

Psychotic-like experiences in a conflict-affected population: a cross-sectional study in South Sudan

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Abstract

Purpose This study investigates the prevalence of psychotic-like experiences (PLEs) and examines exposure to potentially traumatic events and other relevant risk factors for PLEs in the general population of a conflict-affected, low-income country.

Methods We conducted a cross-sectional community based study of four Greater Bahr el Ghazal States, South Sudan ($n = 1200$). The Harvard Trauma Questionnaire was applied to investigate exposure to potentially traumatic events. The Mini-International Neuropsychiatric Interview was used to detect PLEs.

Results The estimated prevalence of lifetime PLEs was 23.3 % and the rate of PLEs which were evaluated as bizarre was 9.5 %. Exposure to higher number of potentially traumatic events, younger age, rural residency, being unemployed, not having a regular income and having traditional religion were significantly associated with having PLEs. PLEs were significantly associated with reporting of psychological distress when controlling for other covariates.

Conclusions The finding of association between traumatic exposure and PLEs calls for greater attention to the diversity of negative mental health outcomes in conflict-affected populations.

Keywords Psychotic-like experiences · Potentially traumatic events · Conflict-affected · South Sudan

Background

Psychotic-like experiences (PLEs) are frequent in the general population and include delusions and hallucinations which may or may not be bizarre. The continuum view of psychosis suggests that psychotic symptoms are expressed along a continuum with clinical and non-clinical cases at each end of the spectrum [1]. In other words, PLEs do not necessarily meet the full criteria for psychotic disorders [2]. Nonetheless, individuals with PLEs represent a high-risk group for psychotic illness [3]. Individuals with

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intense and frequent PLEs were found to be five times more likely to receive a diagnosis of psychotic disorder 4 years later [4]. Individuals with PLEs also reported increased level of depression [5], being more at risk of developing comorbid disorders [6], and having poor functioning [5]. The available evidence suggests that bizarre PLEs, compared to non-bizarre PLEs, may have more substantial mental health consequences in form of higher level distress and reduced general functioning [7]. The bulk of evidence in this regard comes from high-income countries, and there is a dearth of information about this in populations in low- and middle-income countries.

A close link between post traumatic stress disorder (PTSD) and PLEs has been frequently reported [8, 9]. Several explanations have been forwarded for the high prevalence of PLEs in individuals with PTSD. One is that PTSD and PLEs can be viewed merely as PTSD with comorbid psychosis [10]. Another explanation suggests that PLEs may be more appropriately understood as dissociative symptoms [11] and thirdly that PTSD with psychotic features might be a subtype of PTSD or as a separate diagnostic entity where psychotic symptoms are developed after the onset of PTSD [12, 13].

A large body of literature has identified traumatic experiences, particularly childhood trauma, as a significant risk factor for development of psychosis and schizophrenia in adulthood [14–17] and for the presence of PLEs [3, 18]. The association of other types of potentially traumatic events (apart from childhood trauma) with PLEs has also been documented [19, 20]. However, these studies have largely focused on trauma exposure amongst war veterans [21–23]. Research on the PLEs in conflict-affected general populations and the impact of conflict-related potentially traumatic events on these symptoms is scarce. In a rare study, Sossay et al. investigated PLEs in war-affected Timor Leste. The results of this study showed that PLEs were associated with higher level of trauma exposure and high PTSD prevalence [24].

The current study draws on data from a community survey of the population in the Greater Bahr el Ghazal States in South Sudan, which is one of the most economically disadvantaged countries in the world [25]. Besides having an impoverished economy, the country has experienced more than 20 years of armed conflict. The few studies conducted among the South Sudanese population show high levels of trauma exposure and psychological distress [26–28].

The aims of this study were to examine:

- The prevalence of PLEs in the general population in a war-affected setting.
- The risk factors for PLEs and the impact of trauma exposure on the rate of PLEs.
- The association between PLEs and psychological distress.
- In addition, this study aimed to determine if similar patterns of risk factors can be identified for PLEs and bizarre PLEs.

Method

We conducted a cross-sectional community survey ($n = 1200$) in the Greater Bahr el Ghazal States, South Sudan in 2011. A multistage random cluster sampling method was used. Nine randomly selected administrative units ('Boma') constituted the survey clusters. The population data were based on the 2008 Sudan census [29]. These data were considered the most accurate population data available. In the next stage, the 'spin-the-pen' method from the WHO Expanded Programme on Immunization [30] was used for household selection: the approximate geographic centre of the area was identified and one household along an imaginary line connecting the centre to the periphery was selected at random. Subsequent households were then selected by visiting every third-closest household. Within each selected household, individuals who were 18 years or older and gave informed consent to take part in the study were assigned a number. A card was drawn at random from a deck of cards with corresponding numbers, and the household member with that number was then interviewed.

The interviewers were health personnel ($n = 11$, five women and six men) from the region who were familiar with the cultural traditions and fluent in the relevant local languages. They participated in two rounds of training workshops (9 days), during which they were trained using the survey instruments, and the cultural acceptability of the interview protocol was discussed. The research instruments were available in both English and Arabic, but the main language used was Arabic. In addition, the key terms of the questionnaire were discussed and translated into the indigenous languages of the area to ensure that the interviewers could easily explain all the items to the participants. Each household was approached by both a male and a female interviewer to ensure the interviewer's gender would match that of the participant. A total of 1236 households were contacted, from which 1200 participants were recruited. The response rate was 95 %. Ethical clearance was obtained from the Research Department in the Ministry of Health of the Government of South Sudan and the Norwegian Regional Committee for Medical Research.

Instruments

A questionnaire designed to gather information about socio-demographic factors, including sex, age, marital status, level of education, employment situation, religion and rural/urban setting, was administered to all participants.

The Mini-International Neuropsychiatric Interview (MINI) [31] (Arabic version) was used to detect PLEs. The MINI is a structured diagnostic psychiatric interview instrument and has been translated and used in many languages, and applied in various cultures and settings [32]. The MINI assesses the presence of psychotic symptoms (YES/NO answers) and the interviewer is required to evaluate the bizarreness of these experiences. PLEs was defined as the presence of at least one psychotic symptom (life time). The bizarreness of the PLEs was evaluated by local health workers. This gave us the opportunity to differentiate between the participants' self-reported PLEs and the bizarreness of these evaluated by interviewers who were familiar with the culture.

Psychological distress was measured by the General Health Questionnaire (GHQ-28). The GHQ-28 is a screening instrument that is widely used to detect psychological distress in community settings and non-psychiatric clinical settings [33]. It has been used in various populations and cultural settings [34], including Sudan [35]. Each item has a four-point severity scale ('not at all', 'no more than usual', 'rather more than usual' and 'much more than usual') with corresponding values of 0, 1, 2 or 3. Scores on the GHQ-28 were calculated by applying a binary scoring method: The two least symptomatic answers were scored 0 and the two most symptomatic answers scored 1 (0-0-1-1). For instance, if a participant answered that he or she has been getting edgy and bad-tempered 'not at all' or 'no more than usual' the item was scored 0, whereas if the response was 'rather more than usual' or 'much more than usual' the item was scored 1. A cut-off of 5 or higher was used to indicate psychological distress [33].

The Harvard Trauma Questionnaire (HTQ) was used to assess participants' exposure to potentially traumatic events. The HTQ is a frequently used instrument for assessing history of exposure to potentially traumatic events. The HTQ has been adapted for and used in various cultures and languages [36]. The Arabic version of the HTQ was employed in this study, after minor adaptations for the specific potentially traumatic events in the South Sudan setting. The Arabic version of HTQ includes 40 questions on exposure to potentially traumatic events with "Yes" or "No" answer choices. Participants were asked to confirm or disconfirm having been exposed to each of these 40 potentially traumatic events (lifetime).

Internal reliability was evaluated using Cronbach's alpha. It was estimated to be 0.94 for GHQ-28

(psychological distress) and 0.88 for MINI- psychotic symptoms and 0.87 for MINI-psychotic symptoms (bizarre). The obtained Cronbach's alpha values were above the commonly accepted level of 0.70 [37].

Data analyses

All analyses were conducted using SPSS (PASW) version 20.0. Missing data were excluded from the analysis. For any given variable, the maximum amount of missing data was less than 5 %.

A multivariate logistic regression analysis, using a two-step model with two blocks of independent variables, was conducted to determine which factors were the best predictors for presence of PLEs. The independent variables were sex, age, urban/rural setting, religion, marital status, level of education, employment status, having a regular monthly income, level of income and exposure to potentially traumatic events. The presence of PLEs was the dependent variable (dichotomous). In the first step, socio-demographic variables were entered into the model. Exposure to potentially traumatic events (categorised in 0; 1–5; ≥ 5 traumatic events) was entered in the second step which allowed the examination of the significance of trauma exposure in predicting the presence of at least one PLE, while controlling for socio-demographic variables. In a similar analysis, level of PLEs (bizarre) constituted the dependent variable. We examined the association between traumatic exposure with the presence of PLEs (evaluated as bizarre), while controlling for socio-demographic factors. A comparison between these two sets of regression analyses enabled us to examine the patterns of predictors (similarities/differences in combination of predictors) for PLEs and bizarre PLEs.

A separate set of regression analyses were performed to determine whether those who reported higher number of PLEs and bizarre PLEs (as continuous variables) differed from those reporting no symptoms of psychological distress after adjusting for demographic and trauma history variables.

Results

Table 1 shows the prevalence rates and socio-demographic and health related characteristics of the participants. The rate of lifetime PLEs was 23.3 % ($n = 276$), and the rate of PLEs evaluated as bizarre was 9.5 % ($n = 107$).

Women reported a lower rate of PLEs compared to men. A higher percentage of participants from rural areas had PLEs. However, no significant differences were found

Table 1 Socio-demographic and health related characteristics across Psychotic-like experiences

	Total <i>n</i> (%)	Psychotic-like <i>n</i> (%)	Psychotic-like (bizarre) <i>n</i> (%)
	1200 (100)	384 (33.0)	140 (11.8)
Sex			
Male	660 (56.4)	179 (27.6)	71 (11.6)
Female	510 (43.6)	94 (18.5)*	33 (6.8)*
Age (years)			
18–25	308 (26.0)	73 (24.1)	42 (14.7)
26–35	391 (33.1)	102 (26.4)	37 (10.3)
36–50	395 (33.4)	82 (21.0)	27 (7.2)
>50	89 (7.5)	19 (21.6)	1 (1.2)*
Urban/rural setting			
Urban	910 (77.8)	179 (19.4)	84 (9.0)
Rural	266 (22.2)	97 (36.7)*	23 (9.7)
Marital status			
Single	320 (27.2)	98 (31.1)	37 (12.8)
Married	774 (65.9)	160 (20.9)	63 (8.6)
No longer married	81 (6.9)	10 (12.3)*	5 (6.3)
Employment status			
Working	842 (76.8)	186 (22.4)	67 (8.4)
Student	144 (13.1)	43 (30.1)	18 (13.6)
Unemployed	111 (10.1)	25 (22.5)	14 (13.5)
Education			
No formal education	434 (36.8)	91 (21.0)	33 (8.6)
Primary	359 (30.4)	63 (17.7)	30 (8.9)
Secondary or higher	387 (32.8)	111 (29.2)*	40 (11.4)
Regular income			
Yes	346 (29.6)	103 (20.1)	48 (7.2)
No	823 (70.4)	164 (30.2)*	56 (15.2)*
Household monthly income USD			
<200	553 (63.1)	117 (21.4)	52 (9.9)
200–500	209 (23.9)	60 (29.1)	27 (13.9)
500–1000	85 (9.7)	33 (39.8)	12 (15.8)
>1000	29 (3.3)	5 (17.2)*	2 (8.3)
Religion			
Christian	1032 (89.3)	218 (21.4)	85 (8.8)
Muslim	40 (3.5)	10 (25.6)	5 (13.9)
Traditional belief	84 (7.3)	31 (36.9)*	10 (12.7)
Potentially traumatic events			
No event	1032 (89.3)	218 (21.4)	85 (8.8)
1–5 events	40 (3.5)	10 (25.6)	5 (13.9)
≥5 events	84 (7.3)	31 (36.9)*	10 (12.7)
Psychological distress			
No (GHQ <5)	719 (59.1)	78 (16.4)	29 (6.2)
Yes (GHQ ≥5)	481 (40.1)	198 (27.9)*	78 (11.9)*

* χ^2 significant difference, $p < 0.05$

between rural and urban participants regarding bizarreness of these PLEs. A higher rate of participants with PLEs (or bizarre PLEs) reported psychological distress (GHQ ≥5) compared to persons who did not report PLEs (or bizarre

PLEs). Similarly, participants with PLEs (and bizarre PLEs) reported significantly higher number of potentially traumatic experiences, compared to individual with no PLEs.

Table 2 Potentially traumatic events reported by the participants

Type of event	During the war <i>n</i> (%)	After the peace agreement <i>n</i> (%)
Lack of food or clean water	796 (72.4)	97 (8.1)
Lacked shelter	784 (67.3)	64 (5.3)
Property looted, confiscated, or destroyed	693 (58.9)	128 (10.8)
Witnessed someone being physically harmed (beating, knifing, etc.)	6445 (53.8)	130 (10.8)
Suffered ill health without access to medical care or medicine	698 (60.0)	97 (8.1)
Murder or violent death of family member	975 (81.7)	54 (4.5)
Searched	610 (50.8)	121 (10.1)
Exposed to combat situation (explosions, artillery fire, shelling) or landmine	921 (76.8)	58 (4.8)
Forced to leave your country/hometown	488 (40.7)	108 (9.0)
Family member kidnapped or taken as a hostage	992 (82.7)	46 (3.8)
Physically harmed (beaten, knifed, etc.)	878 (73.2)	76 (6.3)

Table 3 Results of two separate regression analyses examining the association between predictor variables and presence of psychotic-like experiences/bizarre

Predictor	Psychotic-like symptoms		Psychotic-like symptoms Bizarre	
	Model 1 OR (CI 95 %)	Model 2 OR (CI 95 %)	Model 1 OR (CI 95 %)	Model 2 OR (CI 95 %)
Age	0.97 (0.96–0.97)*	0.73 (0.95–0.99)*	0.95 (0.92–0.98)*	0.94 (0.92–0.98)*
Rural residency	3.87 (2.43–3.19)*	4.01 (2.48–6.47)*	0.94 (0.51–1.77)	0.96 (0.51–1.79)
Sex				
Male	1.45 (0.99–2.11)	1.13 (0.91–1.97)	1.84 (1.08–3.14)*	1.68 (0.98–2.88)
Marital status				
Married (reference: single)	1.34 (0.59–3.08)	1.38 (0.60–3.17)	1.33 (0.43–4.06)	1.39 (0.45–4.31)
No longer married (reference: single)	2.01 (0.81–5.00)	2.06 (0.82–5.20)	0.94 (0.27–3.24)	1.00 (0.29–3.52)
Employment				
Student (reference: working)	1.70 (0.92–3.12)	1.69 (0.90–3.16)	1.23 (0.52–2.95)	1.17 (0.48–2.82)
Unemployed (reference: working)	2.21 (1.15–4.23)*	2.11 (1.09–4.09)*	7.14 (3.43–14.87)*	7.08 (3.36–14.93)*
Level of education				
Primary (reference: no formal education)	0.70 (0.43–1.14)	0.67 (0.41–1.11)	0.72 (0.37–1.38)	0.69 (0.35–1.35)
Secondary or higher (reference: no formal education)	0.85 (0.49–1.47)	0.79 (0.45–1.39)	0.64 (0.31–1.33)	0.58 (0.27–1.23)
Level of income 2	1.19 (0.75–1.89)	1.26 (0.79–2.01)	1.53 (0.83–2.84)	1.61 (0.86–2.98)
Level of income 3	1.54 (0.81–2.96)	1.70 (0.88–3.29)	1.51 (0.65–3.55)	1.66 (0.70–3.93)
Level of income 4	0.94 (0.37–2.47)	1.03 (0.40–2.65)	1.14 (0.30–4.40)	1.26 (0.32–4.87)
Regular income	1.99 (1.33–3.01)*	2.18 (1.43–3.31)*	2.28 (1.30–3.99)*	2.48 (1.40–4.39)*
Muslim (ref. Christian)	0.96 (0.43–2.11)	0.99 (0.44–2.25)	1.46 (0.55–3.86)	1.64 (0.61–4.39)
Traditional belief (ref. Christian)	2.73 (0.96–7.79)	3.07 (1.08–8.74)*	4.64 (1.61–13.39)*	5.82 (1.94–17.43)*
Potentially traumatic event exposure (1–5 events)		1.23 (0.46–3.32)		4.01 (0.75–21.38)
Potentially traumatic event exposure (≥ 5 events)		3.58 (1.59–8.03)*		7.18 (1.69–33.14)*

* $p < 0.05$

The most frequently reported potentially traumatic events were similar amongst participants with and without PLEs and included “lack of food or water”, “lack of shelter” and “suffering from ill health without access to medical care or medicine”. Participants with bizarre PLEs additionally reported “witnessing someone being

physically harmed/tortured”, and “being forced to leave the hometown” as the most frequent potentially traumatic events (Table 2).

The results of the hierarchical regression analyses assessing the predictors of PLEs (and PLEs, bizarre) are shown in Table 3. Younger age, rural residency, being

Table 4 Results of multivariate regression analysis examining the association between predictor variables and psychological distress

	Model 1	Model 2	Model 3
Predictor	OR (CI 95 %)	OR (CI 95 %)	OR (CI 95 %)
Age	1.01 (0.99–1.03)	1.01 (0.99–1.02)	1.01 (0.99–1.03)
Rural residency	2.59 (1.62–4.13)*	2.72 (1.69–4.38)*	4.13 (2.43–7.02)*
Sex			
Male	1.42 (0.99–2.02)	1.57 (1.09–2.26)*	1.72 (1.19–2.50)*
Marital status			
Married (reference: single)	2.12 (1.13–3.99)*	1.33 (0.66–2.64)	1.28 (0.63–2.58)
No longer married (reference: single)	3.87 (1.72–8.72)	1.40 (0.63–3.11)	1.26 (0.56–2.85)
Employment			
Student (reference: working)	2.12 (1.13–3.99)*	2.22 (1.16–4.28)*	2.05 (1.06–3.98)*
Unemployed (reference: working)	3.87 (1.72–8.71)*	3.75 (1.66–8.48)*	3.75 (1.60–8.78)*
Level of education			
Primary (reference: no formal education)	0.88 (0.57–1.37)	0.86 (0.55–1.35)	0.94 (0.59–1.48)
Secondary or higher (reference: no formal education)	0.80 (0.49–1.42)	0.80 (0.46–1.37)	0.84 (0.48–1.46)
Household monthly income US\$			
200–500 (Reference <200)	0.75 (0.49–1.17)	0.79 (0.51–1.24)	0.73 (0.46–1.16)
500–1000 (Reference <200)	0.69 (0.37–1.31)	0.77 (0.40–1.48)	0.66 (0.34–1.29)
>1000 (Reference <200)	0.38 (0.16–0.92)*	0.41 (0.17–1.01)	0.37 (0.14–0.95)
Regular income	1.01(0.68–1.49)	1.12 (0.75–1.67)	0.95 (0.63–1.44)
Muslim (reference: Christian)	0.52 (0.24–1.11)	0.51 (0.23–1.12)	0.47 (0.21–1.07)
Traditional belief (reference: Christian)	1.53 (0.54–4.35)	1.78 (0.59–5.36)	1.54 (0.48–4.92)
Potentially traumatic event exposure (1–5 events) (reference: no events)		1.06 (0.47–2.35)	1.04 (0.45–2.40)
Potentially traumatic event exposure (≥ 5 events) (reference: no events)		3.18 (1.63–6.21)*	2.65 (1.31–5.38)*
Psychotic-like experience			1.91 (1.91–4.87)*
Psychotic-like experience-Bizarre			1.22 (0.64–2.32)

Controlled for covariates

* $p < 0.05$

unemployed, not having a regular income and having traditional religion (compared to Christianity and Islam) increased the likelihood of reporting PLEs. In addition, exposure to higher number of potentially traumatic events was also significantly associated with having PLEs.

Younger age, being unemployed, not having a regular income, having traditional religion (compared to Christianity and Islam), and higher number of potentially traumatic experiences were significantly associated with having bizarre PLEs.

Table 4 shows the results of a regression analysis assessing the associations between PLEs and psychological distress, controlling for socio-demographic factors and other covariates. PLEs increased the likelihood of reporting psychological distress. Being male, being from rural areas, being unemployed or student and higher number of potentially traumatic exposure also increased the risk of psychological distress. It is interesting to note that bizarre PLEs were not significantly associated with reporting of psychological distress when controlling for other covariates.

Discussion

The most salient finding of the present study is the significant association between exposure to potentially traumatic events and PLEs/bizarre PLEs. A higher rate of trauma experience has been identified as a risk factor for various mental disorders such as PTSD, depression and anxiety, in war-affected population [38, 39]. Our study, shows that exposure to potentially traumatic events is a risk factor for having PLEs/bizarre PLEs. This finding is consistent with Soosay et al. study from post-conflict Timor Leste [24]. The impact of potentially traumatic events was, however, significant for higher number of experienced events only. Cumulative exposure to potentially traumatic events is believed to be associated with negative mental health outcome such as PTSD and depression [40] and psychosis [41].

The high rates of PLEs and bizarre PLEs found in the current study are similar to findings from other population studies, and as such, in accordance with the continuum model of psychosis [1].

Result from war-affected Timor Leste [24] reported a rate of 12.3 % PLEs. Results of a study amongst Kenyan youth showed that 23 % of participants reported psychotic-like experiences [42]. A South African study reported a prevalence of 12.7 % for auditory or visual hallucinations in general population [43] while a lower rate of psychotic-like experiences (2.1 %) was found in a community survey in Nigeria [44]. Likewise, the rate of psychotic-like experiences in general population diverges between 5 and 28 % according to epidemiological surveys from USA, Britain and Australia [45–47]. Compared to more sensitive and specific screening instruments [e.g.: the Prodromal Questionnaire (PQ), the Community Assessment of Psychic Experience (CAPE) or the Peters Delusion Inventory (PDI)], MINI may have a higher threshold to detect PLEs. Hence, applying MINI may have resulted in an underestimation of the prevalence of PLEs. Taking into consideration the variation in the study populations and the application of a different methodology and instruments, direct comparison between the rates of PLEs in our study and those of previous studies is not straightforward.

Similar to our findings, lack of food, water and shelter and ill health without access to medical care or medicine were among the traumatic experiences reported most commonly in post-conflict Afghanistan [48]. It has been argued [49] that the potentially traumatic events, especially in conflict-affected populations, should not be viewed as events placed in the past and finite but rather as enduring traumatic stress with realistic threat of present and future danger. As such, the psychological impact of traumatic exposure should be understood as “continuous traumatic stress”.

We distinguished between PLEs and bizarre PLEs, where bizarreness was evaluated by local health workers (who conducted the interviews). This distinction enabled us to further investigate differences between the self-reported PLEs and subjective evaluation of these by local health workers. A comparison between the patterns of risk factors for PLEs and bizarre PLEs revealed several similarities and some differences: exposure to potentially traumatic events, having traditional belief, being unemployed and having no regular income were risk factors for having PLEs and bizarre PLEs. However, rural residency emerged as risk factors only for PLEs and not for bizarre PLEs.

The strong association between unemployment and lack of regular income with (bizarre) PLEs may be due to probable higher level of functional impairment amongst individuals with PLEs [5]. This can also be due to a higher level of stigma towards these individuals [50]. The positive association between traditional beliefs and having bizarre PLEs is an interesting finding that needs further investigation.

Our result showed that bizarre PLEs are not significantly associated with psychological distress when controlled for

level of trauma exposure and socio-demographic risk factors. Limited numbers of studies have compared the impact of PLEs versus bizarre PLEs on level of distress. The results of these studies, contradictory to our results, showed that bizarre PLEs (compared to non-bizarre PLEs) were more likely to predict distress, depression and reduced general functioning [8, 51, 52]. However, comparison of our results with the above mentioned studies is not forthright as these studies are conducted in general or clinical adolescent populations in high-income countries [8, 51, 52]. In addition, in the current study we assessed life time PLEs and current psychological distress.

When interpreting the prevalence of PLEs/bizarre PLEs and the association with trauma exposure, several issues should be considered. We have not examined the presence of psychotic diagnosis or dissociative condition in this study. The extent to which the reported prevalence is constituted by psychotic and dissociative disorders is thus uncertain. Previous studies have found great comorbidity between dissociative and psychotic experiences [53, 54]. The bizarreness of the participants’ self-reported PLEs were evaluated by interviewers who were familiar with the culture. However, the reliability of this differentiation is not formally measured. Furthermore, although the instruments used in this study have been widely used internationally in different cultural settings and the interviewers were familiar with the socio-cultural setting, no formal socio-cultural validation was conducted which may pose a bias to our results. In fact, not all participants scoring positive for PLE have necessarily any serious psychopathology, since it may to some extent reflect common explanatory models and culture specific idioms of distress in this population, for instance evil eye, spirits, influence of ancestors or bewitchment [e.g. Patel 1995 (55)]. The socio-cultural analysis of the underlying psychopathology, explanatory models, attributional style and illness behaviour in relation to reported PLEs should be pursued in future studies. Further studies are also needed to clarify the complex relationship between ongoing potentially traumatic events/atrocities and PLEs among conflict-affected populations.

Conclusions

While the impact of potentially traumatic events in the form of PTSD and depression has been well documented, less attention has been paid to PLEs in conflict-affected populations. The result of the current study showed that negative mental health outcomes related to exposure to potentially traumatic events in the conflict-affected settings extend beyond PTSD and depression. Aid providers and health workers should consider the significance of

traumatic experiences and socioeconomic disadvantages as strong risk factors for PLEs.

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Compliance with ethical standards

Conflict of interests On behalf of all authors, the corresponding author states that there is no conflict of interest.

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