



Conditional risk for posttraumatic stress disorder in an epidemiological study of a Brazilian urban population



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ABSTRACT

Introduction: Conditional risk for PTSD is the risk of developing PTSD after exposure to traumatic events. This epidemiological study of the general urban population from the two largest cities in Brazil reports exposure to traumatic events; conditional risk for PTSD; and proportion/estimated number of PTSD cases secondary to each type of traumatic event.

Method: Cross-sectional study of general population (15–75 y.o.) from Rio de Janeiro and São Paulo. PTSD was assessed through Composite International Diagnostic Interview 2.1.

Results: Our main findings, from 3744 participants, were: 1) high prevalence of traumatic events (86%), urban violence being the most common; 2) conditional risk for PTSD was 11.1%; 3) women (15.9%) have overall conditional risk 3 times higher than men (5.1%); 4) war-related trauma (67.8%), childhood sexual abuse (49.1%) and adult sexual violence (44.1%) had the highest conditional risks; 5) 35% of PTSD cases (estimated 435,970 individuals) were secondary to sudden/unexpected death of a close person, and 40% secondary to interpersonal violence.

Conclusions: Brazilian urban population is highly exposed to urban violence, and overall conditional risk for PTSD was 11.1%. Violence prevention and enhancement of resilience should be part of public policies, and mental health sequelae of trauma should be better recognized and treated.

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1. Introduction

Posttraumatic stress disorder (PTSD) is a prevalent and disabling psychiatric disorder that can occur after experiencing a traumatic event, defined as “exposure to actual or threatened death, serious injury or sexual violation. The exposure must result from one or more of the following scenarios, in which the individual: directly experiences the traumatic event; witnesses the traumatic event in person; learns that the traumatic event occurred to a close family member or close friend; or experiences first-hand repeated or extreme exposure to aversive details of the traumatic event” (American Psychiatric Association, 2013).

Although exposure to a traumatic event is the *sine qua non* condition for developing PTSD, only part of the individuals exposed to traumatic events will develop the disorder. The conditional risk for PTSD, i.e., the percentage of individuals that develop PTSD after exposure to a traumatic event, is influenced by many factors, including personality characteristics, socioeconomic status, gender and type of traumatic event (Alcantara et al., 2012; Ozer et al., 2003; Brewin et al., 2000).

The prevalence of traumatic events, PTSD and the conditional risk vary widely among studies (Darves-Bornoz et al., 2008; Norris et al., 2003; Kessler et al., 1995; Breslau et al., 1998; Zlotnick et al., 2006; Hepp et al., 2006). Conditional risk for PTSD following any trauma in the general population ranges from 0% (Hepp et al., 2006) to 15% (Norris et al., 2003). Comparison among studies is not always easy due to methodological features, such as different assessment questionnaires and lists of traumatic events. Another explanation

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for such divergent results is the socioeconomic and cultural backgrounds of each population studied (Kaminer et al., 2008; Resnick et al., 1993), which greatly influence the prevalence of traumatic events and conditional risk for PTSD.

Studying the conditional risk for PTSD in the general population is a relevant issue, and can aid in the identification of the characteristics of trauma exposure in different populations providing information on groups that are more vulnerable to developing PTSD. Furthermore, it is useful in the identification of understudied and underfunded areas in the trauma field, in planning public policies, and in providing proper care and possible primary and secondary prevention of PTSD. Despite the increasing internationalization of the scientific literature on PTSD (Figueira et al., 2007), there is still a lack of studies from low and middle income countries (Norris et al., 2003; Zlotnick et al., 2006; Andreoli et al., 2009; Karam et al., 2006).

Many aspects of trauma and PTSD in Brazil remain unknown. The assessment of the exposure to traumatic events and the conditional risk for PTSD in the Brazilian urban population may provide information about the most common traumas, how they affect the population and identify individuals at risk of developing the disorder (Andreoli et al., 2009; Andrade et al., 2012; Ribeiro et al., 2013). The present study reports data from an epidemiological cross-sectional study conducted in the two largest cities in Brazil, regarding the prevalence of exposure to traumatic events, the conditional risk for PTSD according to the type of traumatic event, the proportion of PTSD cases and the number of PTSD cases in the general population secondary to each type of traumatic event.

2. Method

The present study is part of a cross-sectional epidemiological survey performed in São Paulo and Rio de Janeiro, the two largest cities in Brazil. The design of the original survey is described in detail in Andreoli et al. (Andreoli et al., 2009).

2.1. Sampling procedure

In order to draw representative samples of the population aged 15–75 years, a multistage probability to size sampling scheme was performed. In the first stage, the different areas within the two cities were ranked according to their homicide rates, and then grouped into seven strata (1 = less than 10 homicides/100,000 inhabitants; 2 = 10.01 to 20; 3 = 20.01 to 30; 4 = 30.01 to 40; 5 = 40.01 to 50; 6 = 50.01 to 60; and 7 = more than 60 homicides/100,000 inhabitants). In the second stage, all the census sectors within each stratum were mapped. A number of census sectors was randomly selected within each stratum. The number of census sectors varied from 4 to 18 according to the population size within each stratum. In the third stage, 43 households (São Paulo) or 30 households (Rio de Janeiro) were randomly selected within each census sector on the base of odd random numbers. In each selected household all residents aged 15–75 years were enumerated, and one of them was randomly selected based on the Kish's method. Precision calculations indicated that a sample size of around 850 interviews would allow estimation of lifetime prevalence of PTSD of 10%, with a precision of 2%. Due an expected refusal rate of 20%, and in order to identify current PTSD cases to be referred to a case-control study and to a clinical trial, the sample size was established to be of 3000 interviews in São Paulo, and 1500 interviews in Rio de Janeiro. In São Paulo, the three most violent strata were oversampled.

2.2. Data collection

Data collection was carried out between June/2007 and January/2008 in São Paulo, and from October/2007 and July/2008 in Rio de Janeiro. The interviews were carried out in the participants' dwellings. After signing the informed consent, the interviewees were asked to fulfill all the questionnaires. The PTSD section of the Composite International Diagnostic Interview (CIDI) 2.1 (Quintana et al., 2007) and the trauma-related questionnaires were applied only if the interviewee reported at least one traumatic event.

2.3. Assessment of PTSD and exposure to traumatic events

The PTSD diagnosis was assessed through the version 2.1 of Composite International Diagnostic Interview (CIDI 2.1), which is a standardized, fully structured interview for the diagnosis and classification of mental disorder according to the International Classification of Diseases, 10th edition (ICD-10), and the Diagnostic and Statistical Manual of the American Psychiatric Association, 4th edition (DSM-IV). The Brazilian version of CIDI 2.1 has been adapted for the Brazilian social and cultural context (Quintana et al., 2007). Trauma-assessment questionnaires were applied according to the single worst traumatic event referred by the participant. Exposure to traumatic events was assessed through the list of traumatic events of the CIDI 2.1. The list was adapted, and 22 new events were added to the 11 original events. Information on the frequency, intensity, first exposure, and last exposure were also obtained. For the present study, we classified the traumatic events reported by the participants according to a literature-based categorization of traumatic events (Luz et al., 2011).

2.4. Statistical analysis

To correctly determine the prevalence of traumatic events and its 95% confidence interval (CI), we considered the stratified and the conglomerate sampling procedure. These prevalences were estimated for the total sample and also stratified by gender. These analyses were performed with the complex sample analysis module from Stata 12 software (StataCorp, 2011), through the "svy" command.

The conditional risk for PTSD according to the different types of traumatic events was determined considering the worst trauma reported by the subject. We also calculated the proportion of PTSD cases secondary to each traumatic event in the Rio de Janeiro and São Paulo general population, through the following strategy: 1) to estimate the number of PTSD cases in São Paulo and Rio de Janeiro, we applied the PTSD prevalence rates from our sample (Ribeiro et al., 2013) to the respective populations aged 15 to 75 y.o. in 2007 according to the *Instituto Brasileiro de Geografia e Estatística* (IBGE) in both cities; 2) we obtained the proportion of PTSD cases in our sample secondary to each type of traumatic event (referred as the worst trauma by the participants); 3) to estimate the number of PTSD cases secondary to each traumatic event in both cities, we applied the proportions described in step 2) to the total number of PTSD cases obtained in step 1).

2.5. Ethical statement

The Ethics Committee of the Federal University of São Paulo approved the study's protocol (process No. 1369/04), including informed consents, questionnaires, procedures for recruitment and interview of participants, as well as mechanisms for protecting participants' privacy, integrity and rights, in conformity with the principles embodied in the declaration of Helsinki. Respondents were interviewed only after they signed informed consents. When

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