

Exploring Psychological Distress in Burundi During and After the Armed Conflict

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Received: 25 October 2014 / Accepted: 13 June 2015
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Abstract We assessed symptoms of psychological distress among a population-based sample of 9000-plus adults in Burundi during (1998) and after (2007) armed conflict. After exploratory and confirmatory factor analysis to an 8-item, self-report measure, we identified two domains of psychological distress “Depression/Anxiety” and “Functioning” with good fit to data. The questionnaire was invariant in males and females. Depression and Anxiety symptoms during conflict were more frequently reported than Functioning symptoms; all symptoms were more frequently reported by women. Psychological distress was found in 44 % of individuals during conflict and in 29 % 2 years after the conflict. Results call for further research in Burundi that can inform the development of mental health interventions.

Keywords Depression · Anxiety · Functioning · Factor analysis · Armed conflict · Burundi

Introduction

Studies consistently report high levels of psychological distress amongst populations affected by war and armed conflicts (Perla and German 2012; Steel et al. 2009; de Jong et al. 2003). High prevalence of psychological distress has been documented, mainly PTSD and depression, in post-conflict settings even many years after the conflict (de Jong et al. 2001; Fazel et al. 2005; Priebe et al. 2009; Marshall et al. 2005).

The bulk of research on psychological distress in low- and middle-income countries (LAMIC) has been carried out in non-representative samples of refugees, internally displaced or re-settled individuals (de Jong et al. 2003; Jones et al. 2007; Lindert et al. 2008; Onyut et al. 2009; Roberts et al. 2008) and relatively few population-based studies of psychological health of adults in conflict areas have been executed (de Jong et al. 2001; Johnson and Thompson 2008; Lopes Cardozo et al. 2000). Because of the small number of studies, limited empirical research is available on the characteristics of psychological distress in LAMIC, where mental health outcomes may differ by contextual determinants of mental health generally higher in such contexts, such as exposure to multiple traumas, and difficult living conditions from a destruction of political, economic, socio-cultural and health infrastructures are frequent and pervasive (Patel 2007).

An additional restriction of the current literature regards an over emphasis on single psychiatric categories as the sole reaction to mass violence. Concerns have been raised regarding the appropriateness and utility of assessing individual illnesses or disorders using a predominantly medical and western model of psychiatry to assess psychological distress in war-affected populations (Almedom and Summerfield 2004; Miller et al. 2006). The argument is

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more specifically directed to the cross-cultural applicability of PTSD and its use as the sole model to characterize suffering among war-affected populations (Breslau 2004), despite the possibly wide ranging and complex psychological effects of war-related trauma (Johnson and Thompson 2008).

Here we report on the dimensionality of psychological distress as captured by an 8-item self-report questionnaire applied to adults in Burundi who took part in a national household survey. Burundi is one of the poorest nations in the world that has also endured a long-standing armed conflict where most of the population was exposed to some level of trauma. Data from the analysis presented here was collected during two crucial time points; during (1998) and after (2007) an armed conflict. At present, there is a paucity of epidemiological data from Burundi that can inform seriously needed mental health interventions. Using a general population sample, the present study provides a unique opportunity to explore psychological distress in a context of violence and political instability in a non-western adult population.

As alternative to categorical disease outcomes, *psychological distress* has been suggested as a more flexible term that can be of valuable use in non-western populations, where applicability of specific disorders may be less appropriate due to different cultural responses and symptoms (Miller et al. 2006). This general expression of psychopathology includes negative moods, malaise, poor daily functioning and symptoms of common mental disorders such as depression, anxiety and traumatic stress (Roberts and Browne 2011; Rasmussen et al. 2010; Miller et al. 2006; Fernando et al. 2010).

Given the wide spread violence and long duration of the armed conflict in Burundi and based on the existing literature, it remains critical to investigate how psychological distress in this population is conceptualized so that opportunities for intervention can be identified.

Methods

Sampling

We analyzed data from two cross-sectional, household surveys in Burundi (Bundervoet et al. 2008) implemented by the Burundi National Institute of Statistics and Economics (ISTEEBU). In the first survey (1998) 586 clusters were randomly selected from 8300 districts nationwide. Ten households were randomly selected per cluster and all adults present (18 years and older) in the selected households were interviewed. To minimize participant and enumerator burden, the psychological distress questionnaire was administered to households in a randomly

selected 50 % of the clusters. A total of 5599 individuals completed the psychological health questionnaire in the 1998 survey with a response rate of 86.5 %.

Budget constraints limited the second survey, 2 years after the cease-fire was signed (2007), to a random sample of 100 rural clusters; representing approximately 1000 households, from which 874 were located and re-interviewed. Death and migration were the most common reasons why 126 households were not included in the follow-up. In 2007 a total of 3412 individuals were surveyed with a response rate of 88.4 %. All adults surveyed in 2007 were administered the psychological distress questionnaire. Interviews in both surveys were carried out by trained enumerators and took approximately 150 min to complete.

Measures

Participants completed a brief socio-demographic questionnaire that included sex, age and marital status. To assess psychological distress, a team of psychologists from the University of Burundi constructed a self-report measure based on the French version of the General Health Questionnaire 12-item version (Goldberg et al. 1997). This resulted in an instrument with 8-items in Kirundi, the local language. The final version of the 8-item questionnaire was pilot-tested in a sample of adults from Bujumbura with no further changes made.

The 8-item questionnaire recorded psychological distress symptoms in the past 2 weeks with yes/no as option answers corresponding to a 1 or 0 score. Following the same structure as the GHQ, items can be classified as either positively or negatively worded. Items 3, 4, 6, and 8 in the psychological distress questionnaire were positively worded (i.e. strong enough to continue current activities) while questions 1, 2, 5 and 7 were negatively worded (i.e. feel sad and discouraged). To score the measure, we applied a binary or bi-modal scoring system (Goldberg et al. 1997) that ascribes zeros for positive responses (i.e. 'yes') in positively worded items and reverse-scored in negatively worded items. These were summed to produce a total score, which was compared with a threshold for 'caseness'. This is the likelihood that a diagnosis will be made if the respondent would undergo a full psychiatric assessment.

Data Analyses

Comparisons of demographic characteristics and symptom endorsement between the two surveys were done contrasting means and proportions using designed adjusted t tests and χ^2 tests, respectively. Internal consistency of the 8-item questionnaire was evaluated using Cronbach's α coefficient (Cronbach 1951). These analyses were performed using the survey module (*svy*) of the STATA

version 11 software (College Station, TX: StataCorp LP 2009).

Exploratory and confirmatory factor analyses (EFA and CFA, respectively) were performed with Mplus 6.1 (Muthén and Muthén 1998–2011), with weighted least squares with robust standard errors and mean- and variance-adjusted χ^2 (WLSMV) estimation, including sampling weights and a cluster variable.

The analysis was carried out in two phases. First we carried out EFA of the 8-item questionnaire in the 1998 survey, extracting factors based on assessment of the eigenvalues (selecting factors with a value close to 1), graphically representing the eigenvalues to visually analyze the relative importance of the factors, (scree plot), and a parallel analysis (comparing the number of real eigenvalues that are greater than the corresponding expected values from random data) (Muthén and Muthén 1998–2011). Un-correlated and correlated rotations of factors were compared, using the root mean square error of approximation (RMSEA) and the standardized root mean residual (SRMR), where lower values indicate better fit and good models are considered to have a RMSEA or an SRMR of 0.05 or less.

In the second phase of the analysis we verified the structure of the 8-item questionnaire using CFA in the 2007 survey data. Five goodness-of-fit indices were used to evaluate the adequacy of the model: the comparative fit index (CFI) (Bentler 1990), the Tucker Lewis Index (TLI) (Bentler and Bonett 1980; Tucker and Lewis 1973), the standardized root mean square residual (SRMR), and the root mean square of approximation (RMSEA) (Steiger 1990). Values equal to, or greater than, 0.95 for the CFI and TLI, and values lower than 0.05 for the RMSEA and SRMR, were considered indicators of excellent model goodness-of-fit (Bentler 1990).

Finally, we tested the measurement invariance between males and females from the 2007 survey using a multiple-group approach (Dimitrov 2010). We defined the following models: (1) Model A: the number and pattern of factors are equal across groups/time, (2) Model B: Model A plus the additional constraint that factor loadings are invariant across groups/time, and (3) Model C: Model B plus the constraint of equal item thresholds across groups/time. Increment of fit between (1) Model A and Model B, and (2) Model B and Model C were compared with the Satorra–Bentler scaled difference χ^2 test (Satorra and Bentler 2001). Invariance of the parameters tested was accepted if the χ^2 difference was non-significant set at a 0.05 level of significance.

The Johns Hopkins School of Public Health Institutional Review Board approved this secondary analysis of pre-existing, de-identified, not publicly available data, on the basis of not qualifying as human subjects research as

defined by the Department of Health and Human Subjects regulations. Study participants provided written informed consent and were not compensated for their participation. The Burundi Priority Surveys were sponsored by the MICROCON project under the European Union 6th Framework. All authors certify their responsibility for this manuscript.

Results

Exploratory Factor Analysis (EFA)

Results suggest a two-dimensional structure, with the two-factors jointly accounting for 46.7 % of the variance. The first factor accounted for 30 % of the variance and was defined by 4 items (*Have sleepless nights or nightmares, Feel anxious without any reason, Feel sad and discouraged, Get angry without apparent reason*) relating to concepts of Depression and Anxiety. The second factor, explaining 16.6 % of the variance, included the items *Feel that activities are useful, Feel I can overcome difficulties, Feel strong enough to continue current activities, and Think about future plans*, which can relate to the ability to perform daily activities and cope with problems, here named Functioning. The two factors evidenced good fit according to explored indices [$\chi^2(13) = 117.453$, RMSEA = 0.038, RMSR = 0.038]. Adequacy of this model was reinforced by the parameter estimates; all factor loadings were high, positive, and statistically significant (p value >.05). The relationship of each of the items to the underlying factors is expressed by the factor loading. Factor loadings that permit assignment of an item to a specific factor exceeded 0.40. Since factor loadings can be interpreted as standardized regression coefficients, another interpretation would be that all items from the 8-item questionnaire displayed a strong correlation (>0.40) with their corresponding factor. The proportion of variance in each factor that was explained by the observed variables was high (0.93 and 0.91, respectively), supporting the fit of the model. Factor inter-correlation was 0.32.

The structure by sex yielded analogous results. The un-correlated two-factor model showed good fit with data in men [$\chi^2(13) = 60.362$, RMSEA = 0.037, RMSR = 0.042] and women [$\chi^2(13) = 76.955$, RMSEA = 0.038, RMSR = 0.042]. This model revealed the same item groupings separately in males and females, with factor loadings that permitted assignment to a factor exceeding 0.40.

Confirmatory Factor Analysis (CFA)

Results from the CFA using the 2007 survey data showed that a two-factor structure had excellent model fit, with TLI and CFI values equal to 0.96 and 0.97, respectively, and

RMSEA values < 0.05 . Factor loadings in the CFA model confirmed the structure observed in the EFA from the previous analytical phase; factor loadings were above 0.40 for all items. To determine measurement equivalence of the 8-item questionnaire across sex, we conducted tests of invariance between men ($N = 1639$) and women ($N = 1773$) following the sequential constraint imposition approach. The multigroup model with equal factor structure (Model A) fit the data well [$\chi^2(38) = 89.06$, RMSEA = 0.025, CFI = 0.98, TLI = 0.96]. In Model B, factor loadings were constrained to be equal across sex. The χ^2 difference test supported the invariance of factor loadings across groups ($\Delta\chi^2 = 6.56$, $p = .36$). Model C imposed the additional constraint of equal item thresholds, obtaining no support for invariance ($\Delta\chi^2 = 21.44$, $p = .002$).

The Cronbach's α value of the 8-item questionnaire in the 1998 survey was 0.66, and item correlations with the overall scale ranged between 0.26 and 0.72, with the lowest correlation corresponding to item *Feel useful* and the highest to item *Feel sad and discouraged*. Internal consistency analyses in the 2007 survey showed a similar reliability coefficient of 0.77. In the 2007 survey, correlations of each item with the scale ranged from 0.29 to 0.75, with the lowest and highest corresponding to again to items *Feel useful* and *Feel sad and discouraged*, respectively. Reliability did not increase for either study period after removing lowest correlated items.

The most frequently endorsed item in both surveys was *have sleepless nights or nightmares*, reported by 46 % of respondents in 1998 and 44 % in 2007, followed by *feel sad and discouraged*, reported by 41 and 35 % of participants, respectively. At both time points, more women reported psychological distress symptoms compared to males. Using a threshold for 'caseness' of a total score of 3 or more in the 8-item questionnaire, 44 % of individuals during the conflict and 39 % after the conflict could be experiencing some form of psychological distress.

Sex distribution in the two surveys was comparable; females represented slightly more than half of the respondents in both surveys (55 % in the 1998 survey; 52 % in the 2007 survey). The mean age of participants in 1998 was slightly lower (31.6 years, $SD = 0.30$) compared to that in 2007 (34.5 years, $SD = 0.48$). Nearly 60 % reported being married at both time points.

Discussion

The items comprising each dimension of psychological distress identified here as: Depression and Anxiety (*Have sleepless nights or nightmares, Feel anxious without any reason, Feel sad and discouraged, Get angry without apparent reason*), and Functioning (*Feel that activities are*

useful, Feel I can overcome difficulties, Feel strong enough to continue current activities, and Think about future plans) resemble the structural characteristics of the GHQ-12 as described across different countries and settings (Werneke et al. 2000; Politi et al. 1994; Gureje 1991; Kalliath et al. 2004). Specifically, factor loadings and patterns for the 8-item psychological distress questionnaire resemble what Werneke et al. (2000) reported; with items on insomnia and strain (*Have sleepless nights or nightmares, Feel anxious without any reason*, respectively) loading together and usually along with the item related to depressed emotion (*Feel sad and discouraged*).

Several findings from this study are meaningful because they grant evidence of the stability of the measure. First, the two-factor model was adequate in both samples, in terms of model fit and factor loading patterns, and no cross-loading of items on factors. Second, we found evidence of measurement and structural invariance between men and women. This means that not only do the measured constructs have the same meaning across sex using this 8-item version of the GHQ-12, but also that the sex comparable estimates reflect true group differences and are not contaminated by sex-specific attributes unrelated to the construct of interest.

The correlations between the factors were low (0.32), suggesting that the two dimensions we identified as Depression and Anxiety and Functioning are independent. Careful review of item descriptions exhibits how the factors are conceptually different. The dimension Depression/Anxiety can be described as symptoms of mental disorder (including negative affect and anxiety) while Functioning could be considered to cover positive psychological functioning and affect. From a practical standpoint, a weakly correlated two-factor structure suggests the scale could be used as two separate subscales; implying that there can be incremental value in assessing separate dimensions and that a single summary score might not be sufficient for screening purposes and subsequent analyses.

Applying Goldberg's (2007) caseness threshold for the GHQ-12, over a third of individuals could be classified as positive for psychological distress during (44 %) and after the armed conflict (29 %). Although this cut-off score has not been validated for the 8-item scale used in our study, it can be useful to interpret our findings. The proportion of individuals positive for psychological distress at any time point in our study is comparable to the psychological distress reported for ex-prisoners of war in Lebanon (42 %) (Saab et al. 2003), but higher than what has been reported among different community settings including New Zealand (33 %) (Davis et al. 2008), Pakistan (17 %) (Kidwai 2014), and Nigeria (26 %) (Mba et al. 2008). The differences in prevalence figures could be partially explained by differences between the 8-item questionnaire and the

GHQ-12. Nonetheless, our findings support the proposal that despite the adaptation process of the GHQ-12 for the Burundian surveys resulting in a measure with only 8 items, this tool can serve to begin to understand psychological distress in this population and represents a minimum level of mental health and psychological distress related problems.

Another explanation is that the array of psychological distress symptoms expressed by Burundians might not be completely represented in the 8-item questionnaire, resulting in lower endorsement of items at either time point. Compared to the psychological distress syndromes found in a qualitative study exploring mental health perceptions among a community sample of adults in Burundi (Familiar et al. 2013), the 8-item questionnaire captures some but not all psychological distress symptoms. In this qualitative study, participants frequently reported the use of the local language (Kirundi) terms *ucutiyemera* and *ak-abonge* to describe several elements of the psychiatric concept of depression, such as low mood, sorrow, and lack of interest, symptoms that are similar to items from the 8-item questionnaire (i.e. *Being angry without reason, Nightmares/difficulty sleeping, Feeling sad and/or discouraged*). Ventevogel et al. (2013) also report mention of syndromes more closely related to traumatic stress, such as the Kirundi term *ihahamuka*, to describe fear and hyperarousal related to the psychological aftermath of traumatic events, which were not represented in the 8-item questionnaire.

Overall, symptoms of Depression/Anxiety were more frequently reported than those of Functioning. This finding is consistent with previous reports analyzing separately the 2 dimensions of psychological distress described for the GHQ-12 (Ip and Martin 2006). Symptoms of low Functioning, while generally less frequent than Depression/Anxiety symptoms at both time points, were slightly more frequent post-conflict. The few studies examining the subset of Functioning symptoms in trauma-affected populations have found similar results. For example, Toyabe et al. (2007) found low Functioning scores among a community sample of Japanese adults 2 years after experiencing the Niigata–Chuetsu earthquake. In a household survey of Kosovar Albanians after the Kosovo war, Lopes Cardozo et al. (2000) found poor levels of social functioning measured by the GHQ 28-item version. The Social Function dimension of psychological distress in the GHQ-12 is conceptually related to the ability to cope with daily problems. A possible explanation for our results is that at the time of the post-conflict survey in 2007 there might have been a genuine sense of despair and pessimism because although the war had officially ended, armed groups were still active across the country and there was a general sense of insecurity and mistrust (Uvin 2009).

Functioning was overall high among participants at both time points, which may indicate resiliency on the part of the population to the long-term traumatic events of conflict, understood as the emotional adjustment and social functioning of individuals and families despite exposure to significant adversity (Eggerman and Panter-Brick 2010). People that live in areas of conflict show various degrees of resiliency; some do well, some live in conditions of constant fear and others just get by. Levels of resiliency can be exhibited at various levels; violence and conflict can affect individuals, households, and communities through direct (i.e. changes in house composition, economic status) and indirect mechanisms (i.e. access to social services, employment market). Better knowledge of these factors could in turn result in more effective policy interventions to provide security and health to people affected by conflicts.

Our results confirm often-observed finding that compared to men, women report more psychological distress symptoms (Steel et al. 2009; Eytan et al. 2004). Burundi is a largely rural country made up of small communities sparse along remote hilltops. Women frequently endure long working hours in the field and economic hardship (Uvin 2009). Reports of rape and sexual assault against women during and after the armed conflict were rampant. Reports from neighboring DR Congo (Peterman et al. 2011) and Rwanda (Umubyeyi et al. 2014) give similar pictures. Although data from our study precludes further hypothesis testing, it remains critical to recognize that women in these contexts remain a vulnerable group for the development of psychological distress associated with conflict.

Currently, pockets of politic instability and violence continue to plague Burundi. However, only a couple of studies have been carried out in recent years; Yeomans and colleagues reported high levels of depression (40 %) and anxiety (61 %) among community adults (Yeomans et al. 2008) and internally displaced (Yeomans et al. 2010) Burundians. These results highlight the persisting mental health needs of the population, and call for more efforts towards the delivery of mental health interventions in the community.

There are several limitations to this study. Results are based on an adapted measure that resulted in a questionnaire with only 8 items. Because the number of items that make up a scale limits the number of factors that can be extracted, the likelihood of describing a 3 or 4-factor solution of this 8-item questionnaire was limited. However, the factor analytical procedure can shed light into the dimensionality of psychological distress, contributing to our knowledge of this population. An inherent limitation to self-report measures is the tendency of participants to respond the same way to similarly worded items, also termed method variance. This may influence how items

aggregate in construct factors. However, this effect is likely to have been comparable to other studies since we found a similar dimensional structure. Data available from the surveys precluded test of convergent and divergent validity. However, we approached construct validity by exploring the structure of the measure and relating results with the extensively studied GHQ-12. Similarly, procedures used to protect participant's privacy prevented assessment of test–retest reliability, limiting our analyses to the evaluation of the internal consistency of the questionnaire. More research is needed to establish the psychometric properties of the 8-item questionnaire. Lastly, the commonly used cut-off of 3 to define caseness has not been validated in this population and should be taken as indication of probable clinical symptoms.

Despite these limitations, the two surveys combined accrued more than 9000 individuals interviewed across Burundi. Analyzing the data from the BPS represents a valuable effort to answer the current gap in knowledge. First, data analyses were conducted using a large dataset from a low-income country with a population-based sampling design. As mentioned above, few studies of this nature are carried out in LAMIC. Results obtained can be generalized to similar contexts and add to our understanding on how psychological distress is experienced and reported in these settings. Second, surveys were conducted in two crucial time points associated with the armed conflict; during and after. Since the majority of assessments take place in the post-conflict setting, data from during the conflict is unusual and valuable.

The proportion of individuals with psychological distress during the armed conflict in Burundi was in the higher end (44 %) of what has been reported in other conflict settings, and this prevalence remained high (29 %) 2 years after the armed conflict. These figures emphasize the mental health needs of adults in Burundi and advocate for the development of prevention and treatment interventions. Individuals and communities exposed to armed conflicts and war can experience lasting mental health problems that do not easily revert when the violence is over. Mental health should be addressed several years into the post-conflict setting to promote development and bolster reconstruction efforts in conflict-affected communities.

Acknowledgments Data collection was financed by the MICROCON project under the European Union 6th Framework and was implemented in cooperation with the National Institute of Statistics and Economics in Burundi (ISTEEBU).

Compliance with Ethical Standards

Conflict of interest The authors declare no conflict of interest.

Ethical standard All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964

Helsinki declaration and its later amendments or comparable ethical standards.

Human and animal rights statement This article does not contain any studies with animals performed by any of the authors.

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