

Post Traumatic Stress Disorder (PTSD) in Post-earthquake Haitian with Traumatic Amputations

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Abstract

- **Background:** Haiti suffered a 7.0 - magnitude earthquake on January 12, 2010. More than 200,000 people were killed, with countless more injured and displaced. Due to injury, many Haitians had to undergo amputations. Exposure to the devastating effects of such massive earthquake and witnessing large numbers of dead and injured is traumatizing to humans and is known to be predictive of psychological disorders.
- **Purpose:** This study was conducted to assess the prevalence of Post Traumatic Stress Disorder (PTSD) after having undergone amputation of a lower extremity, as a result of the earthquake.
- **Participants:** A convenience sample of Haitian (N = 140) was interviewed.
- **Methods:** The PCL-C (PTSD Checklist Civilian version) in Creole was used to measure PTSD.
- **Findings:** A substantial percentage of the participants suffered from PTSD (34.3%). PTSD was higher in women than men (women 38.9%, men 29.4%).
- **Conclusion/Recommendations:** An effort in providing mental health and social services to adults with amputations is of utmost importance in addition to their physical needs related to amputated limb or limbs. A comprehensive program for integrating survivors of the Haitian earthquake in society is of vital and should be a national priority.

Background

- ▶ Located in the American continent in the Caribbean region. Composed of 10 main cities and different Islands .
- ▶ Port au-Prince is the economic capital of Haiti.
- ▶ Divided into costal departments (North West, North, North East, Center, West, South, and the South West) with the latter having the 2010 earthquake's worst damage (USGS,2010).
- ▶ Mountainous country:
 - Susceptible to severe storm, flooding, earthquakes, and periodic droughts.
 - Extensive deforestation, desertification, and soil erosion (Brown, 2010).
 - Environmental conditions: Crucial leading factors to the scarcity of the food, and the limited resources.

Socio demographics

Demographics

➤ In Port au-Prince :

- **86% of population live in slum conditions & poorly built tightly packed buildings (World Bank,2010) .**
- **Lack of safe drinking water and sanitation facilities**
- **One third having access to tap water, and most of the rural houses lacking indoor plumbing (World Bank, 2010; WHO, 2010)**
- **40% of Haitian households: Inadequate shelter and food insecurity (Gage & Hutchinson, 2006)**
- **Rural areas have little access to the basic facilities and services (Raviola, 2013).**
- **Only 10% of the rural population can access electricity & 91% in the metropolitan areas (WHO, 2010).**

Demographics

➤ Education:

- 1:4 Haitian adults or youth cannot read or write
- Half a million children do not attend schools (US Agency for International Development, 2007).
- 72% only primary school education .
- 82% of the primary and secondary school age students attend private schools (Brown, 2010 ; WHO, 2010).

➤ Very high unemployment rates :

- 49% live in the metropolitan areas
- 37% in semi-urban areas
- 36% in rural areas (WHO,2010).

Social and Political Conditions

- Decades of political instability
- Social crisis and corruption
- Isolation
- Mismanagement
- Oppression, human rights abuse, and violence (Raviola et al., 2013 & WHO, 2010)
- Political chaos combined with history of natural disasters crippling effects (Kolbe & Huston, 2006).
- Serious social problems: Sexual violence against women and gang rape (Dévieux et al., 2009)
- ***Political and socioeconomic harsh situations: Migration***
large numbers of Haitians migrate to U.S. & Canada (WHO,2010).

Haitian Health Care System

- 40% of the Haitian people have no access to the basic health services
- Few state-supported hospitals located in cities and larger villages (WHO,2010).
- Inadequate and very weak health infrastructure
- Poorly structured emergency medical system (CDC, 2010)
- Unregulated health provision (Rose et al., 2011)
- ▶ Only 30 % of health facilities are public and support the urban areas.
- ▶ 70% of the services provided in rural areas are provided by NGOs.
- **Mental health services** are centralized in Port-au-Prince with severe understaffing (Rose et al., 2010).
- Little access to the psychosocial support and social services outside the capital.

Health Conditions in Haiti

- Haiti has the highest infant mortality rate in the Americas .
- TB ranks the highest in the Western Hemisphere.
- Have a 32% of chronic children malnutrition; ranked the worst in the Latin American and Caribbean region (US Embassy in Haiti, 2013).
- **Before the earthquake:**
 - Communicable diseases the most leading cause to loss of life years (WHO, 2013)
 - Half of the death causes: HIV/AIDS (prevalence rate of 2.2%), respiratory infections, meningitis, and diarrhea diseases such as cholera, typhoid, & Malaria (Brown, 2010) .

Culture and Mental Health

- Widespread traditional belief in *Vodou* used as a model to explain the causes of physical and mental illness and health issues (Rose et al 2010; Raviola et al., 2012).
 - Life as a source of identity, strength, and safety through linking with each other,
 - Balance between Natural environment, spirits and ancestors: Maintain health,
 - Any disturbance in these components is believed to lead to illness (Raviolal et al., 2012; WHO, 2010).

- Mental illnesses are thought to be attributed to supernatural forces.

Culture and Mental Health

- ▶ Mentally ill individuals: Seen as *victims* of the powerful forces .
- ▶ Family members are reluctant to acknowledge the reality of mental illness
- ▶ Mentally ill individuals face barriers in utilizing available mental health services
- ▶ Hesitancy to access the social services.
- ▶ Consult with the religious individuals, and *Vodou* used.
- ▶ Spirituality is regarded to be the central form of healing.
- ▶ Healers are considered to be co-therapists and trusted more than mental health professionals (Vonarx, 2011; WHO, 2010)

January 12, 2010 Earthquake Catastrophic Consequences

- 7.0 -magnitude earthquake struck Haiti
- Most obvious 15 miles southwest of Port-au-Prince (USGS, 2010).
 - More than three million people directly affected (USGS, 2010).
 - More than 230,000 died and 300,000 were injured (CDC, 2010).
 - 189,000 houses were badly damaged and 105,000 were destroyed .
 - 1.5 million people became homeless and displaced in shelters constituting 15% of the Haitian population (Disaster Emergency Committee, 2013) .
 - Large number of the displaced moved into tents: 100,000 at risk of storms and flooding (Disaster Emergency Committee, 2013).
 - By the end of 2010, there were 380,000 children displaced and living in more than 1300 settlement sites (UNICEF, 2011)
 - Tremendous destruction of most governmental buildings, schools, transportation, and the health infrastructure (CDC, 2010).

2010 Earthquake Physical Health Consequences

- ❑ **Outbreak of communicable diseases: Malaria, Acute Respiratory Infections, and unknown fever.**
 - ❑ **Injuries accounted for 12% of the conditions .**
 - ❑ This outbreak, if not directly caused by the earthquake, has added additional burden on the already weak infrastructures (U.S. Government Work in Haiti, 2012).
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- **Disabilities across the age spectrum from infants to elderly.**
 - **Amputations: 6000 and 8000 people lost digits or limbs (Sontag, 2010).**
 - **Spinal cord and brain injuries**
 - **Complex multiple fractures**
 - **Extensive burns (CDC, 2010)**
 - ***Sepsis & gangrene*. Common causes of medically life -saving recommended *amputation***

2010 Earthquake Mental Health Consequences

- Physical injury have adverse psychological effects on an individual.
- Altered **attitude, mood, and behavior** during the phase of adaptation to a physical injury or loss of body parts
- Research reported prevalence of **depression** after the traumatic event of 7.4% to 28% (Desmond, Mee & Lachim, 2006).
- Amputation resulting from accidental injury may lead to a higher prevalence of PTSD than anticipated surgical amputations due to the **emotional stress** surrounding the accident (Cavanagh et al., 2006).
- The more uncontrollable and unpredictable the traumatic event, the more likelihood to develop PTSD (Margoob & Sheikh, 2006)

Risk Factors for PTSD In Haiti

- Increase the likelihood of Haitians developing PTSD (Sattler et al., 2006):
 - **Pre-disaster psychological factors: Preexisting or concurrent psychiatric comorbidities**
 - **Social substantial stressors (Koopman, Classen, & Spiegel, 1994)**
 - **Family history of mental illness.**
 - **Previous history of exposure to traumatic events.**
 - **Haitians' traumatic experiences and tragic loss of caregivers, family, businesses, houses, & tremendous disruption of lives**
 - **Civil violence after the earthquake**

Risk Factors for PTSD In Haiti

- **PTSD is higher in women after disasters due to several underlying reasons related to stress and trauma in women.**
 - **Family loss, rape, and sexual abuse produce long-lasting emotional turmoil in women**
 - **Limited healing resources and lack of social support (Vernberg, et al.,1996)**
- **Prevalence of PTSD: 20% to 30% of the population affected by a disaster may develop PTSD**
- **In some cases, symptoms occur more than a decade after the event.**
- **Witness of injured and killed bodies: e.g. Rescue personnel have a higher susceptibility for PTSD (Soffer et al., 2011).**

Haiti Earthquake and Prevalence of Amputations

- About 2,000 to 4,000 survivors have lost a limb in the earthquake (Adams, 2010).
- ▶ Earthquake amputations include many children and young adults.
- ▶ Limb loss early in life can predict major depression and other mental disorders (Frank et al., 1984; Singh et al., 2009).

Our Study

➤ Research questions:

1. What is the prevalence of PTSD among Haitian adults with traumatic amputations after the earthquake?
2. What are the mental health needs of the Haitian adults with amputations in the aftermath of the earthquake?
3. What are the suggested culturally sensitive rehabilitation programs for Haitian adults after amputation?

➤ Instruments:

- ▶ The PTSD Checklist (PCL): The most commonly used and validated measure used in diverse populations with diverse traumatic and/or multiple events (Weathers et al., 1993).
- ▶ PCL has 3 different versions based on the event they represent:
 1. **PCL-M measures stressful military experience**
 2. **PCL-C anchors items to civilian stressful experience**
 3. **PCL-S for specific traumatic event**
- ▶ (PCL-C) version in Creole was used to measure PTSD:17-item self-report
- ▶ Translated into the Haitian Creole language to assure linguistic appropriateness & pilot-tested for both linguistic and cultural validity.

Study Measures

- ▶ Although the PCL-C has not been validated in the Haitian Creole language, it has an excellent internal consistency, test–retest reliability and validity in English
- ▶ Correspond to the DSM-IV symptoms: calculated total score and three symptom cluster subscale scores.
- ▶ Respondents indicate, on a scale from 1 (*not at all*), 2 (*a little bit*), 3 (*moderately*), 4 (*quite a bit*) to 5 (*extremely*), the degree to which they have been troubled by a particular symptoms as a consequence of the traumatic event.
- ▶ 3 symptom clusters: ***re-experiencing, avoidance or numbing, and arousal***. The three symptom clusters are categorized in the following order; B item (questions 1-5), C item (questions 6-12), and D item (questions 13-17).
- ▶ Responses to the PCL-C questions must at least include one in the B items, three in the C items, and at least two D items, reflecting either moderately, quite a bit or extremely, or reporting of 3-5 on the PCL-C scale. .

Sample

- ▶ 140 adults who had lower extremity amputation directly related to the earthquake of 2010
- ▶ Between the ages of 18 years to 64 years, with an average age of 34.9 years (SD = 11.97).
- ▶ Females (51.4%) and males (48.6%).
- ▶ Trans-femoral amputation accounted (49.3%), and trans-tibial amputation (48.6%).
- ▶ 88.4% underwent amputation within the first month after the earthquake.

Data Collection

- ▶ Participants recruited from a large non-profit healthcare organization in Port-au-Prince who provided ongoing medical and/or prosthetic care to victims of the 2010 earthquake in two large tents.
- ▶ The study was approved by (IRB).
- ▶ Informed consent was obtained from each participant.
- ▶ Each participant was interviewed in a private area of two large tents (the rehabilitation wing of the clinic).
- ▶ Data was collected over a seven month period.

Data Analysis

- ▶ The Statistical Package for the Social Sciences (SPSS® 20.0) was used for data analysis.
- ▶ McNemar Test was used to determine whether the Haitian participants were positive for PTSD using the 3 subscale method or the 50 points or greater method, after having amputation of the lower extremities related to the earthquake in 2010.
- ▶ Chi square (X^2) was used to determine correlation between gender, age and PTSD.
- ▶ Chi-Square is appropriate to compute the number of participants positive for PTSD combining both the 3 subscale method, and the 50 points or greater method to calculate the total number.

Results

Table (1): Diagnosis for PTSD among different age categories

| Age Categories | Number(n) | % |
|----------------|-----------|-------|
| <=20 | 5 | 45.5% |
| 21 – 30 years | 15 | 28.3% |
| 31 – 40 years | 12 | 44.4% |
| 41 – 50 years | 9 | 32.1% |
| ≥ 51 years | 3 | 17.6% |

_____ $X^2(2, N=140) = 4.74, p = N.S.$

Results

Table 2: PCL individual item scores

| PCL-C Questions | Not at all/A little bit | | Moderately, Quite a bit & Extremely | |
|---|-------------------------|------|-------------------------------------|------|
| | n | % | N | % |
| 1. Repeated, disturbing memories, thoughts, or images of the earthquake? | 74 | 54.0 | 63 | 46.0 |
| 2. Repeated, disturbing <i>dreams</i> of the earthquake? | 102 | 74.5 | 35 | 25.5 |
| 3. Suddenly <i>acting</i> or <i>feeling</i> as if the earthquake was <i>happening again</i> | 96 | 71.1 | 39 | 28.9 |
| 4. Feeling <i>very upset</i> when <i>something reminded</i> you of the earthquake? | 65 | 47.5 | 72 | 52.5 |
| 5. Having <i>physical reactions</i> (e.g. heart pounding, trouble breathing, sweating, etc.) when <i>something reminded</i> the earthquake? | 83 | 61.0 | 53 | 39.0 |
| 6. Avoid <i>thinking about</i> or <i>talking about</i> the earthquake or avoiding <i>having feelings</i> related to it? | 95 | 69.3 | 42 | 30.7 |
| 7. Avoid <i>activities</i> or <i>situations</i> because they <i>remind you</i> of the earthquake? | 89 | 65.0 | 48 | 35.0 |
| 8. Trouble <i>remembering important parts</i> of the day of the earthquake? | 97 | 71.3 | 39 | 28.7 |
| 9. Loss of interest in things that you used to enjoy? | 55 | 40.1 | 82 | 59.9 |

Continued: Table 2 : PCL Individual Item Scores

| PCL-C Questions | Not at all/A little bit | | Moderately, Quite a bit & Extremely | |
|---|-------------------------|------|-------------------------------------|------|
| | n | % | n | % |
| 10. Feeling <i>distant</i> or <i>cut off</i> from other people? | 99 | 72.8 | 37 | 27.2 |
| 11. Feeling <i>emotionally numb</i> or unable to have loving feelings for those close to you? | 74 | 54.8 | 61 | 45.2 |
| 12. Feeling as if your <i>future</i> will somehow be <i>cut short</i> ? | 44 | 32.4 | 92 | 67.6 |
| 13. Trouble falling or staying asleep? | 60 | 44.8 | 74 | 55.2 |
| 14. Feeling irritable of having angry outbursts? | 89 | 65.5 | 47 | 34.5 |
| 15. Having difficulty concentrating? | 90 | 67.7 | 43 | 32.3 |
| 16. Being “ <i>super alert</i> ” or watchful or on guard? | 65 | 48.1 | 70 | 51.9 |
| 17. Feeling <i>jumpy</i> or easily startled? | 69 | 50.3 | 68 | 49.7 |

Discussion

- ❖ **A high prevalence of PTSD in the Haitian population who sustained injuries amputation of the lower extremity.**
- ❖ **In a study conducted in Sichuan Province, China, after the 2008 earthquake, findings indicated that PTSD following a massive earthquake is common in adults (Kun, Han, Chen, & Yao, 2009), affecting between 45% and 56% of the sample.**
- ❖ **The more damage and destruction that victims are exposed to during an earthquake, the more susceptible they are to developing depression and PTSD (Nolen-Hoeksema & Marrow, 1991).**
- ❖ **There was some difference between gender and PTSD diagnosis with a slightly higher number of women diagnosed than with men. similar to finding of previous studies where study. 36.6% of females, and 20.9% of males were diagnosed with PTSD due to experiencing a traumatic event. (Farhood, Dimassi, & Lehtinen, 2006).**

Discussion

- The highest percentage (45.5%) were among the age group 20 years or less
- the lowest (17.6%) among 51 years or older consistent with previous studies
- The findings of this study were similar to other studies in which PTSD diagnosis was higher in younger persons experiencing a traumatic event.
- Cerd´a et al.(2013) conducted a population-based study 2-4 months following the Haiti earthquake, for the prevalence of PTSD and major depressive disorder (MDD). Found that: 90.5% reported at least one relative or close friend injured or killed, 93% saw dead bodies, and 20.9% lost their job post-earthquake also.
- In the same study, low social support was found to increase risk of PTSD among women, while damage of the home increased risk of MDD in males..

Discussion

- ▶ Caldwell and Redeker (2005) reported problems with falling or staying asleep was common among victims of traumatic life experiences and was closely associated with PTSD.
- ▶ Alterations in rapid eye movement (REM) during sleep and associated changes in the intensity of dreams and nightmares, are associated with diagnosis of PTSD (Caldwell and Redeker, 2005).
- ▶ Loud noises made participants feel anxious and scared, with some feeling as though they were back in the midst of the earthquake.
- ▶ Roy's (2006) study among Tsunami victims (2004) reported 17% of the study sample experiencing PTSD symptoms such as panic attacks, nightmare, insomnia, being startled by loud noises, and experience palpitations.

Discussion

- ▶ After suffering a traumatic event, Haitians, who were victims of the earthquake, and lower extremity amputation were prone to flashbacks of their experience when startled by loud noises or disturbances.
- ▶ Participants' reports that the feelings they experienced during the earthquake still haunts them, and never been able to forget that day.
- ▶ When asked if they can still recall what they were doing or feeling on the day of the earthquake, participants reported that they can still remember that day very vividly and the feelings associated with the tragedy.

Study Limitations

- ❑ Small and convenient sample.
- ❑ The PCL-C scale was not validated in the Haitian Creole language, but it was translated for this particular study from English to Creole, and back-translated from Creole to English by one of the authors from the study.
- ❑ However, a number of factors related to the Haitian disaster have been found in the literature to be associated with the PTSD prevalence.
 - ✓ **Social support**
 - ✓ **Marital status,**
 - ✓ **Type of injury,**
 - ✓ **Number of family members killed or injured,**
 - ✓ **Number of homes destroyed**

Recommendations

- ❑ A significant effect of having a prior history of trauma: Research should focus on screening victims of earthquake prior to treatment while targeting improvement of post-earthquake living conditions.
- ❑ Higher prevalence of PTSD among women should be taken in consideration and mental and social services resources should be available for women experiencing PTSD.
- ❑ Victims of trauma diagnosed with PTSD should be further evaluated and treated because reliving the traumatic event can have long term psychological effect among survivors of trauma

Recommendations

- ❑ Rehabilitation programs should be designed to accommodate the needs of the Haitians with amputations who have undergone traumatic and/or surgical amputation that resulted from the earthquake.
- ❑ Treatment should not only be geared towards the physical impairment but also the social, emotional, and psychological aspects of trauma, including;
 - ▶ Work re-entry
 - ▶ Counseling and treatment of PTSD,
 - ▶ Rehabilitation and improved mobility
 - ▶ Complete recovery of patients over time
- ❑ Measures should be taken to develop, implement and evaluate a culturally and linguistically competent care at all levels of mental health services

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