors such as difficulties with adjustment to new culture, language difficulties, lack of employment, and lack of social support or being far away from relatives may be contributing to their psychological distress (Schweitzer et al. 2006).

Indeed, looking at the risk factors that were found to be associated with scoring above the threshold required for diagnosis of current anxiety in this study, post-resettlement circumstances of the participants figured prominently. In particular, in this sample, women with elementary education or less were more than six times as likely and those with middle to secondary education were four-fold as likely to have anxiety disorder compared with those with post-secondary education. Level of education is directly related to what one does for a living and in many cases determines whether or not an individual may be gainfully employed, which in turn determines the level of family income and a host of other socioeconomic factors (Vilorio 2016). Moreover, many of the women in this study worked in physically taxing and dangerous jobs such as meat processing factories (Shandy 2005), where some of the community members have either witnessed or have themselves been involved in work-related accidents. This may contribute to the chronic psychological distress in the community. This finding is consistent with previous studies that have

found lower level of education to be associated with development of anxiety and other mood disorders in different populations, including immigrants (Cwikel et al. 2008; Kirmayer et al. 2011). Conversely, women in the highest annual household income bracket of the study sample (>\$40,000) were found to be 86% less likely to score above threshold for diagnosis of depression compared with those who reported annual household income of ≤\$20,000. This finding is also consistent with previous studies showing people with higher level of income have better health outcomes (Cwikel et al. 2008).

A surprising finding of this study was that divorced, widowed, or separated women were 88% less likely to meet diagnostic threshold for depressive disorder compared with married women or those cohabiting with a male partner. This is contrary to previous studies that have shown that marriage or having a stable partner is protective against meeting criteria for diagnosis of depression (Fenta et al. 2004; Poole et al. 2018). This finding may, however, be indicative of a paradigm shift among the South Sudanese resettled in the west. Specifically, as a result of newfound financial independence and freedom, some South Sudanese women reject marriage (Khawaja and Milner 2012) and it is possible that having a husband may not be an important protective factor as it might once have been. Indeed, some participants of this study expressed that having a man at home who does not help with house chores, expects the wife to come home from a long day of grueling work and cook for him, and expects her to hand-over her weekly paycheck to him so that he can spend it as he wishes while neglecting her needs, is more stressful and are possibly better off by themselves. Some of these issues have been identified as causes of marital problems in the South Sudanese community in Australia (Khawaja and Milner 2012). It is also possible that in the cases where there may be more serious underlying issues such as intimate partner violence, given the legal protections afforded to women in the USA, they view divorce through more hopeful lenses (Sabri et al. 2018) and this may provide much welcome relief from such stressful and traumatic experiences. In the context of cultural expectations where women are required to be submissive to their husbands and divorce is frowned upon (Khawaja and Milner 2012), this finding is particularly interesting and warrants further investigation in future studies.

Strengths and Limitations of the Study

This study is not without limitations. The sample consisted overwhelmingly of women from two ethnic groups from mostly one geographic region. Given the great diversity of South Sudanese and the way different communities respond to stressful situations such as trauma, and the fact that the nature and level of violence was not uniform across South Sudan, the results might have been different if a broad cross-section of South Sudanese women had participated in the study. Therefore, the results may not be

generalizable to the wider South Sudanese community. Another important limitation of the study concerns possible lack of understanding by some participants of certain concepts related to questions about symptoms. It is possible that if the participants did not understand a question and did not ask for clarification, they might have given the wrong response. In some cases, participants divulged relevant information to the interviewer long after the interviews were completed indicating they might have misunderstood some of the questions. Another potential limitation is that due to the sensitive nature of the questions, participants may have withheld pertinent information, even though it was clearly explained to them that only the researcher would have access to the data and the information would not be shared with others. It is possible this assurance was not heeded by some participants. Additionally, because this was a cross-sectional study, we cannot establish temporality, which is an inherent limitation in these types of studies. This is particularly important given the perpetual nature of conflict in the native country of the participants, which may potentially lead to retraumatization (Duckworth and Follette 2012).

The study's major strength is that it is the first study assessing the impact of war trauma among an important group of South Sudanese adult women resettled in the USA, specifically focusing on the rates of these trauma-associated disorders. Moreover, this study included a larger sample than each of the two previous studies among South Sudanese resettled in developed countries. This allowed for multivariable analysis adjusting for potential confounding variables than the previous studies.

Conclusions

This study identifies a high level of trauma exposure among a group of South Sudanese Dinka and Nuer women during the Second Sudanese Civil War (1983–2005). Consequently, there are high rates of trauma-associated psychiatric disorders in this sample but only a limited number of factors were associated with scoring above threshold required for diagnosis of these disorders. Additional research with larger sample size is needed to determine other important risk factors associated with diagnosis of these trauma-associated disorders.

Acknowledgments The authors would like to thank Mr. Duol Rut, MA, LMHP and Ms. Anne Dodd, MS, BCBA mental health practitioners for their help with the study. We also thank community and church leaders, including Rev. James Kuajien Kuek, Rev. Tutnyang Keat, Rev. James Kuany Dhol, Rev. Jock Tut Paleak, Rev. Paul Mator Manyok, and Lay Pastor Bol Lam Puk for allowing participation of their members. We also wish to thank Mr. Kor Tot Rualmim and Mr. Keak Lam Kier Kok for their assistance.

Funding Information This research was supported by dissertation research from the doctoral program at the College for Public Health and Social Justice, St. Louis University.

Compliance with Ethical Standards

This study was approved by the Saint Louis University Institutional Review Board (protocol no. 25700). Written informed consent was obtained from all participants.

Conflict of Interest Declaration The authors declare that they have no conflict of interest.

References

- Akinyemi, O. O., Owoaje, E. T., Ige, O. K., & Popoola, O. A. (2012). Comparative study of mental health and quality of life in long-term refugees and host populations in Oru-Ijebu, Southwest Nigeria. *BioMed Central Res Notes*, 5(1), 394. <https://doi.org/10.1186/1756-0500-5-394>.
- Atari, D. O., & McKague, K. (2015). South Sudan: Stakeholders' views of technical and vocational education and training and a framework for action. *J Vocat Educ Train*, 67(2), 169–186.
- Ayazi, T., Lien, L., Eide, A., Swartz, L., & Hauff, E. (2014). Association between exposure to traumatic events and anxiety disorders in a post-conflict setting: A cross-sectional community study in South Sudan. *BioMed Central Psychiatry*, 14(6). <https://doi.org/10.1186/1471-244x-14-6>.
- Beswick, S. (2001). "If You Leave Your Country You Have No Life!" Rape, suicide, and violence: the voices of Ethiopian, Somali, and Sudanese female refugees in Kenyan refugee camps. *Northeast African Studies*, 8(3), 69–98.
- Bhugra, D., & Becker, M. A. (2005). Migration, cultural bereavement and cultural identity. *World Psychiatry*, 4(1), 18–24.
- Bogic, M., Njoku, A., & Priebe, S. (2015). Long-term mental health of war-refugees: A systematic literature review. *BioMed Central Int Health Human Rights*, 15(1), 29. <https://doi.org/10.1186/s12914-015-0064-9>.
- Brune, M., Haasen, C., Krausz, M., Yagdiran, O., Bustos, E., & Eisenman, D. (2002). Belief systems as coping factors for traumatized refugees: a pilot study. *European Psychiatry*, 17(8), 451–458.
- Collins, R. O. (2008). *A history of modern Sudan*. Cambridge, UK: New York: Cambridge University Press.
- Cwikel, J., Zilber, N., Feinson, M., & Lerner, Y. (2008). Prevalence and risk factors of threshold and sub-threshold psychiatric disorders in primary care. *Social Psychiatry and Psychiatric Epidemiology*, 43(3), 184–191. <https://doi.org/10.1007/s00127-007-0286-9>.
- de Jong, J. T., Komproe, I. H., Van Ommeren, M., El Masri, M., Araya, M., Khaled, N., et al. (2001). Lifetime events and posttraumatic stress disorder in 4 postconflict settings. *Journal of the American Medical Association*, 286(5), 555–562.
- Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., & Covi, L. (1974). The Hopkins Symptom Checklist (HSCL): a self-report symptom inventory. *Behavioral Science*, 19(1), 1–15.
- Duckworth, M. P., & Follette, V. M. (2012). *Retraumatization: assessment, treatment, and prevention*. London, UK: New York: Routledge.
- Fenta, H., Hyman, I., & Noh, S. (2004). Determinants of depression among Ethiopian immigrants and refugees in Toronto. *Journal of Nervous and Mental Disease*, 192(5), 363–372. <https://doi.org/10.1097/01.nmd.0000126729.08179.07>.
- Fox, S., & Willis, M. (2009). Initiatory mental health assessments for Dinka and Nuer refugees from Sudan. *Journal of Immigrant and Refugee Studies*, 7(2), 159–179. <https://doi.org/10.1080/15562940902935621>.
- Hollifield, M., Warner, T. D., Lian, N., Krakow, B., Jenkins, J. H., Kesler, J., Stevenson, J., & Westermeyer, J. (2002). Measuring trauma and

- health status in refugees: a critical review. *Journal of the American Medical Association*, 288(5), 611–621.
- Human Rights Watch/Africa (1994). The lost boys: child soldiers and unaccompanied boys in southern Sudan. Retrieved from.
- Hutchinson, S. E., Jok, J. M., & Werbner, R. (2002). Gendered violence and the militarization of ethnicity. *Postcolonial Subjectivities in Africa*, 84.
- Jaranson, J. M., Butcher, J., Halcon, L., Johnson, D. R., Robertson, C., Savik, K., Spring, M., & Westermeyer, J. (2004). Somali and Oromo refugees: correlates of torture and trauma history. *American Journal of Public Health*, 94(4), 591–598.
- Javanbakht, A., Amirsadri, A., Abu Suhaiban, H., Al Saud, M. I., Alobaidi, Z., Rawi, Z., & Arfken, C. L. (2019). Prevalence of possible mental disorders in Syrian refugees resettling in the United States screened at primary care. *Journal of Immigrant and Minority Health*, 21(3), 664–667. <https://doi.org/10.1007/s10903-018-0797-3>.
- Johnson, D. (2003). *The root causes of Sudan's civil wars* (Vol. 5). Bloomington: Indiana University Press.
- Johnson, H., & Thompson, A. (2008). The development and maintenance of post-traumatic stress disorder (PTSD) in civilian adult survivors of war trauma and torture: a review. *Clinical Psychology Review*, 28(1), 36–47. <https://doi.org/10.1016/j.cpr.2007.01.017>.
- Jok, J. M. (2015). *Sudan: race, religion, and violence*. Oneworld Publications.
- Kadir, A., Shenoda, S., & Goldhagen, J. (2019). Effects of armed conflict on child health and development: a systematic review. *PLoS One*, 14(1), e0210071. <https://doi.org/10.1371/journal.pone.0210071>.
- Kanter, E. D. (2008). The impact of war on mental health. In B. S. Levy & V. W. Sidel (Eds.), *War and Public Health* (pp. 51–68). Oxford, UK; New York: Oxford University Press.
- Karunakara, U. K., Neuner, F., Schauer, M., Singh, K., Hill, K., Elbert, T., & Bumha, G. (2004). Traumatic events and symptoms of post-traumatic stress disorder amongst Sudanese nationals, refugees and Ugandans in the West Nile. *African Health Sciences*, 4(2), 83–93.
- Keller, A., Lhewa, D., Rosenfeld, B., Sachs, E., Aladjem, A., Cohen, L., Smith, H., & Porterfield, K. (2006). Traumatic experiences and psychological distress in an urban refugee population seeking treatment services. *Journal of Nervous and Mental Disease*, 194(3), 188–194.
- Khawaja, N. G., & Milner, K. (2012). Acculturation stress in South Sudanese refugees: Impact on marital relationships. *International Journal of Intercultural Relations*, 36(5), 624–636.
- Kienzler, H. (2008). Debating war-trauma and post-traumatic stress disorder (PTSD) in an interdisciplinary arena. *Social Science & Medicine*, 67(2), 218–227. <https://doi.org/10.1016/j.socscimed.2008.03.030>.
- Kirmayer, L. J., Narasiah, L., Munoz, M., Rashid, M., Ryder, A. G., Guzder, J., et al. (2011). Common mental health problems in immigrants and refugees: general approach in primary care. *Canadian Medical Association Journal*, 183(12), E959–E967. <https://doi.org/10.1503/cmaj.090292>.
- Levy, B. S., & Sidel, V. W. (Eds.). (2008). *War and public health*. Oxford, UK; New York: Oxford University Press.
- 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. *Social Psychiatry and Psychiatric Epidemiology*, 43(2), 121–131.
- Marshall, G. N., Schell, T. L., Elliott, M. N., Berthold, S. M., & Chun, C. A. (2005). Mental health of Cambodian refugees 2 decades after resettlement in the United States. *Journal of the American Medical Association*, 294(5), 571–579. <https://doi.org/10.1001/jama.294.5.571>.
- Matanov, A., Giacco, D., Bogic, M., Ajdukovic, D., Franciskovic, T., Galeazzi, G. M., Kucukalic, A., Lecic-Tosevski, D., Morina, N., Popovski, M., Schützwohl, M., & Priebe, S. (2013). Subjective quality of life in war-affected populations. *BioMed Central Public Health*, 13(1), 624. <https://doi.org/10.1186/1471-2458-13-624>.
- Mills, E. J., Singh, S., Holtz, T. H., Chase, R. M., Dolma, S., Santa-Barbara, J., & Orbinski, J. J. (2005). Prevalence of mental disorders and torture among Tibetan refugees: a systematic review. *BioMed Central Int Health Human Rights*, 5(1), 7. <https://doi.org/10.1186/1472-698X-5-7>.
- Mollica, R. F., Wyshak, G., de Marneffe, D., Khuon, F., & Lavelle, J. (1987). Indochinese versions of the Hopkins Symptom Checklist-25: a screening instrument for the psychiatric care of refugees. *American Journal of Psychiatry*, 144(4), 497–500.
- Mollica, R. F., 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. *Journal of Nervous and Mental Disease*, 180(2), 111–116.
- Mollica, R. F., McInnes, K., Sarajlic, N., Lavelle, J., Sarajlic, I., & Massagli, M. P. (1999). Disability associated with psychiatric comorbidity and health status in Bosnian refugees living in Croatia. *Journal of the American Medical Association*, 282(5), 433–439.
- Mollica, R. F., McDonald, L., Massagli, M., & Silove, D. M. (2004). *Measuring trauma, measuring torture: instructions and guidance on the utilization of the Harvard Program in Refugee Trauma's versions of the Hopkins Symptom Checklist-25 (HSCL-25) & the Harvard Trauma Questionnaire (HTQ)*. Cambridge: Harvard University.
- Murthy, R. S., & Lakshminarayana, R. (2006). Mental health consequences of war: a brief review of research findings. *World Psychiatry*, 5(1), 25–30.
- Ng, L. C., Lopez, B., Pritchard, M., & Deng, D. (2017). Posttraumatic stress disorder, trauma, and reconciliation in South Sudan. *Social Psychiatry and Psychiatric Epidemiology*, 52(6), 705–714. <https://doi.org/10.1007/s00127-017-1376-y>.
- Onyut, L. P., 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. *Conflict and Health*, 3(1), 6. <https://doi.org/10.1186/1752-1505-3-6>.
- Peltzer, K. (1999). Trauma and mental health problems of Sudanese refugees in Uganda. *Central African Journal of Medicine*, 45(5), 110–114.
- Poole, D. N., Hedt-Gauthier, B., Liao, S., Raymond, N. A., & Barnighausen, T. (2018). Major depressive disorder prevalence and risk factors among Syrian asylum seekers in Greece. *BioMed Central Public Health*, 18(1), 908. <https://doi.org/10.1186/s12889-018-5822-x>.
- Priebe, S., Matanov, A., Janković Gavrilović, J., McCrone, P., Ljubotina, D., Knežević, G., Kučukalić, A., Francisković, T., & Schützwohl, M. (2009). Consequences of untreated posttraumatic stress disorder following war in former Yugoslavia: morbidity, subjective quality of life, and care costs. *Croatian Medical Journal*, 50(5), 465–475. <https://doi.org/10.3325/cmj.2009.50.465>.
- Rawlence, B. (2016). *City of thorns: nine lives in the world's largest refugee camp*: Picador.
- Roberts, B., Damundu, E. Y., Lomoro, O., & Sondorp, E. (2009). Post-conflict mental health needs: a cross-sectional survey of trauma, depression and associated factors in Juba, Southern Sudan. *BioMed Central Psychiatry*, 9(1), 7. <https://doi.org/10.1186/1471-244X-9-7>.
- Sabri, B., Nnawulezi, N., Njie-Carr, V. P., Messing, J., Ward-Lasher, A., Alvarez, C., & Campbell, J. C. (2018). Multilevel risk and protective factors for intimate partner violence among African, Asian, and Latina immigrant and refugee women: perceptions of effective safety planning interventions. *Race and Social Problems*, 10(4), 348–365.

- 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. *Australian and New Zealand Journal of Psychiatry*, *40*(2), 179–187. <https://doi.org/10.1080/j.1440-1614.2006.01766.x>.
- Shandy, D. J. (2005). Nuer in the United States. In M. Ember, C. R. Ember, & I. Skoggard (Eds.), *Encyclopedia of diasporas: immigrant and refugee cultures around the world* (pp. 1046–1054). Boston: Springer US.
- Shandy, D. J. (2018). Global transactions: Sudanese refugees sending money home. *Urban Life: Readings in the Anthropology of the City*, 338.
- Silove, D., McIntosh, P., & Becker, R. (1993). Risk of retraumatisation of asylum-seekers in Australia. *Australian and New Zealand Journal of Psychiatry*, *27*(4), 606–612.
- Steel, Z., Silove, D., Bird, K., McGorry, P., & Mohan, P. (1999). Pathways from war trauma to posttraumatic stress symptoms among Tamil asylum seekers, refugees, and immigrants. *Journal of Traumatic Stress*, *12*(3), 421–435.
- Steel, Z., Silove, D., Phan, T., & Bauman, A. (2002). Long-term effect of psychological trauma on the mental health of Vietnamese refugees resettled in Australia: a population-based study. *The Lancet*, *360*(9339), 1056–1062. [https://doi.org/10.1016/s0140-6736\(02\)11142-1](https://doi.org/10.1016/s0140-6736(02)11142-1).
- Tang, S. S., & Fox, S. H. (2001). Traumatic experiences and the mental health of Senegalese refugees. *Journal of Nervous and Mental Disease*, *189*(8), 507–512.
- Tanielian, T., Haycox, L. H., Schell, T. L., Marshall, G. N., Burnam, M. A., Eibner, C., . . . Vaiana, M. E. (2008). Invisible wounds of war. *Summary and recommendations for addressing psychological and cognitive injuries*. Retrieved from.
- Tong, I. S., & Lu, Y. (2001). Identification of confounders in the assessment of the relationship between lead exposure and child development. *Annals of Epidemiology*, *11*(1), 38–45. [https://doi.org/10.1016/s1047-2797\(00\)00176-9](https://doi.org/10.1016/s1047-2797(00)00176-9).
- Tutlam, N. T. (2013). *Liberating South Sudan one patient at a time: the life of Dr. Timothy T. Tutlam*. Bloomington: Xlibris Corporation.
- United Nations. (2020). ‘Senseless cycle of violence’ in South Sudan must end – UN humanitarian chief. Retrieved from <https://www.un.org/africarenewal/news/senseless-cycle-violence-south-sudan-must-end-%E2%80%93-un-humanitarian-chief>
- Vilorio, D. (2016). Education matters. *Career Outlook*. Retrieved from https://www.bls.gov/careeroutlook/2016/data-on-display/education-matters.htm?view_full
- Vindbjerg, E., Carlsson, J., Mortensen, E. L., Elklit, A., & Makransky, G. (2016). The latent structure of post-traumatic stress disorder among Arabic-speaking refugees receiving psychiatric treatment in Denmark. *BioMed Central Psychiatry*, *16*(1), 309. <https://doi.org/10.1186/s12888-016-0936-0>.
- Werner, E. E. (2012). Children and war: risk, resilience, and recovery. *Development and Psychopathology*, *24*(2), 553–558.
- Willis, M. S., & Nkwocha, O. (2006). Health and related factors for Sudanese refugees in Nebraska. *Journal of Immigrant and Minority Health*, *8*(1), 19–33.
- Winokur, A., Winokur, D. F., Rickels, K., & Cox, D. S. (1984). Symptoms of emotional distress in a family planning service: stability over a four-week period. *The British Journal of Psychiatry*, *144*(4), 395–399.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.