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Epidemio-Clinical Profile of Psychotrauma in Military Victims of Terrorists Attacks in Benin in December 2021

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Abstract

Introduction: In December 2021, Beninese soldiers were victims of armed terrorist attacks. This study aims to determine the psychological impact of the events experienced on the victims in order to better prevent post-traumatic stress disorder. **Materials and methods:** This is a descriptive cross-sectional study conducted from December 13 to 14, 2021, *i.e.* 12 days after the oldest event and 4 days after the most recent. The experience of the event was assessed with the Peritraumatic Distress Inventory and the Peritraumatic Dissociation Experiences Questionnaire. Symptoms experienced in the hours and days after the event were assessed with the Revised Event Impact Scale. **Results:** 36 soldiers were included out of the 38 survivors, *i.e.* 94.73%. They were 51.43% victims of the night assault, 37.14% of the ambush on patrol and 11.43% of the explosion of vehicle on mine, all male. The average age was 31 years with extremes of 25 and 49 years. The 25 - 30 year olds predominated, 52.78%. 100% of soldiers had significant peritraumatic dissociation, of which 94.44% also had significant peritraumatic distress. 100% of the soldiers had manifestations of intrusion, 89% of manifestations of avoidance and 83% of manifestations of hyperexcitation. 88.89% had an index for acute stress including 100% of victims of night assault and vehicle explosion on mine. **Conclusion:** This study shows a high prevalence of peritraumatic reactions, recognized factors favoring post-traumatic stress disorder, and the interest of their evaluation for medical and psychological help adapted to the victims.

Keywords

Psychotrauma, Peritraumatic Dissociation, Peritraumatic Distress, Terrorist Attacks, Military

1. Introduction

Over the past decade or so, the jihadist terrorist threat has set the Sahel ablaze, and is now spilling over into the northern part of the coastal countries of West Africa, extending into Benin, Côte d'Ivoire, and to a lesser extent Togo, Ghana, Senegal and Guinea [1]. This politico-military reality is likely to generate, among other consequences, real mental health problems. Terrorism is a phenomenon of war in peacetime, striking at random victims and upsetting the psychic and functional balance of the individual subjected to it [2]. Deployment-related post-traumatic stress disorder and related mental health problems represent a major challenge for military and veteran treatment facilities worldwide. The burden associated with these problems, including human suffering, lost productivity and disability, is considerable [3].

In early December 2021, troops from the Beninese army were confronted with the first armed attacks by terrorist groups in the country's history. These attacks caused loss of life and left some survivors with serious after-effects. A mission was organized for the victims, to provide them with care and psychological support. However, the clinician cannot ignore or neglect the existence of the first clinical pictures that immediately follow exposure to a potentially traumatic event. And the existence of "traumatic" features of the immediate experience, in particular signs of dissociation and peritraumatic distress, should alert the clinician to the possibility of an unfavorable evolution, towards post-traumatic stress disorder [4].

In order to improve the future management of people exposed to distressing events, it is important to monitor people with intense peritraumatic reactions, high levels of anxiety and depression, and to measure reactions [5]. Given that Benin's military troops have very rarely been confronted with situations of war or armed aggression, and given the scarcity of data on the mental health of military personnel after combat in Africa, this mission took the opportunity to carry out a study with the aim of determining the psychological impact of the events experienced by the victims, in order to prevent post-traumatic stress disorder (PTSD).

2. Materials and Methods

2.1. Type of Study

This was a descriptive cross-sectional study carried out from December 13 to 14, 2021, in the garrisons to which the victims belonged. It was carried out after the somatic care required by the state of health of certain servicemen following the

event.

2.2. Study Population

We carried out a census of all servicemen who were victims of the terrorist attacks of December 2021.

2.3. Inclusion Criteria

All military personnel present at the sites of the various terrorist attacks who had given their informed consent to take part in the study were included, with the exception of those whose health conditions were critical and prevented them from taking part.

2.4. Data Collection

The soldiers were individually asked to fill in a form concerning socio-demographic data (age, sex, level of education) and antecedents (psychiatric pathology, use of psychoactive substances, previous confrontation with a psychotraumatic event), and we had them take the following three self-administered tests:

- *Peritraumatic Distress Inventory (PDI)*

This is the French version of the Peritraumatic Distress Inventory. PDI is a 13-item self-report scale designed to determine a person's emotional distress reactions at the time of a traumatic event, and in the minutes and hours following. Each of the 13 items is rated from 0 (not at all true) to 4 (extremely true). The total score is the sum of all items. A score of 15 or above indicates significant distress [6].

- *Peritraumatic Dissociative Experiences Questionnaire (PDEQ)*

The French version of the Peritraumatic Dissociative Experiences Questionnaire is a 10-item test that measures experiences of dissociation during a traumatic event, as well as in the few hours following it. Each item is scored from 1 (not at all true) to 5 (extremely true). The total score is the sum of all items. A score of 15 or above indicates significant dissociation [7].

Responses to these two tests can be used to determine the intensity of the peritraumatic response.

- *Impact of Event Scale-revised (IES-R), French version*

The oldest and most widely used self-reported questionnaire, this scale is designed to measure subjective post-traumatic stress after a traumatic situation. It currently comprises 22 items. The patient is asked to read the various items, specifying that they are a list of difficulties that people sometimes experience following a stressful event and to rate how upset he or she has been by these difficulties over the past 7 days. Items are rated on a 5-point frequency scale, ranging from 0 (not at all) to 4 (extremely), via 1 (a little), 2 (moderately) and 3 (very much). The scoring distinguishes 3 subscales: an avoidance subscale (items 5, 7, 8, 11, 12, 13, 17, 22), a memory intrusion subscale (items 1, 2, 3, 6, 9, 14, 16 and 20) and a hyperarousal subscale (items 4, 10, 15, 18, 19 and 21). Scores are ob-

tained by summing the responses for each item. Scores on the intrusion symptoms scale range from 0 to 35, those on the avoidance symptoms scale from 0 to 40, and those on the hyperactivity scale from 0 to 35. The authors currently choose to take a total score of 22 as in favor of significant acute stress symptoms, and a score of 36 as suggesting the presence of post-traumatic stress disorder. This scale is generally used with adult populations such as war veterans, assault victims, road accident victims and natural disaster survivors. In particular, this scale is used before treatment, at the end of treatment and at reassessment [8].

2.5. Data Analysis

The data collected were entered and analyzed using Epi info software version 7.2.5.0.

Standard statistical measures were used to describe the total population. The chi² test was used to compare data. Links between values were considered statistically significant at the 0.05 probability level.

2.6. Ethical Considerations

All the victims included had given their informed verbal consent. They were informed individually of the procedures for data collection, storage and use, as well as what was expected from the measurements. The results were presented to them at the end. The different types of care available and how to access them were explained, together with the contact details of the various army health facilities providing such care. The study was approved by the Central Direction of the Health Service of the Armed Forces of Benin.

3. Results

3.1. Events and Exhibitions

Three terrorist attacks were perpetrated over a period of 11 days against Beninese military personnel, and consisted of a night assault on a military position, an ambush on a motorized patrol and a vehicle on patrol that was blown up by a mine. 40 military personnel were involved and 95% (n = 38) survived, including 13.58% (n = 5) with serious injuries (see **Table 1**).

3.2. Study Population

Each soldier in our study was a victim of only one of the three events. Of the 38

Table 1. Distribution of military personnel by type of terrorist attack and consequences.

Type of attack	Attacked staff (n = 40)	Survivors (n = 38)	Serious injuries (n = 5)
Night assault	23	21	04
Ambush	13	13	00
Mine explosion	04	04	01

soldiers who survived the attacks, 36 (94.73%) were included, 2 being in a worrying clinical situation that prevented them from taking part (see **Figure 1**).

There were 19 (52.78%) victims of the night assault, 13 (38.11%) of the patrol ambush and 4 (11.11%) of the mine explosion.

3.3. Socio-Demographic Characteristics

All the soldiers deployed ($n = 36$) in the areas affected by the attacks were exclusively male. The average age was 31 ± 5.3 years, with extremes of 25 and 49 years. The 25 - 30 age group represented 52.78% ($n = 19$) of the population. The majority, 66.67% ($n = 24$), had at least high school level (see **Table 2**).

3.4. Background

None of the soldiers reported a psychiatric history. 2.78% ($n = 1$) reported having been involved in a road accident 6 years ago, and subsequently suffering a

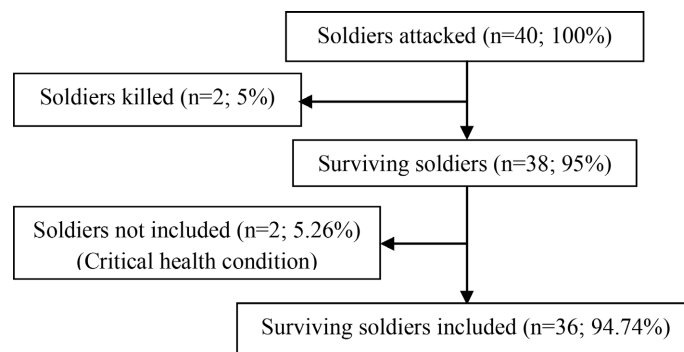


Figure 1. Sampling flow diagram.

Table 2. Distribution of military personnel by socio-demographic data.

	Size	Percent (%)
Sex		
Male	36	100
Age		
Mean \pm standard deviation (median)	31 \pm 5.3 years (30 years)	
[Minimum; Maximum]	[25 years; 49 years]	
Age group (years)		
[25 - 30]	19	52.78
[31 - 40]	15	41.67
[41 - 50]	02	05.56
Education level		
College	12	33.33
High school	21	58.34
University	03	08.33

very intense fear that caused them to avoid motorcycle travel for about a year, before gradually returning to normal. 19.44% (n = 7) reported habitual use of psychoactive substances. These included alcohol, tobacco and cannabis, consumed either alone, alternately or in combination. However, all of them said they had not yet felt the desire or need to use them since the events.

3.5. Injuries

Five (13.88%) suffered physical injuries as a result of the attacks, including four victims of the assault who suffered gunshot wounds to the right arm, right elbow, abdomen requiring reconstructive surgery and leg requiring amputation, and one victim of the vehicle explosion who suffered a torn eardrum and 3 fractured cervical vertebrae.

3.6. Experience of the Event and Traumatic Response

- *Feelings of death, horror, dread or helplessness*

According to the responses obtained on the PDI, frank statements (“very true” and “extremely true”) were granted to 97.21% (n = 35) for the item “I thought I was going to die”, 41.66% (n = 15) for “I felt unable to do anything” and 25% (n = 9) for “I was horrified by what I had seen” (see **Table 3**).

- *Peritraumatic distress and peritraumatic dissociation*

All the servicemen (n = 36) had significant peritraumatic dissociation (PDEQ score \geq 15), of whom 94.44% (n = 34) also had significant peritraumatic distress (PDI score \geq 15). Only 5.56% (n = 2) had no significant peritraumatic distress (see **Table 4**).

3.7. Symptoms Experienced since the Event

88.89% (n = 32) of victims had an acute stress score (IES R score \geq 22 within one month of the event). These included 100% (n = 19) of night assault victims, 69.23% (n = 9) of ambush victims and 100% (n = 4) of IED victims (see **Table 5**).

The mean scores for intrusion, avoidance and hyperarousal were 15.40, 12.13

Table 3. Distribution of victims according to PDI items relating to the experience of death, horror and feelings of powerlessness.

Item	Quotation					P
	Not true	A little true	Rather true	Very true	Extremely true	
“I thought I was going to die.”	00.00% (n = 0)	00.00% (n = 0)	02.77% (n = 1)	19.44% (n = 7)	77.77% (n = 28)	0.0001
“I felt unable to do anything.”	19.44% (n = 7)	22.22% (n = 8)	16.66% (n = 6)	19.44% (n = 7)	22.22% (n = 8)	0.1285
“I was horrified by what I had seen.”	63.88% (n = 23)	00.00% (n = 0)	11.11% (n = 4)	25.00% (n = 9)	00.00% (n = 0)	1.0000

Table 4. Distribution of military personnel by event and PDEQ and PDI scores.

Event	PDI (n = 36)		PDEQ (n = 36)
	Score < 15 (n = 2)	Score ≥ 15 (n = 34)	Score ≥ 15 (n = 36)
Night assault	0.00% (n = 0)	52.78% (n = 19)	52.78% (n = 19)
Ambush	5.56% (n = 2)	30.55% (n = 11)	36.11% (n = 13)
Mine explosion	0.00% (n = 0)	11.11% (n = 04)	11.11% (n = 04)

Table 5. Distribution of military personnel by event and IES-R score.

Event	IES-R score			Total (n = 36)
	<22 (n = 4)	22 à 35 (n = 12)	≥36 (n = 20)	
Night assault	00.00% (n = 0)	19.44% (n = 7)	33.33% (n = 12)	52.78% (n = 19)
Ambush	11.11% (n = 4)	13.88% (n = 5)	11.11% (n = 4)	36.11% (n = 13)
Mine explosion	00.00% (n = 0)	00.00% (n = 0)	11.11% (n = 4)	11.11% (n = 4)

Table 6. Mean score for clinical manifestations.

Score	Clinical manifestations		
	Intrusion (n = 36)	Evitement (n = 32)	Hyperexcitation (n = 30)
Minimum	1	0	0
Below-average (n; %)	13 (36.12%)	14 (43.75%)	15 (50%)
Mean score	15.4	12.13	12.9
Above-average (n; %)	23 (63.88%)	18 (56.25%)	15 (50%)
Maximum	29	25	22

and 12.9 respectively. All the victims (n = 36) had intrusion manifestations, of which 64% (n = 23) had an above-average intrusion score, 89% (n = 32) had avoidance manifestations, of which 56% (n = 18) had an above-average avoidance score, and 83% (n = 30) had hyperarousal manifestations, of which 50% (n = 15) had an above-average hyperarousal score (see **Table 6**).

3.8. Onset of PTSD Symptoms

The majority of victims, 86.12% (n = 31), reported the onset of PTSD manifestations on the day of the event itself, including irritability and angry outbursts, exaggerated startle response and hypervigilance. 13.88% (n = 5) saw the onset of PTSD on the day after the event, including recurrent, intrusive and distressing memories of the event, sleep disturbances with distressing dreams, difficulty concentrating and intense feelings of distress when recalling the event.

Furthermore, our study found no correlation between the variables (age, edu-

cation, history, injuries, type of attack) and the clinical manifestations (intrusion, avoidance, hyperexcitability) on the one hand, and between these variables and the different scores on the scales used (PDI, PDEQ, IES-R) on the other.

4. Discussion

This is the first study to assess psychological trauma in Beninese military personnel, who were also victims of the first terrorist attacks in Benin. It has the merit of taking stock of initial data, notably peritraumatic responses and clinical manifestations, which could serve as a benchmark for assessing evolving clinical data in victims. It also reduces the scarcity of data on psychotrauma in the African military.

The population in our study had the particularity of being military victims of terrorist attacks, and the study had been carried out in the post-immediate period, less than 15 days for the three events. As we were unable to find data in the literature on an identical population for comparison purposes, we will use the data we did find, relating either to civilian victims of armed conflicts or attacks, or to military personnel returning from overseas missions or war veterans, or to rescuers, law enforcement and security officers involved in the post-immediate management of attacks. Moreover, these studies were carried out at least 3 months after the traumatic event.

This was an exclusively male population, mostly young, with no pre-traumatic factors and no serious physical injuries for the majority in the aftermath of the event, who presented a high proportion of peritraumatic reactions, including peritraumatic dissociation and distress, and an acute stress state, the manifestations of which appeared within the first two days after the traumatic event for all of them.

The observed male exclusivity does not correspond to the reality of the Beninese army, which, on the contrary, has female personnel in all components and categories [9] [10]. However, for multiple societal, strategic or convenience reasons, an army may voluntarily exclude women from combat situations [11]. Dutra *et al.* in a study of military women deployed to Iraq and exposed to combat experiences, showed that 11% of them tested positive for PTSD [12].

Only one soldier had a history of an accident involving a psychotraumatic event with an avoidance syndrome. As previous experience of other potentially traumatic events increases the risk of developing a psychotraumatic syndrome [13], there is a risk of recurrence and intensification of symptoms in response to the current traumatic event.

Despite the fact that 19.44% had reported habitual use of psychoactive substances, none of the military victims had used a psychoactive substance since the event. However, an IMPACTS study carried out 6 and 18 months after the attacks found an increase in alcohol, tobacco and cannabis use among 29% of those directly threatened [14]. This lack of consumption could be linked to the fact that they were kept under medical surveillance, or because they were in the post-immediate phase, described by Louis Crocq as corresponding either to a

return to the normal state, or to the setting up of new defenses, where those of stress had proved inoperative [15].

Only 13.88% of survivors had sustained serious physical injuries as a result of the attacks. Physical injuries sustained during a traumatic event are peritraumatic risk and prognostic factors [16]. Evelyne Josse explains that, once healed, people injured during a traumatic event suffer more psychotraumatic symptoms than those who escaped unharmed, and reports epidemiological studies showing that 15% to 30.7% of the seriously injured present manifest disorders, compared with 3.4% to 10.5% of those involved unharmed. The more severe, extensive, unsightly and visible the injuries, the more disabling and incapacitating they are, such as amputations [13]. These victims of serious bodily injury are also likely to experience an intensification and chronicization of symptoms.

Victims expressed feelings of arbitrariness, horror, dread, powerlessness and, above all, death. These different elements of the lived experience, although subjective, qualify the traumatic nature of the event for the subject and constitute factors that could impact prognosis and evolution. Although they were military men, trained for war, for a moment, control was lost, death was no longer implicit and its experience became real, the illusion of mastery over one's own destiny was shattered and the personal myth of invulnerability collapsed [17]. This was the first time the country, with soldiers accustomed to peacetime, had faced such a terrorist experience. This state of affairs is probably not without influence on the traumatic response. Militarily speaking, an assault is a sudden, swift armed attack, while an ambush is a stratagem consisting of watching for the enemy from a concealed position, in order to attack by surprise. Every soldier is familiar with these tactics which, like the mine trap, have a single aim: to kill and decimate the enemy camp. Experiencing these events means going beyond a simple threat to life, and coming face to face with the reality of death, a circumstance that is at the root of the disruption of the psychic apparatus that results in psychic trauma. The general stampede caused by such tactics induces a sense of abandonment at the individual level, breaking down the sense of belonging and cohesion customary in the army. However, Vincent *et al.* also explain that it is not a high level of exposure that influences post-traumatic stress disorder, but the presence of peritraumatic reactions [5]. And our study found a high prevalence of peritraumatic dissociation (100%), peritraumatic distress (94.44%) and acute stress (88.89%). These prevalences in our study population are higher than the values reported by Duagani Masika *et al.* who found 39% of subjects with peritraumatic dissociation in a study of 120 civilians exposed to armed conflict in the Democratic Republic of Congo [18]. But they are close to those reported in a study about 2627 victims of the bombing of the American embassy in Nairobi, where over 60% reported signs of peritraumatic psychological distress. Peritraumatic dissociation and peritraumatic distress have been identified as important risk factors for the development of PTSD [19]. A recent review of the literature highlights that the intensity of peritraumatic distress is likely to promote the

onset of PTSD and more severe PTSD symptoms [20]. The intensity of peritraumatic distress predicts the occurrence of post-traumatic symptoms among assault victims [21] [22]. However, Breh & Seidler show in their results that peritraumatic dissociation is a moderate risk factor for PTSD [23].

In all victims, manifestations of post-traumatic stress disorder began within the first 48 hours after the event. A similar result was reported in a study of the 1995 Oklahoma City bombing, which showed that of the 34% of subjects presenting with PTSD within six months of the event, 76% presented with symptomatic manifestations of PTSD on the first day of the disaster, and 90% within a week [24].

These results therefore suggest that all the servicemen in our study were at risk of subsequently developing post-traumatic stress disorder, and deserved special attention in their follow-up.

Our study has limitations in that, in general, although assessments were made only 12 days after the earliest event, subjects with post-traumatic stress disorder in particular find it difficult to give accurate descriptions of past emotional states. Restrictive factors that play a role in this context are related to memory failure, attribution and malingering. Also, the small size of our sample does not allow for sufficient statistical power. This probably explains the total absence of correlation between variables, clinical manifestations and scales. Despite these limitations, the results of our work are interesting, as it is pioneering work that opens up prospects for further research.

5. Conclusion

This study has shown that the terrorist attacks caused significant emotional and cognitive mobilization during and immediately after the event for the vast majority of the soldiers involved. It enabled us to identify the presence of risk factors for the development of post-traumatic stress in the medium to long term, and to organize formal care for the victims, with appropriate psychosocial support. Long-term follow-up of the soldiers included in this study would be of definite interest.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

SURVEY FORM

Date
Age
Sex	-Male -Female
Education level	-Primary -Middle school -High school -University
Rank
Which attack were you involved in?	-Night assault -Ambush -Mine explosion
Date of the attack on your team
Were you injured on this occasion?	-Yes -No
if so, what are your injuries	
Do you have any comrades who died during the attack?	-Yes -No
What illnesses have you already suffered from in your life?	
Do you usually drink alcohol?	-Yes -No
if so, at what frequency	
Are you accustomed to smoking cigarettes or other psychoactive substances?	-Yes -No
if so, which ones and how often	

Impact of Event Scale—Revised

Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you during the past seven days with respect to xxx, how much you distressed or bothered by these difficulties

		0	1	2	3	4
R1	Any reminder brought back feelings about it	Not at all	A little bit	Moderately	Quit a bit	Extremely
R2	I had trouble staying asleep					
R3	Other things kept making me think about it					
R4	I felt irritable and angry					
R5	I avoided letting myself get upset when I thought about it or was reminded of it					
R6	I thought about it when I didn't mean to					

Continued

R7	I felt as if it hadn't happened or wasn't real
R8	I stayed away from reminders about it
R9	Pictures about it popped into my mind
R10	I was jumpy and easily startled
R11	I tried not to think about it
R12	I was aware that I still had a lot of feelings about it, but I didn't deal with them
R13	My feelings about it were kind of numb
R14	I found myself acting or feeling like I was back at that time
R15	I had trouble falling asleep
R16	I had waves of strong feelings about it
R17	I tried to remove it from my memory
R18	I had trouble concentrating
R19	Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart
R20	I had dreams about it
R21	I felt watchful and on guard
R22	I tried not to talk about it

Peritraumatic Dissociative Experiences Questionnaire

Please complete the items below by circling the choice that best describes your experiences and reactions during the attack and immediately afterwards. If an item does not apply to your experience, please circle "not at all true".

	1	2	3	4	5
	Not at all true	Slightly true	Some-what true	Very true	Extremely true
Q1	I had moments of losing track of what was going on—I "blanked out" or "spaced out" or in some way felt that I was not part of what was going on				
Q2	I found that I was on "automatic pilot"—I ended up doing things that I later realized I hadn't actively decided to do.				
Q3	My sense of time changed—things seemed to be happening in slow motion.				
Q4	What was happening seemed unreal to me, like I was in a dream or watching a movie or play.				
Q5	I felt as though I were a spectator watching what was happening to me, as if I were floating above the scene or observing it as an outsider.				
Q6	There were moments when my sense of my own body seemed distorted or changed. I felt disconnected from my own body, or that it was unusually large or small.				

Continued

- Q7 I felt as though things that were actually happening to others were happening to me—like I was being trapped when I really wasn't.
- Q8 I was surprised to find out afterward that a lot of things had happened at the time that I was not aware of, especially things I ordinarily would have noticed.
- Q9 I felt confused; that is, there were moments when I had difficulty making sense of what was happening.
- Q10 I felt disoriented, that is, there were moments when I felt uncertain about where I was or what time it was.

Total

Peritraumatic Distress Inventory

Please complete the items below by circling the choice that best describes your experiences and reactions during the attack and immediately afterwards. If an item does not apply to your experience, please circle "not at all true".

	0	1	2	3	4
	Not at all true	Slightly true	Some-what true	Very true	Extremely true
P1	I felt helpless to do more				
P2	I felt sadness and grief				
P3	I felt frustrated or angry that I could not do more				
P4	I felt afraid for my own safety				
P5	I felt guilt that more was not done.				
P6	I felt ashamed of my emotional reactions				
P7	I felt worried about the safety of others				
P8	I had the feeling I was about to lose control of my emotions				
P9	I had difficulty controlling my bowel and bladder				
P10	I was horrified by what I saw				
P11	I had physical reactions like sweating, shaking, and my heart pounding				
P12	I felt I might pass out				
P13	I thought I might die				
	Total				