



Research report

Assessment of prevalence and determinants of posttraumatic stress disorder and depression symptoms in adults survivors of earthquake in Haiti after 30 months



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ABSTRACT

Background: On January 12, 2010, a powerful 7.0 magnitude earthquake struck the Republic of Haiti and destroyed Port-au-Prince, the capital and others cities across the country. While some studies have examined the long-term traumatic effects of the seismic event on children and adolescents victims, so far no study has examined the consequences on adults generally. As such, this study aims to investigate the traumatic consequences of the earthquake among adults related to degree of exposure, peritraumatic distress, depressive symptoms and sociodemographic factors two and a half years after. In addition, predictive factors of PTSD and depressive symptoms were also identified.

Methods: From June to July 2012, a total of 1355 adults (660 women) was assessed by means the traumatic exposure questionnaire, the Life Events Checklist subscale, the Peritraumatic Distress Inventory (PDI), the Impact of Event Scale – Revised (IES-R) and the Beck Depression Inventory (BDI), in addition to social demographic characteristics.

Results: The prevalence rates of PTSD and depressive symptoms were 36.75% (498 cases) and 25.98% (352 cases) respectively. The risk factors for PTSD and depressive symptoms were young and old age, female gender, unemployed status and low level of education. The bests predictive variables were peritraumatic distress for PTSD ($\beta = .57, p < .0001$) and for depressive symptoms ($\beta = .21, p < .0001$). The comorbidity between PTSD and depression was 13.36%.

Conclusions: This study found that psychological symptoms are frequent event 30 months after the earthquake. The different mental health care providers, the public health ministry, NGOs working on the ground in Haiti should design programmes in order to aid the psychological wellbeing of the population focussing on youth, older and retired adults, females, people with low levels of education and those who do not work.

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1. Introduction

At 4.52 p.m. on the afternoon of 12 January 2010, a powerful earthquake measuring 7.0 on the Richter scale ripped through the Caribbean country of Haiti, bringing total devastation to a number of towns, including its capital Port-au-Prince. In the 12 days that followed, the United States Geological Survey recorded 52 aftershocks measuring 4.5 or greater. Haiti had been completely unprepared for this powerful earthquake, and it created widespread chaos in the ensuing months, with a high human as well as material toll. Reports from the Haitian government, the

International Organization for Migration (IOM) and the United Nations Development Program (UNDP) put the death toll at approximately 222,000, the number of injured at over 300,000 and the number of people who had lost limbs at between 4000 and 7000. More than 600,000 people were reported as displaced and approximately 1.3 million were reported as homeless and living in makeshift camps in the days following the earthquake (UNDP, 2010; IOM, 2010). In terms of material loss, over 208,000 houses were damaged and more than 105,000 buildings had been completely destroyed. The earthquake had caused damage exceeding the Haitian GDP for 2009 at 7804 billion US dollars.

Studies carried out in the wake of similar natural disasters have shown that populations exposed to earthquakes suffer long-term symptoms of Post-Traumatic Stress Disorder (PTSD), depression and other co-morbid disorders (Goenjian et al., 1994, 2005, 2009, 2011; Kun et al., 2009a, 2009b; Armenian et al., 2000; Naeem

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et al., 2011; Xu and Song, 2011). These studies indicate a prevalence of PTSD, which can vary from 10% to 84.8% depending on the degree of exposure experienced by the populations, their fragility and how long after the event the study was carried out. These and other similar studies – for example, those carried out by Gigantesco et al. (2013) and Dell'Osso et al. (2013) following the earthquake in Aquila in Italy in 2009 and the study by de Dong et al. (2013) following the Sichuan earthquake in China in 2008 – show that the degree of PTSD prevalence varies, in general, according to the scale of human loss from within the population affected, their level of exposure to the earthquake, the degree to which their quality of life has deteriorated and the level of social support they receive following the event. These observations are in line with the meta-analyses and reviews of literature carried out on numerous studies assessing the risk factors of PTSD and other co-morbid disorders, such as depression (Brewin et al., 2000; Ozer et al., 2008; Jolly, 2003). These studies also present natural disasters in general, and earthquakes in particular, as events that can cause major traumatic and depressive disorders in the population affected.

These post-earthquake studies (amongst others) show that the following are also explanatory and predictive PTSD factors: female sex; advanced age; low level of education; socioeconomic problems; poverty; lack of information and social support; level of exposure to trauma and degree of personal involvement; peritraumatic distress; and the level of human and material loss in families as a result of the earthquake (Ali et al., 2012; Brewin et al., 2000; Chan et al., 2012; Dell'Osso et al., 2013; Dong et al., 2013; Dyregrov et al., 2002).

Various studies have shown large positive correlations between the symptoms of peritraumatic distress, PTSD and depression (Nishi et al., 2009; Hagenaaers et al., 2010). The Nishi et al. (2012) studies following the 2011 earthquake and tsunami in Japan showed that the Peritraumatic Distress Inventory (PDI) scores correlated with those of the Impact of Event Scale – Revised (IES-R), which measures PTSD. These studies also showed that the symptoms of peritraumatic distress in the Japanese survivors had an important predictive value of the PTSD symptoms. This was also found to be the case in a remote study carried out by Bui et al. (2012) on the repercussions on foreign populations (France, Canada and America) of the 2011 Japanese earthquake and tsunami, which also showed that peritraumatic distress proved to be one of the best predictors of PTSD. At the same time, however, depression has often been shown to be one of the co-morbid disorders of PTSD (Fan et al., 2011; Goenjian et al., 2009; Jolly, 2003).

The human and material costs of the Haitian earthquake on 12 January 2010 were numerous: approximately 2.5% of the population died during the disaster, the difficulties of mourning in front of the mass burial of unidentified corpses, many children and adolescents were orphaned, many people were instantly left homeless and without shelter, and had to live in makeshift camps. All of these factors (and others besides) put together can cause huge trauma and have severe mental health consequences for the survivors. Hence, studies carried out on children and adolescents following the Haiti earthquake showed the rates of prevalence of PTSD symptoms to be 42.04% after one year and 36.93% after two and a half years (Derivois et al., *in press*; Cénat and Derivois, 2014). They also found that 46.21% of the children and adolescent population had symptoms of depression. At that point, however, the few studies conducted among adults after the earthquake such as Cerdá et al. (2013) have been restricted to some areas and not on all Port-au-Prince, or to evaluate programs of care or among people indirectly exposed to the earthquake, even though they, too, had been shown, in other studies carried out in similar contexts, to be prone to developing symptoms of PTSD, depression and various other disorders.

Given this lack of information on the repercussions of the Haiti earthquake on the mental health of the adult population, we conducted this exploratory study on a sample of adults who were exposed to the earthquake living different districts in Port-au-Prince and from the different social strata represented within that population. This study carried out within the framework of the ANR/RECREAHVI project (ANR-10-HAIT-002: Résilience et Processus Créateur chez les enfants et les adolescents Haïtiens victimes de catastrophes naturelles), aims to determine the prevalence, two and a half years after the earthquake, of PTSD and depression symptoms among survivors aged 18 and over in relation to the levels of traumatic exposure and peritraumatic distress and sociodemographic factors. It also sets out to examine the links existing between the symptoms of peritraumatic distress, PTSD and depression, and to determine the predictor factors of PTSD and depression symptoms among participants. This study complements those carried out on the under 18 s (Cénat and Derivois, 2014; Cénat et al., 2013; Derivois et al., *in press*), where the adults were considered as participating of the psychological and social support to the children and adolescents.

2. Method

2.1. Study design and participants

This study was funded by the Agence Nationale de Recherche in France. The data were collected approximately 30 months after the earthquake by 27 final-year psychology students at the State University of Haiti (one of the partners in the project) over a period of 6 weeks in June and July 2012. These students had 2 days of training owing to the fact that they had been appointed to fill out the questionnaires on the participants' behalf (even though we only used self-administered questionnaires). This was due to the very high level of illiteracy and low level of education in the country and to the fact that it was not culturally acceptable to ask participants if they knew how to read or write. The data collection method was a combination of the door-to-door technique and visits to shelter camps, churches, offices and university and professional training centres in every district of the Haitian capital. All the participants completed the informed consent form once they had been told about the aims of the study, that they had the right to ask questions and that they could withdraw from the study at any time without having to give a reason. The Ethics committee of the University approved the protocol of research and all recruitment and assessment procedures. The Institutional Review Boards of Ministry of Public Health and Population, Ministry of Social Affairs and the State University of Haiti also approved the protocol of this study.

The following criteria for inclusion in the study were applied: (i) participants had to be aged 18 or over; (ii) they had to have been in either Port-au-Prince or one of the outlying municipalities (Carrefour, Delmas, Tabarre, Croix-des-Bouquets, Cité Soleil, Pétiön-Ville) at the time of the earthquake; (iii) they should not have had any psychological treatment. (Very few survivors had had any psychological treatment. It was only in very particular circumstances that the rare few had benefitted, and this was often where undergraduates had been hired by NGOs after the earthquake. We believe these people should be the object of a separate study.); and (iv) they had to have signed the informed consent form.

The sample comprised 1355 adults of whom 660 (48.71%) were female, aged between 18 and 89, with an average age of 31.57 (SD=14.42). This low mean age reflects how young the Haitian population is. The last census in Haiti recorded the mean age as

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