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Trauma- and Stressor Related Disorders in the Tuareg Refugees of a Camp in Burkina Faso

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Abstract: *Background:* Post-traumatic stress disorder (PTSD) is reported to be common among refugees. We set out to explore risk of Trauma- and Stressor-Related Disorders and the associated burden of psychological distress in a refugee camp of Malian Refugees in Burkina Faso.

Methods: One out of five persons living in the camp was selected randomly and interviewed using the French version of the Short Screening Scale for PTSD and the validated K6 scale to measure psychiatric morbidity.

Results: Around 60% of the interviewed sample (N=408) met the criteria for Trauma- and Stressor-Related Disorders and also reported severe mental distress on K6 scores. Women aged 40 and over were found to be at higher risk of Trauma- and Stressor-Related Disorders whereas young people (39 or younger) scored higher on K6 ratings. Around 83% of the surveyed subjects had a family member killed in the war, 91% a relative in the war, more than 80% had a family member suffering from physical injuries, and 90% reported problems with food and housing. The frequency of these life events was not surprisingly higher in persons with Trauma- and Stressor-Related Disorders, with the death of a family member and severe problems with food being specifically related to them.

Conclusion: These results point to important psychological suffering in a population that is often ignored by the media and international political authorities. Immediate steps are required to provide urgent legal and humanitarian protection to those who are forced to flee their homes and cross international borders because of disasters.

Keywords: PTSD, Screening, War, Touareg.

1. INTRODUCTION

Post-traumatic stress disorder (PTSD) is a condition that results from the exposure to a traumatic or stressful event producing a variable expression of distress as a result of the traumatic experience [1]. The kind of trauma capable of inducing PTSD involves both a concrete menace to the subject's own survival and the subjective impression of impotence in face of the event. The exposure to the trauma is a prerequisite to link the event to subsequent development of anxiety or fear-based symptoms, anhedonic and dysphoric symptoms, externalizing anger or aggressive symptoms, dissociative symptoms, or some combination of these symptoms [1-3]. It is expected that the disturbance causes clinically significant distress or impairment in the individual's social interactions, capacity to work or other important areas of functioning. The DSM-5 moved the PTSD from the anxiety disorders section to an autonomous section, including Trauma- and Stressor-Related Disorders, on the ground that the reaction to severe stressful events is dimensional, with the PTSD at the extreme end of a continuum of symptoms occurring in reactions to a trauma [1, 4].

Current diagnostic criteria specify that the trauma activating the PTSD result from various scenario, in which the individual directly experiences the traumatic event; or witnesses the traumatic event in person; or learns that the traumatic event occurred to a close family member or close friend (with the actual or threatened death being either violent or accidental); or, finally, experiences first-hand repeated or extreme exposure to aversive details of the traumatic event (not through media, pictures, television or movies unless work-related) [1-4].

War is a situation in which people are likely to be exposed to traumas of the sort expected to cause PTSD, both as a direct exposure to traumatic experiences menacing the individual's chances of survival or by witnessing closely beloved being exposed to trauma and by directly experiencing first-hand repeated or extreme exposure to aversive details of the traumatic event. War refugees were reported to suffer an enhanced risk of of psychological stress among refugees with relatively high levels of physical and psychological dysfunction in them [5]. The majority of the refugees had witnessed armed conflict, persecution [6], and imprisonment. Refugees are expected to suffer a high prevalence of PTSD

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and depression. In past studies, the prevalence of PTSD in refugees from war zones was found to vary from 15.8% in Ethiopia to 37.4 in Algeria, and it varied as well the presence of "any severe disorder", as measured by interview, from 17.5% in Ethiopia to 60.5% in Algeria [5].

After the rebellion of Northern Mali in 2012. hundreds of thousands of Malians are sheltering in camps in Niger, Burkina Faso and Mauritania, having fled the north of Mali after it was seized by Islamist rebels in 2012 or the South or the south of Mali for fear of retaliation from other ethnic groups. In December 2012, there were around 257,000 refugees from Mali in the western Sahel region [5]. They had to cross the borders to semi-desert areas of Niger, Mauritania and Burkina Faso, which are poor countries with serious food-supply problems, thus these refugees going through "an enormous level of suffering and deprivation" [5]. The dramatic condition of these people "did not find until now the attention of the international community" [5].

The vast majority of the refugees in these refugee camps were women, children and elderly people of the Tuareg ethnic group. Adult males remained in their home country to fight the war. After ousting the Malian Army and declaring independence, they were themselves subsequently ousted by the Islamists of Ansar Dine and Al-Quaeda groups. In fact the majority of the Tuareg is engaged in the Mouvement de Liberation de l'Azawar (MLNA). People in the camp are living under threatening conditions with only limited information about the fate of their close or distant relatives and uncertainty about their own future and the future prospects of those they have left behind. They are aware that difficulties will be experienced further by the Tuareg people in Mali, and these foreseen difficulties make prospects of their immediate return very unlikely.

This study was conducted with the objective of ascertaining the impact of stress in the people living in a Malian Refugee Camp in Burkina Faso, the Soubgandé camp. In post-conflict settings, PTSD is not only associated with experience of conflict violence, but also with a range of other stressors (e.g., quality of camps, daily difficulties) [5]. These conditions (poor shelter housing, forced social isolation, and lack of food [7]) were also reportedly common in the Soubgandé camp. The continuing concern about loved ones left behind or in the camp itself along with uncertainty about their future is likely to create a persistent state of hypervigilance in the refugees, a state that may maintains or worsens the symptoms of PTSD [8]. A lack of protection and support as well as the lack of acknowledgement of these conditions by the international community were reported to be associated with a higher risk of mental distress and psychopathology in refugees [9].

Since the majority of the Tuareg is engaged in MLNA, is likely that many refuges had witness the violent death of a loved relative or had received first-hand details about the violent death of a loved one. Moreover, the Tuareg population was hit by the war when being already in a situation of economic and financial difficulty. On this ground, we hypothesized that the prevalence of PTSD symptoms in the refuges of the Soubgandé camp would by higher than in past studies on refugees from war zones. The distribution of PTSD symptoms by age and gender was investigated as well, on the ground that the societal organization of Tuareg makes necessary targeted intervention according to the age and gender status of the individual.

2. METHODS

2.1. Sample

The data were collected in the refugee camp of Soubgandé in Burkina Faso between August and October 2012.

A list of people who lived in the camp was available based on the timing of their of arrival in the camp. All those who were under the age of 16 were excluded. Each person was given a number between 1 and 5 and one person from each of the five was approached to participate in the study using random numbers. Thus there was an equal chance for every individual in the camp to be selected.

At the time of the study, 2085 people aged 18 years or older were living in the camp. Thus using 1 in 5 ratio, a total of 417 people were selected, 180 men and 237 women.

2.2. Procedure

After obtaining the consent of the authorities of the camp, the study was presented in a brief meeting with key people in the camp. The rationale and purpose of the study were explained and support of these key individuals sought and any concern they raised addressed. They were then asked to take on the responsibility for informing the rest of the members in the camp. Interviews were conducted at a mutually convenient time and a place where privacy was possible.

Each subject taking part in the study was interviewed in French by one of the authors (FWO); Following a brief introduction and explanation on the tools, the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder [10] and the K6 screening scale [11] were administered. The French version of the K6 scale had been validated previously [12] and adapted for the French-speaking countries of West Africa [13]. We selected these instruments because they are widely used in epidemiological research and because they are short and simply and previously validated among the French-speaking people of West Africa [13].

2.3. Measures

The K6 Scale was developed for use in the U.S. National Health Interview Survey [11]. The original validation study found that the scale performs quite well when discriminating between cases (serious mental illness) and non-cases. The French validation study [12] found that a threshold score of 10 had a sensitivity = 0.92 and a specificity = 0.62. A validation study in the French language of West Africa in Burkina Faso, in a population of the same area to the present population but of different ethnicity, found an area under the curve of 0.75. To estimate prevalence of depression, authors recommend cut-offs between $\geq$9 and $\geq$11; at cut-off $\geq$10 K6 shows a sensitivity of 0.59 and specificity of 0.85 [13].

We made some changes to the K6 original tool. The duration of symptoms was confined to the previous 30 days. In addition, information was gathered on physical ill health as to how many medical consultations the individual had in the same time period. The prevalence of serious cases of mental

illness in the sample was calculated using the cut off point of 13 at K6, higher than the cut-off of 10 suggested by the two French validation studies, but in agreement with a pilot validation study in a small sample of Tuareg Refugees from Mali living in Paris (see below). This decision was taken in order to minimize the risk of false positives, and identify people at risk of PTSD and very high distress.

The Short Screening Scale for DSM-IV Posttraumatic Stress Disorder has been derived from the Modified DIS/Composite International Diagnostic Interview for Assessing PTSD [10]. It is a seven-symptom screening scale for PTSD according to the DSM-IV criteria; five of the symptoms deal with the avoidance and numbing syndrome, two with the hyperarousal syndrome. The original validation study showed that a score of 4 or greater defines positive cases of PTSD with a sensitivity of 0.80, specificity of 0.97, positive predictive value of 0.71, and negative predictive value of 0.98. The prevalence of PTSD in the sample was measured using the cut off ≥4, as indicated in the literature and confirmed in the pilot validation study (see below).

It is likely that different stressful events will have different effects on the genesis and maintenance of Trauma- and Stressor-Related Disorders. Breslau *et al.* [10] pointed out that previous epidemiologic studies have typically asked respondents to report their PTSD symptoms only in connection with their worst or most upsetting trauma. Past studies had used this strategy because many respondents report multiple traumas, precluding a detailed assessment of PTSD for each trauma. However, this strategy leads to an overestimation of the conditional risk of PTSD and might bias the estimates of the comparative risk of PTSD across different traumas. The version used in this study listed the five most significant traumas likely to have occurred to the refugees of the camp: the death of a family member; family member far away in war; severe problems with food; injury or physical damages; poor housing; and an open-ended event assessing "other cause". Strictly speaking these events are not the kind of trauma expected to cause PTSD, and we were unable to ascertain whether the death of a loved one was by violence or the informant was exposed to details about such a violent death, nor we were able to establish whether injury or physical damages did occur with dynamics that are compatible with a trauma causing PTSD. However, in a broad sense all these events are likely to cause intense stressor-related symptoms and disorders, and the recent classification of the DSM-5 corroborates the existence of a continuum of symptoms occurring in reactions to a trauma [1].

2.4. Pilot study

To evaluate validity and the best cut-off of both screening tools in the Tuareg population, a pilot study was conducted before the start of the main study on a small sample of Tuareg refugees from Mali living in Paris (N=41). As a gold standard the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) was used [14]. For the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder, a cut-of ≥4 was found to have a sensitivity of 0.66 and specificity of 0.55 against the diagnosis of PTSD at the SCID. For any mental disorder on the SCID with a score of "severe" as far as the level of distress associated to the disorder was concerned, the best cut-off for K6 was at ≥13, with sensitivity of 0.75 and specificity of 0.59.

2.5. Statistical Analysis

Scales' reliability was assessed with the intraclass correlation coefficient (ICC), with 95% Confidence of Interval (CI). The ICC is dimensionless statistics: ICC values ≥ .60 are considered acceptable for clinical use [15].

The prevalence rates of PTSD-related disorders were calculated by sex and age. The presence of severe mental disorders as assessed by the K6 was calculated by sex and age, too. To this purpose, age was dichotomized (above and below 40 years old). All analyses estimated the impact of predictors (sex, age and type of trauma) on two outcomes: caseness on the Short Screening Scale for PTSD, according to the cut-off, and caseness on the Short Screening Scale for PTSD among those who scored positive on the screening for severe mental disorders (K6), since these participants are likely to have PTSD-related symptoms of clinical relevance, i.e. they should be offered treatment.

Statistical significance was calculated using the χ^2 test in 2x2 tables. Odds ratio 95% confidence intervals (OR 95% CI) were calculated using Miettinen's method [16]. The variables measured by ordinal data were compared using the ANOVA one-way statistics or the Student t-test when appropriate.

Multivariate logistic regression analysis was used to assess the effect of several independent variables on PTSD or on distress. Age (> 40 vs 18-39 years of age), sex (females vs males) and specific life events such asdeath of a family member, family member far away in war, severe problems with food, injury or physical damage to self or others known to the individual and poor housing were considered as independent variables. The logistic regression analysis was performed according to backwards procedure, fitting all variables and sequentially discarding non-significant values (p enter = 0.05, p out = 0.10).

2.6. Ethics

The research was conducted in compliance with the Helsinki Declaration. Informed consent was obtained from each subject assuring them that their refusal to participate would not affect their care at all. Data were made anonymous at the source, and each subject was identified only with a code number. The ethics committee of the Azienda Mista Ospedaliero Universitaria, Cagliari, Italy expressed a positive opinion for the feasibility of the study that had been approved by the local camp authorities.

3. RESULTS

A total of 408 people (out of 417 selected) agreed to be interviewed (118 males, 43.8%). Nine subjects refused to take part in the study, but the demographic characteristics of these subjects did not differ from the total sample (males: n = 4; age: mean age = 36.5, SD = 16.3).

Men were 179 (44%) and women were 230 (56%). Mean age was 37.2 (SD = 15.3), with women modestly younger than men: 35.9 (14.5) versus 38.9 (16.2), t = 1.98, p = 0.048.

Table 1. Prevalence of Caseness on the Short Screening Scale for PTSD and the K6

	PTSD Related Disorders	Cases Positive on the k6	PTSD Related Disorders Positive on the k6
Males	152 (85.4%)	142 (79.8%)	119 (66.9%)
Females	198 (86.1%)	164 (71.3%)	133 (57.8%)
16-39 years old	202 (81.1%)	202 (81.1%)	158 (63.5%)
40 years old and older	148 (93.1%)	104 (65.4%)	94 (59.1%)
Death of a family member			
Yes	301 (89.1%)	239 (70.7%)	206 (60.9%)
No	49 (70.0%)	67 (95.7%)	46 (65.7%)
Family member far away in war			
Yes	323 (86.8%)	273 (73.4%)	228 (61.3%)
No	27 (75.0%)	33 (91.7%)	24 (66.7%)
Severe Problems with food			
Yes	327 (88.1%)	271 (73.0%)	231 (62.3%)
No	23 (62.2%)	35 (94.6%)	21 (56.8%)
Injury, physical damages			
Yes	296 (87.6%)	241 (71,3%)	203 (60.1%)
No	54 (77.1%)	65 (92,9%)	49 (70.0%)
Poor housing			
Yes	329 (87.5%)	276 (73.4%)	233 (62.0%)
No	21 (65.6%)	30 (93.8%)	19 (59.4%)

There were 81 male (45.3%) and 79 female (34.3%) participants over the age of 40.

3.1. Reliability of the Tools Used in the Study

ICC was 0.610 (95%CI: 0.515 – 0.640) for the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder and 0.699 (0.65 – 0.743) for the K6. Both values are in the acceptable range.

3.1.1. Caseness on the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder

In the sample, 350 subjects (85.8%) scored positive (point prevalence) on the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder (Table **1**).

Women were not more likely to score positive for PTSD-related disorders than men (OR = 1.18; 95%CI: 0.68 – 2.09). Older people were more likely to score positive for PTSD-related disorders than people younger than 40 years old (OR = 3.19; 1.59 – 6.38).

The difference by age was principally driven by older women being more likely to score positive for PTSD-related disorders than younger one (94.9% vs 81.5%, OR = 4.26; 1.44 – 12.64).

3.1.2. Caseness on the K6

There were 306 subjects (75%) scoring positive on the K6. Women were less likely to be positive on the K6 than males (OR = 0.56; 0.34 – 0.90), and older people were less likely to be positive on the K6 than people younger than 40 years old (OR = 0.41; 0.25 – 0.65).

3.1.3. Caseness on the K6 among those who screened positive for PTSD-related disorders

In the sample, 252 subjects (61.8%) scored positive (point prevalence) on both the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder and the K6.

There was no difference by sex (OR = 0.66; 0.44 – 0.99) or by age (OR = 0.79; 0.52 – 1.20) in the distribution of cases that were positive on both the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder and the K6.

3.1.4. Caseness for PTSD-related Disorders by Type of Trauma

The death of a family member was reported by 338 participants (82.8%); family member far away in war was reported by 372 participants (91.2%); severe problems with food were reported by 371 participants (90.9%); injury or physical damages were reported by 338 participants (82.8%); poor housing was reported by 376 participants (92.2%).

A backward logistic regression extracted the death of a family member (OR = 2.71; 1.41 – 5.21) and severe problems with food (OR = 3.26; 1.49 – 7.12) as the traumas more likely to be associated to be a case that was positive on the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder.

People who suffered the death of a family member (OR = 0.14; 0.04 – 0.47) and those who suffered personal injury or

physical damages (OR = 0.29; 0.11 – 0.76) were less likely to be a case on the K6.

No trauma was statistically related to be a case on both the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder and the K6.

3.2. Multivariate Analyses

We carried out a backward logistic regression analyses to identify the reliable determinants of PTSD-related disorders in our sample taking into account all confounding effects and interactions.

Older people (OR = 4.08; 1.41 – 11.75) and those who suffered current poor housing (OR = 3.88; 1.29 – 11.62) had the greatest chance of being positive on the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder (Wald = 91.50; df = 1; p = 0.0001; Nagelkerke R^2 = 11.6%).

Conversely, younger people (OR = 0.39: 0.21 – 0.73) were statistically less likely to be positive on the K6, with no other variable being related to this outcome when taking into account sex, age and the interacting effects of multiple traumas (Wald = 38.98; df = 1; p = 0.0001; Nagelkerke R^2 = 14.2%).

No variable was independently related to be a case on both the Short Screening Scale for DSM-IV Posttraumatic Stress Disorder and the K6 (Wald = 5.58; df = 1; p = 0.018; Nagelkerke R^2 = 2.4%).

4. DISCUSSION

To the best of our knowledge, this study is the first report trying to quantify the burden of PTSD symptoms in a sample from a refugee camp in the Sahel region bordering with Mali.

Around 60% of the sample met the screening criteria for PTSD with K6 scores indicating the presence of severe mental distress. Each of the five serious life events had been experienced by over 80% of the sample, and that each respondent had experienced on average four out of these five events. People who had experienced the death of a family member and severe problems with food were more likely to score positive for a Trauma- or Stress or-Related Disorder.

The fact that over 90% of respondents reported problems with food and housing reflects that this camp, like most camps in the region, received very little aid at all at the time of the study [6] and was struggling to provide basic minimum help to those most in need. It is likely that both acute and chronic stressors act as risk factors increasing the chance that a mental disorder will develop.

Approximately 83% of the participants had a family member killed in the war, and 91% had a relative in the war. At the time of the study it was difficult for individuals to receive any direct news from the war front, although people were aware in broad terms that the Tuareg army was routed by the Islamists. There was further uncertainty associated with suggestions that international authorities were preparing a military intervention against the rebels, further spreading the risk of war in the area.

It should be pointed out that those who suffered the death of a family member and those who suffered personal injury or physical damages were statistically less likely to be a case on the K6, a possible reflection of Tuareg being proud to have themselves or their family involved in the war. Longitudinal follow-up studies are necessary to evaluate whether the finding is stable or does vary as an effect of the time.

Overall, these findings indicate serious psychological suffering in a vulnerable population, with prevalence rates that are higher than those found in past studies. In previously reported studies from Ethiopia, Algeria, Gaza, and Cambodia [5], PTSD rates in refugees were much lower than those found in Soubgandé (from 15.8% in Etiopia to 37.4 in Aleria) as well as the presence of "any severe disorder" (from 17.5% in Etiopia to 60.5% in Algeria). In the multicenter study cited above [5] highest rates of forced social isolation were reported from Algeria (61%). Furthermore from Cambodia 41% had PTSD was related to paucity of food, which is much lower than in the sample in Soubgandé . This may reflect a lack of resources related to a lack of international recognition and aid . Only the Ethiopian sample showed a rate of poor shelter conditions similar to those found in this study (98% vs 94%) [7], confirming, the importance of physical environment on the mental health of refugees. Moreover, the absence of the intervention and protection by the international community may further contribute to a sense of abandonment further contributing to distress as proven in previous studies [9, 17].

Our study confirms the findings of another study using similar methods in the Shael region. Using two screening tools for PTSD and general psychiatric disorders (Posttraumatic Stress Disorder Checklist and the General Health Questionnaire, GHQ-28), Hamid and Musa [18] found 54% PTSD-positive subjects and 70% positives to general distress in three camps located around the towns of Fasher and Nyala in Darfur. PTSD frequencies similar to our study have also been reported in a sample of Darfuri female university students at the Ahfad University for Women [19] where 80.9% of the Darfuri student sample met the DSM-IV criteria for post-traumatic stress disorder symptoms. Exposure to war conditions in that study was similar to our sample. More than half (54%) of that sample reported having personally experienced or witnessed a mean of 28.2 war-related traumatic events out of a list of 40. About two-thirds of those who had personally experienced or witnessed war-related traumatic events had been in a combat situation, witnessing someone being killed, or beaten or seeing corpses. Nearly 60% had family members or friends suddenly disappear or kidnapped, and 42% reported being forcibly removed or denied access to their villages, and so were forced to flee their homes [19]. However, the settings of these two studies were different and some of the differences may be explained by the sites and different samples.

In our study, adult and elderly women (aged 40 or more) were at higher risk for PTSD symptoms, but as a relative portion of them did not actually reach the screening criteria for severe mental illness on the K6. Similarly, young people

(39 or younger) were shown to have relevant psychopathological symptoms with higher K6-positivity frequencies than the oldest, but this difference disappeared when comparing people with both K6 and PTSD screening positivity. One possible explanation could be that older women may be better at identifying the illness as being related to stressful events, even when the distress does not reach the threshold of a full-blown disorder. On the other hand younger women report more discomfort but may not always see a direct relationship with stressful events. The result is similar to the finding that young people's suffering due to acute stress is not necessarily a consequence of PTSD symptoms [20,21]. The risk of PTSD by gender in this study sample is different from other populations have been subjected to wars [22, 23] or to other natural disasters conditions [24]. This is probably due to the specificity of the situation and the population studied.

4.1. Limitations

Given the difficulties due to the circumstances in which the study was to be carried out, we had to adopt a very simple methodology and use the simplest screening tools that had been validated. This simple method has an inherent weakness and reflects problems in reaching: psychiatric diagnoses using tools developed in other cultures. However, there are no culture-specific assessment tools for PTSD available [25]. Cross-sectional studies can only provide hints, and longitudinal studies only can provide causal factors.

5. CONCLUSION

These results indicate important psychological suffering in a vulnerable population whose conditions of absolute poverty have been exacerbated by the recent war. These conditions in this geographical area were rarely described and have never received humanitarian aid. Immediate steps are required to give legal and humanitarian protection to those who are forced to flee their homes and cross international borders because of the crisis. Long-term outcomes need to be explored so that appropriate interventions are put in place on both the short and medium-term.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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AUTHORS' CONTRIBUTIONS

MGC conceived of the study collaborated to the statistical analysis and drafted the manuscript. FWO participated in the design of the study and carried out the interviews, MFM participated in the design of the study, developed the interview and helped to draft the manuscript. DM, AM and AP performed the statistical analysis. DB participated in the design of the study and helped to daft the manuscript. All authors read and approved the final manuscript.

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