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Review article

Prevalence of depression and posttraumatic stress disorder in adult civilian survivors of war who stay in war-afflicted regions. A systematic review and meta-analysis of epidemiological studies

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ABSTRACT

Background: Epidemiological surveys on depression and posttraumatic stress disorder (PTSD) among civilian war survivors in war-afflicted regions have produced heterogeneous prevalence estimates of these conditions.
Methods: To determine the prevalence of both depression and PTSD in civilian war survivors in the area of conflict, we conducted a systematic search of Medline, PsycInfo, and Pilots databases. We included epidemiological studies that had used structured clinical interviews. We conducted random effects meta-analyses on prevalence proportions as well as univariate mixed model meta-regressions.
Results: We included 33 studies that assessed prevalences of depression (k = 18) and/or PTSD (k = 30). Across all studies, pooled point prevalences of 0.27 and 0.26 were found for depression and PTSD, respectively. Ten percent of participants fulfilled criteria for both disorders. Surveys with a higher mean age of participants reported higher prevalence of depression. Furthermore, samples with higher rates of unemployment and higher percentages of women reported higher prevalence of PTSD, whereas samples with a higher number of participants living with a partner reported lower prevalence of PTSD.
Limitations: The findings are limited by poor psychometric reporting practices.
Conclusions: Our findings suggest that both depression and PTSD are highly prevalent in war survivors who stayed in the area of conflict. Yet, future research on this topic need to focus on psychometric properties of instruments used to assess psychopathology among war survivors. Notwithstanding this limitation, there is an urgent need for large-scale mental health programs that are appropriate for war-affected countries with limited resources and address depression as much as PTSD.

1. Introduction

Since the end of the Cold War in 1989, more than half of the countries in the world have been affected by armed conflicts (Marshall & Cole, 2014) with a direct impact on the lives of millions of people. For various reasons, research on the mental sequelae of war experience has often investigated refugees in high-income countries. The overwhelming majority of war survivors, however, are civilians who live in areas of (former) conflict in low-and middle-income countries (LMICs; Brundtland, 2000). Most epidemiological studies on mental disorders in war survivors have focused on posttraumatic stress disorder (PTSD) and depression. If untreated, both depression and PTSD can become chronic, and contribute significantly to the global burden of disease (Kessler, 2012; Morina et al., 2014; Sabes-Figuera et al., 2012). Furthermore, comorbid depression and PTSD is characterized by significantly higher levels of psychopathological distress, including suicide risk, than either condition alone (Morina et al., 2013). A significant step in understanding the scope of the problem in war-afflicted countries is a reliable estimate of civilian war survivors with depression and PTSD that may inform current and future mental health policies in war-affected countries. This is particularly relevant for LMICs given their limited mental health services and impediments in adapting interventions to the mental health needs of their population (Saxena et al., 2007). In 2009, Steel et al. (2009) published a meta-analysis of surveys on the prevalences of PTSD and depression among populations exposed to mass conflict and displacement that included surveys in conflict-

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affected populations. The reported prevalences for PTSD and depression in the included publications varied greatly, from 0% to 99% for PTSD and 3% to 85.5% for depression, and the weighted prevalences were 30.6% for PTSD and 30.8% for depression. The authors, however, did not report prevalences of these disorders separately from surveys with war survivors who stayed in the areas of conflict. Furthermore, they used a rather wide definition of mass conflict to include surveys in their meta-analysis. For example, they included the survey by Stein et al. (2008), which was conducted with 4351 individuals in South Africa and did not necessarily include exposure to human rights violations as an inclusion criterion for the study. Surveys that include individuals without a history of exposure to mass conflict may skew the pooled prevalence of mental disorders in conflict-affected populations.

To our knowledge, no previous publication has focused on deriving a robust prevalence estimate of depression and PTSD among civilian war survivors. We aimed to determine, through a systematic review and meta-analysis, prevalences of depression and PTSD in adult civilians who have experienced war-related events and still live in areas of (former) conflict. We also explored study-level factors (e.g., type of sampling or gender) that might be associated with the occurrence of these two conditions (Steel et al., 2009).

2. Method

2.1. Identification and selection of studies

The aims and methods of this meta-analysis were registered with the PROSPERO database (CRD42016032720, http://www.crd.york.ac.uk/prospero). A survey was included if the country in which it was conducted was listed as war-affected by the Uppsala Conflict Data Program. The program defines wars as conflicts that generate 1,000 or more battle-related deaths in one calendar year (Pettersson & Wallensteen, 2015; Uppsala Conflict Data Program, 2016). The first and the second authors located relevant epidemiological studies in the computerized bibliographic databases Medline, PsycINFO, and PILOTS (PILOTS is managed by the United States National Center for PTSD). The search was conducted in September 2017 in *titles, abstracts* and *key concepts* using the following terms relating to the four categories: 1) Depression ("major depression/ OR depress*.ti,ab,id. OR MDD.ti,ab,id"); 2) PTSD ("posttraumatic stress disorder/ OR posttraumatic stress.ti,ab,id. OR post-traumatic stress.ti,ab,id. OR posttraumatic syndrome*.ti,ab,id. OR post traumatic syndrome*.ti,ab,id. OR PTSD"); 3) General mental health ("mental disorders/ OR mental health.ti,ab,id."), and 4) War victims ("genocide/ OR holocaust/ OR war/ OR (war OR wars OR warfare).ti,ab,id. OR "prisoners of war"/ OR mass conflict*.ti,ab,id. OR post-conflict*.ti,ab,id. OR political conflict*.ti,ab,id. OR armed conflict*.ti,ab,id. OR terrorism/ OR torture/ OR persecution.ti,ab,id. OR civilian*.ti,ab,id. OR ethnic cleansing.ti,ab,id"). The search was conducted such that at least one term in the categories depression, PTSD or general mental health had to be reported in titles, abstracts or key concepts in the respective database, along with one term for war victims.

Publications had to meet the following criteria: 1) a sample size of 50 or more participants with exposure to war-related events who were living in the area of former conflict at the time the survey was conducted; 2) participants had experienced war-related events within 25 years prior to conducting the survey; 3) at least 80% of the participants were older than 18 years; 4) depression and/or PTSD was measured with a structured psychiatric interview based on the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association, 1980) or International Classification of Diseases (e.g., ICD; World Health Organization, 1992) criteria for these conditions. Exclusion criteria were: 1) study participants had received mental health interventions; and 2) the sample consisted of combatants in armed forces or refugees. Similarly to Steel et al. (2009), studies conducted with Israeli participants were excluded because they usually involved a small group of the population who were exposed to specific terrorist attacks and are therefore not representative for the general population.

Relevant data from eligible publications were extracted using a self-construed codebook. The first and the second authors extracted the relevant data using the codebook. If a publication reported on more than one sample because the study was carried out in more than one country (e.g., Priebe et al., 2010), or because the study was conducted with different groups of war survivors (such as bereaved and non-bereaved survivors as in Morina et al. (2011), a separate codebook was filled in for each sample that fulfilled our criteria. For a given study, only samples that fulfilled the inclusion criteria for the meta-analysis were included. For example, the study by Basoglu et al. (2005) included a sample of war survivors from Bosnia as well as samples with refugees in Croatia and Bosnia. Consequently, only the data from the sample in Bosnia were included.

The codebook contained items that related to methodological factors, demographic factors, and trauma- and disorder-related factors. The following variables were used as study-level predictors and were assessed using the codebook: type of sampling (population based or critical population or mixed), gender (proportion women), age, partnership (cohabiting and married vs. not living together), employment status, country where study conducted, response rate (study participants/potential participants), education (percentage of those who had reported no education or elementary education), time since most traumatic war-related event (or if this information was not reported, then time since end of war), exposure to the five most common traumatic experiences, and average number of war-related traumatic events. To be included into the meta-analysis, publications needed to report prevalence rates of depression and/or PTSD. As all but one study reported point prevalences (Alhasnawi et al., 2009), only studies reporting point prevalences were entered. We defined a LMIC according to the World Bank's classification of a country with a gross national income per capita of less than US$12 235 in 2016 (World Bank, 2018).

2.2. Quality assessment

Two raters (the first and second authors) independently rated the quality of the included trials. This was done by developing a scale tailored to the particular requirements for the current review following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (von Elm et al., 2007) and based on previous literature (Sanderson et al., 2007; Wang et al., 2017). Specifically, the scale enabled us to evaluate (1) participants selection procedure, (2) participation rate, (3) psychometric properties of the instrument used to diagnose PTSD or depression in the language in which the study was conducted, (4) psychometric properties of the instrument used to diagnose PTSD or depression in the language in which the instrument was originally developed (given that the instrument was translated from some other language), (5) interviewers' training, and (6) interrater reliability. We classified quality in each domain as low (0), moderate (1), or high (2).

2.3. Statistical analysis

We conducted random effects meta-analyses on prevalence proportions (Barendregt et al., 2013) for depression and PTSD. Analyses were conducted in R 3.4.1 (R Core Team, 2015) with the packages meta v.4.8–4 (Schwarzer et al., 2015; Schwarzer, 2016) and metafor v.2.2–0 (Viechtbauer, 2015; Viechtbauer, 2010). The analyses were conducted on the Freeman-Tukey double arcsine transformed proportions using the inverse variance method (Barendregt et al., 2013; Miller, 1978). Agresti-Coull confidence intervals were constructed for individual studies in the forest plots (Agresti & Coull, 1998). Between-study variance (τ^2) was estimated via Restricted Maximum Likelihood (Schwarzer et al., 2015). Homogeneity of effect sizes was studied via the *Q*-statistic and the I^2-statistic, which indicates the degree of