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Psychotraumatic Interventions and Post-Traumatic Stress Disorder among the Lomé Firefighters

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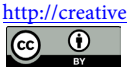

Abstract

Aim: This study aimed to assess the quality of the psychological experience of mobile emergency teams, in particular firefighters (FF) in Togo and to identify the psychotraumatic interventions (PI) they face. **Method:** This was a cross-sectional, descriptive, statistical analysis and discourse content analysis study on the PIs of the Lomé FFs. **Results:** PIs were found to be: road accidents; defenestrations; self-immolation murders; bloody and non-bloody suicides; well interventions with or without drowning; extensive burns; and paediatric procedures. Adults aged 25 to 45 were at a percentage of 69.1% and with a sex ratio of 7.1. More than half of the respondents (53%) had PTSD. **Conclusion:** More than half of the respondents had PTSD, however, coping strategies were not explored, suggesting the need for further research.

Keywords

Firefighters, Psychotraumatic Interventions (PI), Togo

1. Introduction

Exposure to a traumatic event, whatever its nature, constitutes an entity in its own right, invisible and difficult to describe, responsible for Post-Traumatic Stress Disorder (PTSD). Many situations such as armed conflicts, natural disasters, accidents and murders can be at the origin of this psychological disorder in the various actors involved. Most of these events are handled by mobile emergency teams, in particular the Emergency Medical Aid Services (SAMU), the

Mobile Emergency and Resuscitation Structures (SMUR) and the Fire Brigade (FF), which are on the front line. Thus, they face these psychotraumatic situations on a daily basis, where the spectacle of mutilated or disfigured corpses, the death of a child, or the suffering and distress of patients, contribute to the dramatic experience of these interventions [1]. In developing countries, where the health system is sometimes precarious and poorly organized, mobile emergency teams are often represented by civilian or military first responders, rather than by SAMU or SMUR. These first responders are often poorly equipped, poorly trained and, above all, lack information about the difficult aspects of their daily work tasks. In Togo, the mobile emergency and casualty collection teams are mainly made up of members of the Togolese Armed Forces (FAT). They focus their attention mainly on physical trauma, but so far, no scientific study has seemed to focus on the psychological state of these personnel [2] [3] [4] [5]. In addition, we have observed a number of FF seeking psychiatric and neurology and general practice for anxiety disorders. It is because of these findings that this study was initiated, focusing on one of the serious forms of psychological suffering, namely PTSD in these personnel. In order to assess the quality of the psychological experience of FFs in the face of their daily interventions, this work was undertaken with the general objective of identifying psychotraumatic interventions with the mobile teams for the collection of the wounded in Lomé. More specifically, it is a question of: identifying the characteristics of situations likely to be psychotraumatic interventions; reveal the experience of PTSD in FF.

2. Framework, Materials and Method of Study

2.1. Study Framework

The present study was carried out at the Lomé Fire Brigade (CSP), which has two centres in Lomé: the main fire station in the centre of Lomé and the second fire and rescue company inside the FAT General Staff compound.

2.2. Study Material and Method

Type and period of study

This was a cross-sectional, descriptive, statistical analysis and discourse content analysis study on the IPs of the Lomé FFs. This study was conducted from June 1 to 14, 2021.

Study population

Included in this series are: firefighters who are regularly integrated into the FAT workforce; 18 years of age and older; regardless of gender; with full professional activity in the current year; with or without specific basic training; who has given free and informed verbal consent.

Team drivers were not included in this study.

All persons with a psychiatric history were excluded from this work.

Data collection

The research team consisted of two (02) interns and a psychiatrist who ac-

tively participated in the analysis of the content of the discourse. Statistical data collection was carried out using a data collection sheet including the Post Traumatic Stress Questionnaire (PTSQ) specially designed for this purpose. As for the collection of data from the focus group, it was carried out using a general interview guide aimed at referencing the main themes to be addressed and the questions to be asked to the actors. Similarly, the analysis of the content of the speeches has been undertaken.

After developing a statistical data collection sheet and an interview guide, the research team proceeded to several groups within the study population, depending on their availability at the work site. This was a random survey technique, implemented in such a way that the forms were filled out individually. All the parameters of the survey sheet were explained and the team was available during the filling.

Following the completion of the survey forms, we formed small groups in order to carry out a focus group, based on the interview guide developed. In a semi-directive approach, this interview guide was not used in a systematic or linear manner, but proved useful in guiding and pacing the discussions.

Data processing and analysis

Statistical analysis was performed using epi info version 7 software. Qualitative variables were described by frequencies or percentages. The quantitative variables were described by position and dispersion parameters: mean and standard deviation when the distribution is normal. A bivariate analysis revealed statistically significant differences between the variables using Pearson's Chi^2 test at the significance level of 5%. Thus, a statistically significant difference was considered when $p < 0.05$.

A technique that divides content analysis methods into three categories [6] has been used: logico-semantic methods, logico-aesthetic or formal methods, and semantic and structural analysis methods. In addition, we used the technique of psycholinguistic analysis based on the SPLIT-10 diagnostic scale [7], which significantly discriminates between traumatic and non-traumatic narratives [8]. The 10 items explored are: death, spatiotemporal context, strangeness, metaphor, evocation of body parts, verbs of body movements or body position, generic pronouns, perception, repetition, and incomplete words or utterances [9]. A score above 5/10 was suggestive of PTSD. The analysis of the data began as soon as the focus group was transcribed, taking into account both the verbal and the non-verbal. Initially, a repeated and in-depth reading of the writings was carried out in a vertical manner. Then, the analysis of the focus groups was done in a cross-sectional way. The participants' words were cut, confronted, compared and labelled. The verbatims were then classified into categories, grouped according to thematic ideas. To reinforce the internal validity of the results, double coding was carried out. Thus, the psychiatrist and an intern independently analysed the data before comparing them.

Ethical considerations

The verbal consent of the surveyed agents was obtained after a clear explana-

tion of the study, and their anonymity was respected. The results of the study have been forwarded to the competent authorities. This study was funded by the researchers, there was no conflict of interest.

3. Results

3.1. Overall Results

A total of 85 people were surveyed and 81 subjects were selected for this series, including 60 in the main rescue barracks and 21 in the 2nd rescue company.

3.2. Socio-Demographic Data in General

The distribution of FF into 3 age groups according to the WHO criteria [10] was: adolescents 3 (3.7%); adults aged 25 to 45 years 56 (69.1%) and adults aged 46 to 64 years 22 (27.2%). The male gender was represented by 71 or 87.6% and a sex ratio of M/F was therefore 7.1. The length of employment of respondents between 0 and 5 years, 6 to 10 years and 11 to 15 years was 20 (24.7%), 45 (55.5%) and 16 (19.8%) respectively. Rank-and-file soldiers were 49 (60.5%); non-commissioned officers 31 (38.3%) and officers 1 (1.2%).

3.3. General Clinical Data

Subjects meeting the criteria of the Diagnostic and Statistical Manual, Fifth Revision (DSM-V) for PTSD according to the PTSQ

Individuals with complete PTSD with the presence of all 4 criteria were representing 53% of the total sample (Table 1).

PTSD intensity and different types of PIs

The average intensity of PTSD manifested by the workers was 48.9 (standard deviation 12.5). The maximum intensity was 71 and the minimum intensity was 22.

All the participants (100%) had already carried out an intervention related to road accidents, which they found to be the most traumatic in 26% of cases, as explained in Table 2.

Table 1. Distribution of respondents meeting DSM-V criteria for PTSD according to the PTSQ.

	Frequency (n = 81)	Percentage (%)
Criterion A: Trauma with Feelings of Horror and Fear	81	100
Criterion B: Recurrence Symptoms	51	62.9
Criterion C: Avoidance Symptoms	48	0.5
Criterion D: Symptoms of hypervigilance	45	55.5
Duration of symptom progression of at least 1 month	62	76.5
Presence of all 4 criteria with a duration of evolution of at least 1 month (complete PTSD)	43	53.0

3.4. Socio-Demographic Data of Participants with PTSD

The onset of PTSD by age range, gender, duration of function, and rank resulted in a Chi^2 test of 1.14, 1.31, 1.18, and 1.52, respectively, followed by p-values of 0.76, 0.25, 0.91, and 0.46 (Table 3).

Table 2. Distribution of respondents according to the intervention considered to be the most traumatic.

	IP		Stronger IP in intensity	
	Frequency (n = 81)	Percentage (%)	Frequency (n = 81)	Percentage (%)
Highway Accident	81	100	20	24.7
Intervention in wells with or without drowning	70	86.4	15	18.4
Paediatric Intervention	62	76.5	10	12.3
Extensive burn	58	71.6	4	5.0
Murder by self-immolation	52	64.1	10	12.3
Defenestration	40	49.3	4	5.0
Suicides	40	49.3	8	10.0
Indifferent	-	-	10	12.3

Table 3. Distribution of FF with PTSD by age group, gender, length of function and rank.

	TSPT		No PTSD		Chi^2	p
	n = 43	%	n = 38	%		
Age range						
Adolescents [15 - 25 years]	1	2.3	2	5.3		
Adults [25 - 45 years]	29	67.5	27	71.1	1.14	0.76
Adults [46 - 64 years]	13	30.2	9	23.6		
Gender						
Masculine	36	83.7	35	92.1	1.31	0.25
Feminine	7	16.3	3	7.9		
Duration at the position						
0 - 5 years	13	30.3	10	26.4		
6 - 10 years old	7	16.3	6	15.8	1.18	0.91
11 - 15 years old	23	53.4	22	57.8		
Rank of the FF						
Rank and File Soldiers	25	58.1	24	63.2		
Non-commissioned officers	18	41.9	13	34.2	1.52	0.46
Officers	0	0.0	1	2.6		

3.5. Content of Clinical Interviews

Interventions that can lead to psychotrauma

For 7 of the respondents, paediatric interventions could be responsible for a feeling of horror and helplessness: "the child was crying in the well and it reminded me of my baby's cries"; "A little child like that, dying for nothing... That's why I never let my wife take my child on a motorcycle."

Paediatric interventions: the traumatic nature of these interventions stemmed from the image of "innocence" and "purity" that the workers had of the children. Some responders feel sorry for the victims. "I wanted to cry when I saw this innocent baby burned by hot water." Workers created an unconscious emotional relationship between themselves and the victims by identifying with the victims. "The child was crying in the well and it reminded me of my baby's screams." "A little child like that, dying a for nothing... That's why I never let my wife take my child on a motorcycle."

For the 81 respondents, violent and bloody interventions in everyday life such as road accidents, interventions in wells, defenestrations, suicides and murders by self-immolation were sometimes associated with a feeling of horror and unreality: "I had a chill in my back when I pulled a lifeless body from a well... At the same time, I tell myself that man is nothing"; "When a truck is involved in an intervention, it's often unpleasant with limbs scattered all over the place."

Effect of Traumatic Interventions on the Psyche

For 71 of the workers, the course of the traumatic interventions seemed to be etched on their memories: "I remember the smallest details as if it were yesterday, it comes back to me every time, even in dreams." "I wonder if I could forget all this in retirement to live in peace...". The encounter with death arose in the psyche of the speakers, sometimes leading to a state of stupefaction or even temporary stupor: "I was standing like a robot without being able to move"; "I felt like I was lost for a few seconds", "It feels like we're living in another world".

Proportion of SPLIT-10 language markers in FFs

The FFs with PTSD according to the SPLIT-10 were 43 (53%) with a score greater than 5/10.

FFs referring to body movement verbs in their speeches were in the minority with a 49.3% percentage as "I was walking slowly without knowing where I was going". All of them in their speeches emphasized perceptions and sensations: "every time I eat, I smell blood" as shown in Table 4.

4. Discussion

4.1. Criticisms of the Method

This study probably did not take into account all the firefighters in Lomé. Some officers were forced to interrupt the investigation to manage ongoing operations.

This study retains all its originality due to the use of the PTSQ, the reference tool in epidemiological studies of this type, making paraclinical assessments negligible. In addition, the SPLIT-10 scale used more subtly assesses PTSD in

Table 4. Distribution of respondents according to expressions of feelings about psychological trauma.

	Frequency (n = 81)	Percentage (%)
Death	67	82.7
Spatiotemporal context	40	49.3
Strangeness-Unreality	62	76.5
Metaphor or Comparison	58	71.6
Body Part	52	64.1
Body Movement Verb	40	49.3
Generic pronoun	58	71.6
Perceptions-Sensations	81	100
Repetition of pronouns or determiners	52	64.1
Incomplete word or statement	70	86.4

Possibility for an individual to express in several words his or her experience of trauma.

psycholinguistic semiology. This is the first study of its kind in Togo. It is important to note that Lomé is home to nearly a third of the Togolese population and that the CSP is the most present, constant and organized unit of casualty pickers on the ground. The results were particularly relevant, with a high rate of FFs with PTSD found.

4.2. Clinical Data

Responders who meet the DSM-V criteria for PTSD

This study found that 53% of the responders had complete PTSD, with the presence of all 4 DSM-V criteria. This frequency was much higher than that observed in France in 2014 among SMUR responders, studied by Laurent A *et al.*, where the rate was only 1.5% with an average intensity of 24.5 (standard deviation 9.4) [11], as well as in 2 army units, studied by Vallet D [12], where the rate was 1.7%. These low rates have also been observed in other studies in France, such as those conducted by Vermeiren J [13] in 2001 (2.3%) and De Soir E in 2003 (1.9%) [14]. The difference between this series and the others could be explained by several factors. First of all, there is the lack of medical and psychological follow-up in the barracks, the neglect of the phenomenon by the authorities that consider the military to be "tough" and the lack of knowledge of the disease by the various actors. In addition, SMUR personnel in the West are better prepared for these situations due to their training, unlike the firefighters in Lomé who have only received first aid training.

PTSD intensity

The mean intensity of PTSD was 48.9, with a margin of error of ±12.5. This figure is very close to the estimated pathological cut-off score of 51 [15]. These values are high compared to Laurent A's study [11] which is 24.59 (standard de-

viation 9.42). This difference can be explained by the fact that the disease is little known by stakeholders and caregivers, which can lead to its evolution towards a more serious form when it takes hold. In addition, the absence of medical-psychological follow-up in the barracks may explain the high average intensity in the middle of this series compared to France.

Different types of PI and the most traumatic from a psychological point of view

Based on the results, 100% of FFs experienced a traumatic intervention associated with feelings of fear, horror or helplessness. This percentage was higher than that of a study by Laurent A [11] which identified 77% of SMUR agents as having experienced the same situation. In 2001, a study by Tillaux A *et al.* [16] revealed that 38% of SMUR agents had already been confronted with this situation. This high rate of workers who have experienced a traumatic intervention can be explained in this series by the reduced number of staff within the SPC. Thus, the probability that each agent would be confronted with a trauma intervention was very high and then there were very few of them. Moreover, in the context of a developing country, where the population has little confidence in firefighters, who are often treated as "doctors after death", they are only called upon in situations deemed serious and potentially psychologically traumatic.

The most traumatic intervention was road accidents, reported by 26% of responders. However, the study conducted by Laurent A [11] showed that 40.1% of SMUR responders considered road accidents to be the most traumatic interventions. We also find, following the studies by Girault-Lidvan N [17], Dyregrov A [18], Lucille A [19] and Vallet A [12], that the most exceptional interventions, such as defenestrations, were not the most traumatic for the responders. In contrast to this, it is rather during "routine" interventions, such as road accidents or interventions in wells with or without drowning, that professionals express their traumatic experience. In these cases, the responder expects a familiar situation and suddenly finds himself confronted with horror. The brutality and unpredictability of the situation do not allow the responder to predict what will happen, thus making him more vulnerable to the traumatic impact so the short circuit of non-integration into the psyche of the event occurs.

4.3. Analysis and Interpretation of the Content of the Interviews

The analysis of the focus group data allowed us to retain 2 themes: the nature of psychotraumatic interventions and their psychopathological repercussions on the responders.

Nature of PIs

The interventions judged to be traumatic were divided into 2 groups:

The violent and bloody interventions of everyday life identified in this study include road accidents, interventions in wells with or without drowning, defenestrations, extensive burns, bloody or non-bloody suicides, as well as murders by self-immolation. A study carried out by Laurent A [11] also identified PIs

among SMUR workers.

Paediatric interventions were also a source of trauma for responders. The traumatic nature of these interventions stemmed from the responders' image of children as "innocent" and "pure." Some workers felt pity for the victims and created an unconscious emotional relationship between themselves and the children by identifying with the children. These specific aspects of paediatric interventions as psychotraumatic factors are essential to take into account in the context of prevention and psychological support for firefighters who are exposed to these delicate situations during their missions.

Linguistic markers of SPLIT-10 in FF

A total of 53 FFs were identified as having PTSD according to SPLIT-10. This number corresponds to the number of FFs with PTSD according to the PTSQ. This concordance highlights the reliability of the SPLIT-10 scale in the diagnosis of PTSD, as noted in the study by Auxemery Y *et al.* [9], which focused on the identification of linguistic markers of psychotrauma in spoken language. All firefighters, *i.e.* 100%, emphasized perceptions and sensations in their speeches about PIs. This highlighting of perceptions and sensations contrasts with the results of a study conducted by Auxemery Y *et al.* [9], which noted that the most predominant item among French soldiers returning from Afghanistan and suffering from PTSD was a speech with metaphors, in a proportion of 95%. This difference between the two studies can be explained by the fact that the nature of the psychotraumatic events to which the FFs and the French soldiers were exposed differs greatly. FFs interventions often involve emergencies, accidents and disasters, where they were directly confronted with the distress and suffering of victims. Their speeches therefore focus more on the sensory perceptions, emotions felt and physical sensations they experienced during these traumatic events. On the other hand, French soldiers returning from Afghanistan were confronted with a warlike environment, with widespread and permanent experiences of violence and extreme danger with occasional outbursts. Their discourse with metaphors can reflect the need to put into words traumatic experiences that are particularly complex and difficult to express directly.

5. Conclusions

The aim of this cross-sectional study with descriptive and analytical aims whose data were collected from the FFs of Lomé, was to assess the quality of their psychological experience in the face of daily interventions.

This series had made it possible to identify as PIs: road accidents; defenestrations; self-immolation killings; bloody and non-bloody suicides; interventions in wells with or without drowning; extensive burns; and paediatric interventions. More than half of the respondents had PTSD. Men, adults aged 25 to 45 and non-commissioned soldiers were more affected.

The coping strategies put in place by some responders to avoid the disease could not be highlighted. These coping strategies are important in the preventive

psychotherapeutic approach to PTSD in this professional group, hence the need for further research.

Conflicts of Interest

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

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