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Research article

# Prevalence and determinants of post-traumatic stress disorder, anxiety and depression symptoms in street children survivors of the 2010 earthquake in Haiti, four years after☆

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ABSTRACT

Working with street children and adolescents who lived through the 2010 earthquake in Port-au-Prince, this paper aims to assess the prevalence of symptoms of PTSD, anxiety and depression in relation to peritraumatic distress, and age, and to explore other risk factors and socio-demographic characteristics, four years after the events. Between March and June 2014, with a sample of 128 children and adolescents (120 boys and 8 girls) aged between 7 and 18, of an average age of 13.88 (SD = 2.15), all living on the streets of Port-au-Prince, we used the following scales: the Trauma Exposure (TE), the Life Events Subscale of the CAPS; the Peritraumatic Distress Inventory (PDI); the Children's Revised Impact of Event Scale (CRIES-13) and the Children Depression Inventory (CDI); (BAI). Our study reveals a high prevalence of PTSD, depression and anxiety among street children. It also demonstrates that this prevalence is lower than that of several other groups of children who were also victims of the 2010 earthquake in Port-au-Prince. Children living in the streets for economic reasons presented a lower prevalence of symptoms of PTSD, anxiety and depression than those who were on the streets as a result of psychological or physical abuse within their own families, in adoptive families or in children's homes. This study demonstrates the importance of care provision for these children in terms of helping them develop coping and resilience strategies. It also stresses the importance of providing them with nonviolent living environments and opportunities to facilitate their return to normality.



## 1. Introduction

At 4.52 pm on January 12, 2010, several cities in the Republic of Haiti, including the capital Port-au-Prince, were struck by the most powerful earthquake to hit this Caribbean country in around 160 years. According to the UN and Haitian state authorities, this major quake left 222,000 dead and over 300,000 injured. In addition, 600,000 people were internally

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displaced within the country and 1.3 million people found themselves in the streets, or living in makeshift tents in camps (IOM, 2010; UNDP, 2010).

Studies carried out among the survivors of similar earthquakes elsewhere in the world have demonstrated that children and adolescents present relatively high prevalence rates of the symptoms of PTSD, depression, anxiety, and other mental health problems in the wake of such disasters (cf. Armenia, Italy, Pakistan, Japan, and China) (Ben-Ezra et al., 2015; Carmassi et al., 2015; Goenjian et al., 2011; Hong & Efferth, 2015). These studies revealed that – especially after natural disasters – between 10.23% and 74% of the survivors presented severe PTSD symptoms.

In Haiti, studies conducted between several months and several years after the events demonstrate that children and adolescents present prevalence rates of PTSD symptoms ranging from 36.95% to 59.1% as well as high levels of depression and anxiety symptoms (Blanc, Bui, Mouchenik, Derivois, & Birmes, 2015; Cénat & Derivois, 2014a, 2014b, 2015; Cénat, Derivois, HéberImat, Eid, & Mouchenik, 2015; Cénat, Eid, Derivois, Hébert, & Clorméus, 2015; Derivois, Cénat, & Mérisier, 2014; Derivois, Mérisier, Cénat, & Castelot, 2014). These studies also highlighted variable prevalence rates depending on the considered sample of children and adolescents. For example, the work of Derivois, Cénat, et al. (2014), Derivois, Mérisier, et al. (2014), and Cénat and Derivois (2015) also pointed to relatively low prevalence rates amongst street children (those already living on the streets before the earthquake) compared with children who had previously lived with their families and those who had attended school.

Various studies have shown the effects of early trauma and poverty on children's health (De Bellis & Zisk, 2014; Luby et al., 2013) and pointed to the need to integrate the multiple (biological, social, emotional, cognitive) dimensions of these injuries (Maj, 2014). In light of these findings, it was important to study the constructs of PTSD among children and adolescents who were already living on the streets during the earthquake, in order to deconstruct and understand the reasons for the low prevalence of PTSD. Studies by the French NGO Aide Médicale Internationale (AMI, 2011) examining the phenomenon of street children in Port-au-Prince divide them into three groups. A first group of children living on the streets of the Haitian capital were brought up there as their parents were themselves homeless. These children were therefore born on the streets and it has been their only habitat. The second group was made up of orphans or children abused by their parents, relatives or strangers in whose homes they worked as domestic servants (these children are known as *rèstavèk*). The NGO's census, in the same 2011 study, revealed that the number of street children rose by 55% between 2006 and 2011, while other studies have shown that physical, sexual and other abuses continue to increase in street children (Bony, 2016). Other children encountered as part of the RECREAHVI project (*Resilience and creative processes among Haitian children and adolescents who are victims of natural catastrophes* HAIT-002), were simply the victims of family conflicts, often either fleeing an abusive stepmother or having been thrown out of the home by her. The third and final group was made up of children who said they were on the streets because a *wanga* (spell) had been cast on them and that they were prevented from returning to their rural areas by vodou spirits.

Conversely, previous similar studies conducted in recent years divided these children into only two main groups:

i. those who were on the street because of the extreme economic and social precariousness of their parents (Bony, 2016; Lubin, 2007);
ii. those who had been victims of psychological, physical or sexual abuse, including bodily harms and wounds, but also suffered from extreme economic and social precariousness (AMI, 2011; Bony, 2016).

Following on from the findings detailing a lower prevalence of PTSD symptoms in very small groups of street children in previous studies, the aim of the present paper is to assess, based on a larger sample, the prevalence of symptoms of PTSD, anxiety and depression in relation to levels of traumatic exposure, the peritraumatic distress and age, as well as exploring the two main reasons for living on the street (violence/abuse and economic difficulties), and other socio-demographic characteristics among the child and adolescent population in question. We also examine the link between these variables and the comorbidity amongst all three. Finally, we highlight the independent and combined effects of a number of variables on PTSD and depression symptoms.

## 2. Methods

### 2.1. Participants and study design

This study was conducted between March and June 2014 amongst a sample of 128 young people (120 boys and 8 girls), aged from 7 to 18, with an average age of 13.88 (SD = 2.15), and living on the streets of Port-au-Prince (Fermathe; Pétion-Ville, Delmas, Carrefour-aéroport City Centre, Champs de Mars, Carrefour feuilles, Carrefour, Santo). It was carried out by four research assistants following a training day in the use of the tools. The questionnaires were all translated into Creole using a method involving both translation and back-translation, with the help of a group of four experts from the Linguistics Faculty of Haiti State University.

We met the young people in our sample either on the streets or in rehabilitation centers, following introductions either from their supervisors or other street children. They came from all ten of the country's regions. The following inclusion criteria were applied: aged between 7 and 18; had lived through the earthquake in Port-au-Prince; were still living on the streets even if they returned to a shelter at night to sleep.

The informed consent forms were signed by the children themselves and by the tutors of those attending the centers. The data were collected in 7 centers for street children. The duration of the interviews averaged 20 min per child. In return, the children enjoyed a cultural activity day with a meal, with 33 children participating for two weeks in discussion groups around painting activities. This course of action was recommended by the Ministry of Social Affairs, which has responsibility for street children, via the IBESR (Institut du Bien être social – *Social Wellbeing Institute 2*), because most of the children were either orphans or wished to avoid any contact with their relatives. The study was carried out based on a protocol approved by the Institutional Review Board of Université Lumière Lyon 2; the Ministry of Public Health and Population, the Ministry of Social Affairs and Haiti State University.

### 2.2. Measures

The variables were all measured using self-administered questionnaires, which contained sociodemographic questions consistent with the aims of the study. The research assistants helped the children through the process by reading out and filling in the questionnaires for them.

*2.2.1. Trauma Exposure.* Trauma exposure was assessed by means of a 19-item dichotomous scale (yes/no). The participants were asked about their experiences of the earthquake and about its impact on their life, on their family and on their wider social circle. Participants were also asked about any injuries or deaths among their family and friends and about the impact of the earthquake on their homes. This scale had been previously used in Haiti, with good reliability (Cénat & Derivois, 2014a, 2014b, 2015).

*2.2.2. Life events checklist subscale.* Traumatic experiences were evaluated using the life events checklist subscale (Gray, Litz, Hsu, & Lombardo, 2004) of the clinician-administered PTSD Scale (Blake et al., 1995). It lists 16 life events that the participant might have experienced (e.g., natural disasters, sexual assault, physical assault). For the purposes of this study, we asked them to pick out life events they had experienced before *and* after the 2010 earthquake. This subscale usually presents good internal consistency (Gray et al., 2004).

*2.2.3. Peritraumatic Distress Inventory (PDI).* The Peritraumatic Distress Inventory (PDI) is a self-assessment questionnaire developed and validated by Brunet et al. (2001). It evaluates the A2 criterion of the DSM IV PTSD diagnosis, i.e., the emotional distress of an individual during the moments immediately following a traumatic experience (e.g., *I felt I was one the verge of losing control of my emotions*) (APA, 2000). It postulates a positive correlation between peritraumatic distress and the development of PTSD. The scale demonstrates sound internal consistency and the alpha coefficients vary between .75 and .82 in Haiti (Cénat & Derivois, 2014). Cronbach's alpha in our sample was .83.

*2.2.4. Children's Revised Impact of Event Scale (CRIES-13).* Inspired by the Impact of Event Scale (Weiss & Marmar, 1997), the CRIES-13 is a PTSD self-assessment questionnaire made up of 13 items (e.g., *Do you think about [the event] even when you don't mean to?*) and widely used with children and adolescents aged 7–17 (Perrin, Meiser-Stedman, & Smith, 2005). The scale has demonstrated strong internal coherence with a general Cronbach's alpha of .80 for the entire scale (Chen, Zhang, Liu, Liu, & Dyregrov, 2012; Perrin et al., 2005; Smith, Perrin, Dyregrov, & Yule, 2003). Perrin et al. (2005) confirmed an effective cut-off score of 30 or above for screening of PTSD. In our sample, Cronbach's alpha was .80.

*2.2.5. Child Depression Inventory (CDI).* Inspired by the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the Child Depression Inventory (Kovacs, 1981, 1985) contains 27 items (e.g., *[] I am sad once in a while; [] I am often sad; [] I am sad all the time*) evaluating several aspects of depression, such as negativity, relationship problems, ineffectiveness, anhedonia, and low self-esteem, It is used with children and adolescents aged between 7 and 17 (Kovacs, 1992) and presents good internal consistency. The CDI is already used in Haiti with a Cronbach's alpha of .77 (Cénat & Derivois, 2015). The same cut-off score of 16 was used in the present study with a Cronbach's alpha of .76 in our sample.

*2.2.6. Beck Anxiety Inventory (BAI).* The BAI is a 21-item scale (e.g., *fear of worst happening*) often used to assess anxiety (Beck, Epstein, Brown, & Steer, 1988). The items are presented with a 4-point response scale from 0 to 3: (not at all; mildly but it did not bother me much; moderately – it was unpleasant at times; and severely – it bothered me a lot). A cut-off score of 36 and above was generally used. Beck et al. (1988) found a strong internal coherence, with a Cronbach's alpha of .93. Jolly, Aruffo, Wherry, and Livingston (1993) observed a Cronbach's alpha of .94 amongst the adolescents. In our sample, Cronbach's alpha was .88.

### 2.3. Statistical analysis

All statistical analysis was carried out using the Statistical Package for Social Science (SPSS) – version 21, for Windows. We carried out *t*-tests in order to examine the difference between age and gender for anxiety, PTSD and depression scores. We conducted Chi-square tests in order to analyze the univariate links between PTSD, depression, and peritraumatic distress and certain sociodemographic characteristics. Bivariate correlation analyses were carried out in order to identify the

**Table 1**
Symptoms of peritraumatic distress, PTSD, anxiety, and depression amongst street children over the clinical cut-off levels and socio-demographical characteristics ($N = 128$).

| | PTSD presence (CRIES) | | Anxiety (BAI) | | Depression (CDI) | |
|---|---|---|---|---|---|---|
| | *n* (%) | $X^2$ | *n* (%) | $X^2$ | *n* (%) | $X^2$ |
| Total | 19 (14.84) | | 17 (13.28) | | 38 (29.69) | |
| Have been in domesticity | | 13.37*** | | 6.02* | | 2.34 |
| Yes | 12 (22.64) | | 10 (18.86) | | 17 (32.07) | |
| No | 7 (9.33) | | 7 (9.33) | | 21 (28.00) | |
| Age | | 4.76* | | .01 | | |
| 7–13 years | 5 (9.26) | | 7 (12.96) | | 17 (31.48) | |
| 14–18 years | 14 (18.92) | | 10 (13.51) | | 21 (28.37) | |
| Reason for living in the street | | 10.11*** | | .002 | | 8.12** |
| Violence | 14 (26.92) | | 7 (13.46) | | 18 (34.61) | |
| Economic | 5 (6.58) | | 10 (13.16) | | 20 (26.31) | |
| Shelter | | 9.73*** | | 4.51* | | 13.16* |
| Streets | 8 (36.36) | | 6 (27.27) | | 10 (45.45) | |
| Center | 11 (10.38) | | 11 (10.38) | | 28 (26.41) | |

* $p < .05$.
** $p < .01$.
*** $p < .001$.

links between the various variables (traumatic experience, traumatic exposure, peritraumatic distress, anxiety, PTSD, and depression). Multivariate regression analysis was conducted in order to study the weight of different variables on PTSD and depression. Finally, we conducted a chi-square analysis in order to ascertain the significance of the comorbidity between peritraumatic distress, PTSD, and depression.

## 3. Results

Almost all the children and adolescents in our sample claimed to have undergone at least one traumatic experience before (100%) and after (99.22%) the earthquake. Of the 128 respondents in our sample; 25.78% reported having had between 1 and 5 such experiences; 57.81% cited 6–10 events; and 16.41% said they had experienced 10 traumatic events before the earthquake. After the catastrophe, 23.44% had experienced between 1 and 5 traumatic experiences; 46.87% reported between 6 and 10; and 28.91% had undergone more than 10 since the earthquake.

In terms of traumatic exposure, 23.44% said they had been in an enclosed space during the earthquake; 32.03% reported the death of at least one family member during the earthquake; and 35.16% reported having friends who had died or disappeared. 13.28% reported having been injured themselves. In terms of exposure to multiple traumatic factors during the earthquake itself, 76.56% reported having undergone three or more such experiences.

With regard to peritraumatic symptoms related to the earthquake, the average score of the *Peritraumatic Distress Inventory* was 17.99 (SD = 9.29): 16.84 (SD = 8.71) for those who were living on the streets for economic reasons and 24.53 (SD = 10.02) for those who had experienced abuse at home or at the home of those to whom they have been sent as domestic servants, $t(126) = 3.47$, $p < .001$. As for PTSD symptoms, the average score on the *Child Revised Impact of Event Scale* was 17.04 (SD = 11.92): 13.40 (SD = 8.24) for those who were living on the streets for economic reasons and 37.89 (SD = 7.49) for those who had experienced abuse at home or in homes where they worked at as domestic servants, $t(126) = 12.11$, $p < .00001$. The average score on the *Beck Anxiety Inventory* is 20.34 (SD = 13.27): was 18.05 (SD = 12.30) for those who were living on the streets for economic reasons, rising to 33.47 (SD = 11.03), for those who had experienced violence where they lived, $t(126) = 5.11$, $p < .0001$. Regarding depressive symptoms, the average score of the *Child Depression Inventory* was 12.98 (SD = 5.45): for those who were living on the streets for economic reasons and 14.84 (SD = 6.85) for those who ere on the streets because of abuse, $t(126) = 2.18$, $p = .11$.

The prevalence of severe symptoms of PTSD was 14.94%, as against 13.28% for symptoms of anxiety and 29.69% for symptoms of depression. Table 1 presents the entire range of prevalence of symptoms of PTSD, anxiety and depression categorized by sociodemographic data and the traumatic life experience of these young people.

The results presented in Table 2 show significant correlation coefficients between the symptoms of anxiety and PTSD ($r = .63$, $p < .01$). They also reveal a positive link between age and symptoms of PTSD ($r = .19$, $p < .05$) and between age and symptoms of depression ($r = 21$, $p < .05$). The other correlation coefficients (whether significant or not) are presented in Table 2.

In the multivariate regression PTSD prediction (Table 3), peritraumatic distress ($\beta = .39$, $p < .0001$), the suffering of physical abuse ($\beta = .27$, $p < .0001$) and the fact of having been in domestic service ($\beta = .19$, $p < .0001$) represented the largest variances. In general, the model explains 33% of the variance. The model evaluating the weight of variables predicting the symptoms of depression explains 29% of the variance, while the traumatic experiences represent the greatest variance ($\beta = .26$, $p < .0001$). The prediction model of anxiety explained 38% of the variance showing that peritraumatic distress was the best predictor of anxiety symptoms ($\beta = .38$, $p < .0001$).

**Table 2**
Correlation matrix between all variables ($N = 128$).

| | Age | $TE_1$ | $TE_2$ | TE | PDI | BAI | CRIES |
|---|---|---|---|---|---|---|---|
| TEbefore | .09 | | | | | | |
| TEafter | .07 | .63** | | | | | |
| TE | .17 | .08 | .11 | | | | |
| PDI | .06 | .09 | .14 | .42** | | | |
| BAI | -.03 | .23* | .21* | .26** | .52** | | |
| CRIES | .19* | .11 | .08 | .29** | .43** | .63** | |
| CDI | .21* | .12 | .27** | .03 | .20* | .19* | .21* |

* $p < .05$.
** $p < .01$.
$TE_{before}$: traumatic life events before the earthquake; $TE_{after}$: traumatic life events after the earthquake; TE: the earthquake Traumatic Exposure; PDI: Peritraumatic Distress Inventory; BAI: Beck Anxiety Inventory; CRIES: Children's Revised Impact of Event Scale; CDI: Child Depression Inventory.

**Table 3**
Results of multivariate regression analyses predicting PTSD and depressive symptoms ($N = 128$).

| | $F$ | $p$ | $R^2$ | $\beta$ | $t$ | $p$ |
|---|---|---|---|---|---|---|
| *PTSD symptoms* | 64.29 | <.0001 | .33 | | | |
| Age | | | | .14 | 2.71 | .003 |
| Traumatic life events before the earthquake | | | | .089 | .92 | .36 |
| Traumatic life events after the earthquake | | | | -.05 | -.46 | .64 |
| Traumatic Exposure to the earthquake | | | | .07 | .83 | .41 |
| Peritraumatic Distress | | | | .39 | 13.12 | <.0001 |
| Endured violence | | | | .27 | 3.59 | <.0001 |
| Have been in domesticity | | | | .19 | 2.47 | <.0001 |
| Family violence experienced | | | | .06 | .70 | .48 |
| Street violence | | | | -.01 | -.09 | .92 |
| *Depressive symptoms* | 58.12 | <.0001 | .29 | | | |
| Age | | | | .12 | 3.15 | .003 |
| Traumatic life events before the earthquake | | | | -.18 | -4.56 | <.0001 |
| Traumatic life events after the earthquake | | | | .26 | 2.28 | <.0001 |
| Traumatic Exposure to the earthquake | | | | .005 | .05 | .96 |
| Peritraumatic Distress | | | | .13 | 3.67 | .003 |
| Endured violence | | | | -.06 | -.68 | .50 |
| Have been in domesticity | | | | -.06 | -.62 | .53 |
| Family violence experienced | | | | .12 | 3.11 | .002 |
| Street violence | | | | -.09 | -.99 | .32 |
| *Anxiety symptoms* | 75.20 | <.0001 | .38 | | | |
| Age | | | | -.11 | -1.28 | .20 |
| Traumatic life events before the earthquake | | | | .14 | 1.31 | .19 |
| Traumatic life events after the earthquake | | | | .01 | .08 | .93 |
| Traumatic Exposure to the earthquake | | | | .03 | .33 | .74 |
| Peritraumatic Distress | | | | .48 | 4.93 | <.0001 |
| Endured violence | | | | .25 | 2.69 | <.01 |
| Have been in domesticity | | | | .07 | .77 | .44 |
| Family violence experienced | | | | -.07 | -.74 | .46 |
| Street violence | | | | .01 | .12 | .91 |

Finally, the results show that of the 128 young people in our sample, the comorbidity of the symptoms of PTSD and depression is 7.81%; 5.47% between the symptoms of PTSD and anxiety; and 7.03% between the symptoms of anxiety and depression. The comorbidity between all three is 3.12%.

## 4. Discussion

The main aim of this paper was to study the prevalence and predictive factors of symptoms of PTSD, anxiety and depression linked to the experience of the January 2010 earthquake among a sample of children and adolescents living on the streets of Port-au-Prince, four years after the event.

Our first finding is that children and adolescents on the streets present high prevalence rates of PTSD, depression and anxiety. The results of the multivariate regression revealed that the fact of having suffered physical and psychological abuse within the family and on the streets, the experience of having worked as a domestic servant, and peritraumatic distress were all important factors in explaining the symptoms of PTSD, depression and anxiety. Above all, however, this study confirms that street children present prevalence rates that are lower than other groups of children who were also victims of the earthquake. In fact, the various studies carried out after the event – whether among children who had received psychological care (Blanc et al., 2015), the general population who had received no care of any kind (Cénat, Eid, et al., 2015; Cénat, Derivois, et al., 2015), or in specific districts or municipalities of the Haitian capital (Derivois & Cénat, 2014) – reveal

that street children generally present a lower prevalence of PTSD, depression and anxiety. Moreover, contrary to the findings of previous studies, in which children tended to present a higher prevalence of symptoms of PTSD and especially depression than adults, the results of the present paper show that street children present a *lower* prevalence than adults (Cénat & Derivois, 2014a, 2014b; Cerdá et al., 2013).

However, there are no strong data to explain the lower prevalence of symptoms of PTSD, depression and anxiety among children and adolescents living on the streets, Studies carried out among street children nevertheless reveal that, in order to survive, they are obliged to develop violent traits and strategies to deal with hardship, bullying, violence, injuries and aggression from older children and street gangs (Crombach & Elbert, 2014; Hai, 2014; Nsengiyumva, 2010; Wagner, Lyimo, & Lwendo, 2012).

As demonstrated in the studies by Crombach and Elbert (2014), children who successfully develop specific strategies to cope with street violence present lower PTSD prevalence rates. The strategies they develop to cope with cumulative traumas and vulnerability on the streets, where violence is the rule, seem to have prepared them to cope with the traumas of the earthquake. Furthermore, it could even be hypothesized that the fact that the earthquake drove around 1.3 million people in Port-au- Prince onto the streets has normalized and legitimized the situation of the street children. Paradoxically, the streets have come to be seen as a protective and safe living space because, at the moment of the disaster, it was far better to be there rather than trapped under concrete or buried among the rubble. Qualitative studies on these street children in Haiti have revealed a resilient tendency to rebuild lives on the streets (Karray et al., 2015; Karray, Derivois, Brolles, & Buzaglo, 2016).

Another significant finding is the fact that children living on the streets for economic reasons present a lower prevalence of symptoms of PTSD, anxiety and depression than those living on the streets because of psychological or physical abuse experienced within their own family, or in their adoptive families, or in rehabilitation centers. Studies have shown that children and adolescents who are victims of non-intentional traumas present lower prevalence of symptoms of PTSD and other mental health issues than those who have been victims of intentional traumas (Alisic et al., 2014; Santiago et al., 2013). While economic problems can result in traumas such as chronic hunger or deprivation, they remain non-intentional traumas. By contrast, the physical and psychological abuse suffered by these children at the hands of their family or their adoptive families constitute intentional traumas and as such, destroy strong bonds of attachment. They undermine the children's self-regard as human beings and may thus lead to mental health problems such as PTSD, depression, anxiety, and so on, in the long term (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010; Mills et al., 2013).

While this is the first study to address the prevalence and predictors of symptoms of PTSD, depression, and anxiety linked to the 2010 earthquake specifically among the street children of Haiti, it nevertheless has certain limitations.

First, the study's cross-sectional design did not enable us to study the causal links and specific risk factors associated with symptoms of PTSD, depression, and anxiety. Studies based on longitudinal designs would potentially be more beneficial in understanding the life experience of these street children – between the violence and the bullying – as well as their family history and the subsequent development of mental health problems.

The second limitation of this study is the presence of a low number of girls (under 10%), which prevented us from making gender-based analyses. While we could have devoted more energy to recruiting girls, the areas where we came across girls in the streets of Port-au-Prince were considered to be dangerous, and we therefore decided not to put our researchers at risk. However, it should be acknowledged that there are fewer girls living in the streets of Haiti – according to the most recent census only 11% of street children are girls (AMI, 2011).

Finally, the absence of studies conducted amongst this specific segment of the population before and after the earthquake made it impossible to compare the results of this study, however interesting it would be to view the differences over time and within the various groups studied.

Despite these limitations, this study makes a significant contribution to understanding the lower prevalence rates of symptoms of PTSD, depression, and anxiety amongst street children and adolescents on the one hand, and the need for care provision for street children on the other. The difference in the variables studied – based on whether the children are on the streets for economic reasons or because of abuse – shows the importance of providing care to these children either before their arrival on the streets, while they might still be in abusive families, or as soon as they arrive on the streets. This can help us anticipate their habituation to traumas which may arise from pseudo-resilience or even from pathological resilience (Derivois, 2012).

This study also sheds new light on the higher prevalence of mental health problems amongst children and adolescents with a roof over their heads. It thus paves the way for further specific studies of the coping and resiliency strategies used by street children in their battle with adversity. As other research shows, children and adolescents who have been victims of natural disasters and interpersonal traumas, if they find the necessary resources, can build a process of resilience (Ungar, 2014; Weems & Graham, 2014). This in turn should lead to the introduction of rehabilitation programs based on their social and ecological environment and their real needs (Ungar, 2014; Weems & Overstreet, 2008) so that young people may be better equipped to deal with trauma.

## 5. Conflict of interest

All authors declare the absence of any conflict of interest.

Informed consent was obtained from all individual participants included in the study

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