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Article

Traumatic Events, Psychopathology, and Post-Traumatic Stress Disorder in the General Community and First Responders: Presence of Symptoms and Associated Factors

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Abstract

Most individuals experience at least one traumatic event during their lives, which can lead to the development of psychopathological symptoms and Post-Traumatic Stress Disorder. First responders (e.g., police officers, firefighters, emergency medical professionals) are exposed to traumatic events daily, making them more vulnerable to developing these symptoms. Using an online questionnaire, we aimed to compare self-reported exposure to traumatic events and the presence of psychopathological and PTSD symptoms between a sample from the general community (n=137) and first responders (n=672) residing in Portugal. We also aimed to identify factors associated with the development of PTSD symptoms. Results showed that, although first responders reported higher exposure to traumatic events, there were no significant differences in PTSD symptoms between first responders and the general community; However, general psychopathological symptoms (anxiety and depression) were higher in the general community than for first responders. Symptoms of anxiety, depression, obsessive-compulsive tendencies, hostility, paranoid ideation, psychoticism, and personally experienced traumatic events emerged as predictors of PTSD symptoms, while demographic variables showed no significant predictive value. We discussed the potential influence of factors like terror management theory, training and education, selection, the 'hero lifestyle,' and the 'police culture' on the results and explored directions for future research.

Keywords: PTSD; traumatic events; first responders; general community; psychopathology

1. Introduction

While 70% of the general population experiences at least one traumatic event in their lifetime [1–3], professionals in high-risk occupations are routinely exposed to potentially traumatic situations [4–6]. Traumatic events include exposure to armed conflicts, violent deaths, and traffic accidents with imminent personal risk of severe injury or death, etc. [7,8]. In professions such as firefighting, law enforcement, and medical emergency sectors, repeated exposure to traumatic events can negatively impact physical and mental health, with increased risk of depression, anxiety [9], and Post-Traumatic Stress Disorder (PTSD) [10–12]. Previous research shows that prevalence rates of PTSD symptoms vary between general populations and high-risk occupations [4]. Some studies indicate discrepant incidence rates of PTSD symptoms ranging from 1% [13] to 5–9% [14]. 6.8% of the general population

in the USA experience PTSD symptoms once in their lives [15]. In countries with armed conflicts, rates are as high as 37% [16]. Studies with first responder professionals from high-risk occupations indicate that PTSD symptoms’ prevalence rates vary per sector. Specifically, 20% to 30% in emergency medical sectors [17,18], 14.2% of UK police officers [19], 11% of ambulance workers [11], and 13.5% of war veterans [20] reported PTSD symptoms. Still, on studies that examine the psychopathological vulnerability for PTSD in the general population and in first responders, one study with 2,606 individuals of the general European Portuguese population found a 7.87% prevalence rate of PTSD symptoms. Moreover, the study highlighted significant gender discrepancies, namely 11.4% in women and 4.8% in men [21]. Regarding first responders, one study involving military personnel (army, navy, air force, and GNR) who served in Kosovo, Afghanistan, Lebanon, and Timor in 2011, reported a 22.5% prevalence rate of PTSD symptoms [22]. Another study identified that 39% of a sample of Portuguese colonial war veterans exhibited PTSD symptoms [23]. Although most people experience at least one traumatic event in their lifetime, not everyone develops PTSD symptoms [24,25]. After a traumatic event, some individuals temporarily experience similar symptoms to PTSD, but the symptoms last only a couple of days or weeks [24,26]. This evidence suggests that multiple etiological pathways to PTSD exist in trauma exposure and highlights the urgency to better understand and accurately identify risk and protective factors in the development of PTSD symptoms upon exposure to traumatic events [26–28]. Although there is existing literature on the prevalence of PTSD among first responders and the general population, the present study is innovative due to its large sample size, as well as the integration of multiple variables, including traumatic events, PTSD symptoms, and psychopathological symptoms (as measured by BSI dimensions). Therefore in this study, we aimed to: (1) Verifying the number of traumatic events in general community and first responders; (2) ex-amine the relationship between trauma types, PTSD symptoms (SPSSV criteria), and psychological symptoms (BSI) in first responders and general community; (3) compare the presence of psychopathological symptoms between both groups; (4) compare PTSD symptoms between both groups; and, (5) identify and compare associated factors with PTSD symptoms. This study may contribute to the existing literature, helping identify protective and risk factors in the development of PTSD amid exposure to traumatic events, and inform policy makers of the urgency for prevention, detection, and treatment in this area.

2. Materials and Methods

This study used a cross-sectional, quantitative approach with a self-report questionnaire administered online via the Qualtrics platform.

2.1. Participants

1503 responses were registered, from which 694 were excluded for not completing the questionnaire. The final sample included 809 participants aged between 18 and 74 years, with a mean age of 43.68 years (SD = 9.04). Of these, 137 were from the general community, and 672 were first responders (firefighters, police officers, and emergency medical professionals). Most participants were male (n = 670, 77.9%), married (n = 430, 51.1%), Portuguese (n = 800, 98.9%), and had completed secondary education (12th grade). Most participants reported having three people in their household (n = 249, 30.8%) and a monthly household income between 1,000 and 1,500 euros (n = 206, 25.5%). Most participants also reported one dependent (n = 283, 35%), no health problems (n = 624, 77.1%), and not taking any medication (n = 525, 64.9%). About 102 (15.2%) of the first responders and 18 (13.1%) of the general community met criteria for PTSD. Additional socio-demographic information is provided in Table 1.

Table 1. Sociodemographic Characteristics.

Groups	n (%) or M (SD)
First responders	672 (83.1)

	General community	137 (16.9)
Age	First responders	44.00 (8.62)
	General community	43.78 (10.87)
Gender	First responders	
	Male	585 (87.1)
	Female	87 (12.9)
	General community	
	Male	45 (32.8)
Marital status	Female	92 (67.2)
	Single	173 (21.4)
	Married	413 (51.1)
	Cohabitating	138 (17.1)
	Divorced or separated	84 (10.4)
	Widowed	1 (0.1)
Nationality	Brazilian	5 (0.6)
	Spanish	2 (0.2)
	Portuguese	800 (98.9)
	Swiss	1 (0.1)
	Venezuelan	1 (0.1)
Education level	Primary education	88 (10.9)
	Secondary education	500 (61.8)
	Bachelor's degree	142 (17.6)
	Master's degree	75 (9.3)
	Doctorate	3 (0.4)
	Post-doctorate	1 (0.1)
Health problems	Yes	185 (22.9)
	No	624 (77.1)
Medication	Yes	269 (33.3)
	No	525 (64.9)
PTSD criteria	First responders	102 (15.2)
	General community	18 (13.1)

2.2. Instruments

Sociodemographic Questionnaire Questions were developed by the research team to collect information on age, sex, marital status, nationality, residence, educational background, professional activity, years in professional activity, household monthly income, number of people in the household, number of dependents, any existing illnesses, and whether the respondents were taking any medication.

BSI – Brief Symptom Inventory [29](Portuguese version [30]) This instrument consists of 53 items and assesses psychopathological symptoms across nine dimensions of symptomatology (Somatization, Obsessions-Compulsions, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism) and three Global Indices (Global Severity Index – combines the intensity of distress with the number of symptoms reported, Positive Symptom Distress Index – measures symptom intensity, and Positive Symptom Total – number of symptomatic complaints), providing summarised assessments of emotional disturbance. Participants indicate the symptoms or problems that affected them in the past week using a 5-point Likert scale (0 = Never; 1 = Rarely; 2 = Sometimes; 3 = Often; and 4 = Very often). A mean score is calculated from the responses for each dimension. A mean score of 1.7 or higher indicates the presence of the disorder [30]. This instrument demonstrates high internal consistency in this study, with a Cronbach’s alpha value of .98.

Life Events Checklist-5 (LEC for DSM-5 [31]; LEC-5, Portuguese version [32]). The LEC-5 is a self-report instrument designed to screen for potentially traumatic experiences and assess the type of exposure to each traumatic experience. It consists of 17 items, 16 of which assess exposure to specific categories of traumatic events (e.g., natural disasters, sexual violence), and one item, labelled “other,” refers to other potentially traumatic experiences not covered by the previous items. Participants can respond to each type of exposure on a 5-point scale (*It happened to me; I witnessed it; I learned about it; It's part of my job; and does not apply*) [33]. This instrument shows good internal consistency, with a Cronbach's alpha value of .77. The Portuguese version of LEC-5 will be used in conjunction with the PCL-5 to establish an association with the traumatic experiences described in Criterion A for PTSD diagnosis.

PCL-5 (Posttraumatic Stress Disorder Checklist for DSM-5) [31,33]; Portuguese version [32]): The PCL-5 is a self-report instrument containing 20 items divided into 4 subscales corresponding to the DSM-5 symptom criteria for PTSD. Criterion A – exposure to traumatic events – is assessed through LEC-5. Item 1-5 correspond to Criterion B – Intrusive symptoms (e.g., “*Repeated, disturbing dreams about the stressful event?*”); Item 6-7 correspond to Criterion C – Avoidance (e.g., “*Avoiding memories, thoughts, or feelings related to the stressful event?*”); Item 8-14 correspond to Criterion D – Negative alterations in cognition and mood (e.g., “*Trouble remembering important parts of the stressful event?*”); Item 15-20 correspond to Criterion E – Marked alterations in arousal and reactivity (e.g., “*Irritable behaviour, angry outbursts, or acting aggressively?*”). Participants rated the impact of traumatic events during the last month from 0 (“*Not at all*”) to 4 (“*Extremely*”). According to the DSM-5, a participant must score at least 2 (“*Moderately*”) on one item in each subscale to be diagnosed with PTSD (APA, 2013), with a total score ranging from 0 to 80. The severity of the symptoms increases with the total score [34]. This instrument in this study demonstrates high internal consistency, with a Cronbach's alpha of .96, including the subscales Intrusive symptoms ($\alpha = .93$), Avoidance ($\alpha = .91$), Negative alterations in cognition and mood ($\alpha = .92$), and marked alterations in arousal and reactivity ($\alpha = .88$).

2.3. Procedure

This study was approved by the Ethics Committee of the University (name withheld for review) in March 2023. Subsequently, data collection followed from March 2023 to December 2023. Participant recruitment occurred via convenience and snowball sampling methods. Study information and link to the questionnaire were distributed in social media platforms (Facebook and WhatsApp), and several institutional contacts were made, where two official European Portuguese entities – Associação Sindical dos Profissionais de Polícia (ASPP [Police Union Association]) and Guarda Nacional Republicana (GNR [National Republican Guard]) – agreed to disseminate the study with their employees.

2.4. Statistical Analysis

The data analysis was conducted using SPSS Statistics 28.0.0.0, employing both descriptive and inferential approaches. To determine whether traumatic events were associated with the various dimensions of the BSI and the criteria for diagnosing PTSD, two Spearman correlations were performed. Correlation coefficients were interpreted according to Field (2024), where a correlation was considered small if its value was between 0.1 and 0.29, medium if between 0.3 and 0.49, and large when higher than 0.5 [35]. To compare the presence of psychopathological and PTSD symptoms between the general Portuguese community sample and the sample of first responders, four multivariate analyses of variance (MANOVA) were conducted. Age was used as a covariate in all four MANOVA calculations. Since the homogeneity of covariance matrices between groups was not equal ($p < 0.001$), the MANOVA analysis was based on the Wilks' Lambda p-values (sig). Multiple linear regression analysis was used to determine if the independent variables could predict the total PTSD symptom index as the dependent variable. The independent variables were hierarchically divided into three blocks: the first block consisted of anxiety, depression, somatization, obsessive-compulsive tendencies, interpersonal sensitivity, hostility, phobic anxiety, paranoid ideation, and

psychoticism; the second block consisted of *traumatic events that happened to me, traumatic events that are part of my job, traumatic events I witnessed, and traumatic events I heard about*; and the third block consisted of demographic variables such as age, gender, education level, time in the current professional position, monthly household income, number of household members, health problems, medication use, and number of dependents. This blockwise hierarchical regression analysis was conducted to examine the proportion of variance explained by each block, given that the blocks included variables of differing typologies (e.g., traumatic experiences versus psychological symptomatology).

3. Results

3.1. Traumatic Events (General Community vs. First Responders)

Across the sample, exposure to a wide range of potentially traumatic events was reported. Among first responders (FR), 42.4% experienced a transportation accident personally, 36.0% had witnessed one, and 54.0% reported it as part of their occupational duties. Physical assault was similarly prevalent, with 42.0% reporting personal experience, 34.4% witnessing it, and 54.0% occupational exposure. Fire or explosions were witnessed by 41.4% and reported as occupational events by 54.0%. Sudden violent death and unexpected accidental death were frequently occupational, reported by 57.4% and 50.7% of FR, respectively. Sexual assault was personally experienced by 2.4% of FR, whereas other unwanted sexual experiences were reported by 6.1%. Less common events included captivity (0.6%) and combat-related exposure in war zones (10.9%). In the general community (GC), rates of personal trauma exposure were generally lower or comparable for natural disasters (16.1% FR vs. 15.3% GC), fire or explosions (13.7% FR vs. 15.3% GC), and transportation accidents (42.4% FR vs. 42.3% GC). However, GC participants reported higher rates of personal sexual assault (12.4%) and other unwanted sexual experiences (28.5%) compared to FR. Occupational exposure in the GC group was markedly lower across most categories, for example, work-related fire or explosion (5.1%), transportation accidents (4.4%), physical assault (7.3%), and sudden violent death (7.3%). Overall, FR reported substantially higher rates of occupational trauma across nearly all event categories, whereas the GC reported higher personal exposure for sexual and other unwanted sexual experiences.

3.2. Association Between Trauma Types, PTSD Symptoms, and Psychological Symptoms (BSI) in First Responders and the General Community

Regarding the correlations between trauma types, PTSD symptoms, and psychological symptoms (BSI) among first responders, work-related trauma showed small positive correlations with direct trauma ($r = .155, p < .01$), witnessed trauma ($r = .423, p < .01$), and heard-of trauma ($r = .335, p < .01$), but was not significantly correlated with Criterion B, Criterion C, Phobic Anxiety, or Psychoticism symptoms. Direct trauma demonstrated small positive correlations with all PTSD Criteria and Psychological symptoms, ranging from $r = .228$ to $r = .295$ ($p < .01$), except for Phobic Anxiety and Psychoticism symptoms. Witnessed trauma was positively correlated with all variables ($r = .155-.384, p < .01$). Heard-of trauma showed negligible to small correlations with Criterion C ($r = .116, p < .01$), Criterion D ($r = .078, p < .05$), Obsessive-Compulsive symptoms ($r = .089, p < .05$), Interpersonal Sensitivity symptoms ($r = .101, p < .01$), Depression symptoms ($r = .097, p < .05$), Hostility symptoms ($r = .112, p < .01$), and Paranoid Ideation symptoms ($r = .136, p < .01$). In the general community, work-related trauma was not significantly correlated with any Criteria or Psychological symptoms. Direct trauma showed small positive correlations with Criterion B ($r = .273, p < .01$), Criterion C ($r = .287, p < .01$), Criterion D ($r = .275, p < .05$), Criterion E ($r = .305, p < .01$), and with several Psychological symptoms, including Somatization symptoms ($r = .271, p < .01$), Depression symptoms ($r = .186, p < .05$), Anxiety symptoms ($r = .210, p < .05$), Hostility symptoms ($r = .298, p < .01$), Phobic Anxiety symptoms ($r = .290, p < .01$), Paranoid Ideation symptoms ($r = .223, p < .01$), and Psychoticism symptoms ($r = .159, p < .01$). Witnessed trauma in the general community

did not show significant correlations with any PTSD Criteria or Psychological symptoms. Heard-of trauma was also not significantly correlated with any variables in this group. Finally, in both samples, the PTSD criteria were strongly intercorrelated ($r = .533-.777$, $p < .01$ in FR; $r = .506-.777$, $p < .01$ in GC) and showed moderate to strong positive correlations with Psychological symptoms ($r = .366-.846$, $p < .01$ in FR; $r = .366-.780$, $p < .01$ in GC).

3.3. Multivariate General Linear Model (GLM)

The first MANOVA (Table 2) compared the two groups (first responders and general community) based on four dependent variables (traumatic events that are part of my job; traumatic events that happened to me; traumatic events I witnessed; traumatic events I heard about), and revealed a significant effect of the independent variable on the variables traumatic events (that are part of my job, traumatic events I witnessed, and traumatic events I heard about). However, no significant effect was found for the variable of traumatic events that happened to me.

Table 2. Traumatic events in the Professional Activity groups (First Responders and General Community).

	Professional activity	M (SD)	Mean square	F	Sig	Parcial η^2
Traumatic events that are part of my job			3360.01	142.87	<0.001	0.151
	FR	6.39 (5.17)				
	GC	0.96 (2.76)				
	Total	5.47 (5.26)				
Traumatic events that happened to me			5.558	1.122	0.290	0.001
	FR	2.39 (2.21)				
	GC	2.61 (2.32)				
	Total	2.47 (2.23)				
Traumatic events I witnessed			126.625	10.989	<0.001	0.013
	FR	3.30 (3.57)				
	GC	2.25 (2.30)				
	Total	3.12 (3.41)				
Traumatic events I heard about			101.239	4.691	0.031	0.006
	FR	4.43 (4.80)				
	GC	3.48 (3.81)				
	Total	4.28 (4.66)				

Note. FR = First responders (N = 672); GC = General community (N = 137).

3.4. Presence of PTSD and Psychopathological Symptoms in Both Groups

The results of the second MANOVA (Table 3) showed a significant effect of the occupational variable for somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, and psychoticism symptoms, but not for the hostility, phobic anxiety, and paranoid ideation symptoms, with age as a controlled covariate. In all cases where differences between groups were found, the general community had higher means than the first responders.

In the third MANOVA (Table 4), the variable Professional Activity did not have a significant effect on any of the variables: Criterion B ($p = 0.472$); Criterion C ($p = 0.118$); Criterion D ($p = 0.175$);

and Criterion E ($p = 0.478$). The variable Age was tested as a covariate and did not show a significant effect on any of the variables: Criterion B ($p = 0.234$); Criterion C ($p = 0.909$); Criterion D ($p = 0.227$); and Criterion E ($p = 0.831$).

Table 3. BSI dimensions in the Professional Activity groups (First Responders and General Community).

	Professional activity	M (SD)	Mean square	F	Sig	Parcial n²
Somatization			108.77	6.75	0.010	0.008
	FR	3.51 (4.12)				
	GC	4.50 (3.65)				
	Total	3.68 (4.06)				
Obsessions-Compulsions symptoms			106.27	6.09	0.014	0.008
	FR	6.31 (4.15)				
	GC	7.27 (4.31)				
	Total	6.47 (4.19)				
Interpersonal Sensitivity symptoms			62.96	7.66	0.006	0.009
	FR	3.32 (2.84)				
	GC	4.06 (3.00)				
	Total	3.44 (2.88)				
Depression symptoms			143.10	7.73	0.006	0.010
	FR	4.73 (4.26)				
	GC	5.85 (4.51)				
	Total	4.92 (4.32)				
Anxiety symptoms			108.80	7.40	0.007	0.009
	FR	4.28 (3.79)				
	GC	5.26 (4.04)				
	Total	4.44 (3.85)				
Hostility symptoms			2.88	0.28	0.598	0.000
	FR	4.20 (3.29)				
	GC	4.35 (2.80)				
	Total	4.22 (3.21)				
Phobic Anxiety symptoms			5.19	0.78	0.376	0.001
	FR	1.65 (2.58)				
	GC	1.87 (2.56)				

	Total	1.70 (2.57)				
Paranoid			21.48	1.56	0.212	0.002
Ideation						
symptoms	FR	5.85 (3.70)				
	GC	6.28 (3.74)				
	Total	5.92 (3.72)				
Psychoticism			90.91	9.25	0.002	0.011
symptoms	FR	2.80 (3.11)				
	GC	3.69 (3.30)				
	Total	2.95 (3.16)				

Note. FR = First responders (N = 672); GC = General community (N = 137); BSI = Brief Symptom Inventory.

Table 4. Comparisons of the severity of self-reported diagnostic symptoms of PTSD among First Responders and in the General Community.

	Professional activity	M (SD)	Mean square	F	Sig	Partial η^2
Criterion B			1.369	0.518	0.472	0.001
	FR	1.02 (1.63)				
	GC	1.13 (1.60)				
	Total	1.04 (1.63)				
Criterion C			1.707	2.444	0.118	0.003
	FR	0.52 (0.82)				
	GC	0.65 (0.89)				
	Total	0.54 (0.84)				
Criterion D			7.032	1.845	0.175	0.002
	FR	1.18 (1.93)				
	GC	1.43 (2.08)				
	Total	1.22 (1.95)				
Criterion E			1.548	0.503	0.478	0.001
	FR	1.44 (1.79)				
	GC	1.32 (1.57)				
	Total	1.42 (1.75)				

Note. FR = First responders (N = 672); GC = General community (N = 137); Criterion B = Intrusive symptoms; Criterion C = Avoidance; Criterion D = Negative alterations in cognition and mood; Criterion E = Marked alterations in arousal and reactivity.

3.5. BSI Positive Symptoms, PTSD Positive Symptoms Index, and Trauma Exposure Among the General Community and First Responders

Univariate analyses of variance were conducted to examine group differences (General Community vs. first Responders) across different types of trauma exposure (Table 5), while controlling for age as a covariate. Significant group effects were found for work-related trauma exposure, $F(1, 773) = 67.81, p < .001$, partial $\eta^2 = .007$. A significant group effect was also observed for witnessed trauma (“I saw it happen”), $F(1, 773) = 9.38, p = .002$, partial $\eta^2 = .012$.

No significant group differences were found for vicarious trauma (“I heard about it”), $F(1, 773) = 3.58, p = .059$, or for PTSD Positive Symptoms Index, $F(1, 773) = 1.50, p = .221$.

Additionally, a significant group difference was observed for psychological symptom severity, as measured by the BSI Positive Symptoms, $F(1, 773) = 10.86, p = .001$, partial $\eta^2 = .014$.

Table 5. BSI positive symptoms, PTSD positive symptoms index, and Traumas according to professional activity groups (First Responders and General Community).

	Professional activity	M (SD)	Mean square	F	Sig	Partial n²
BSI positive symptoms			1.692	10.858	0.001	0.014
	FR	1.40 (0.39)				
	GC	1.52 (0.43)				
	Total	1.42 (0.40)				
PTSD positive symptoms index			339.328	1.502	0.221	0.002
	FR	35.40 (14.87)				
	GC	37.18 (15.76)				
	Total	35.70 (15.02)				
Traumatic events that are part of my job			3197.337	135.100	<0.001	0.149
	FR	6.46 (5.17)				
	GC	1.01 (2.84)				
	Total	5.55 (5.27)				
Traumatic events that happened to me			9.555	1.949	0.163	0.003
	FR	2.40 (2.20)				
	GC	2.70 (2.34)				
	Total	2.45 (2.22)				
Traumatic events I witnessed			110.076	9.383	0.002	0.012

	FR	3.35 (3.60)			
	GC	2.34 (2.34)			
	Total	3.19 (3.44)			
Traumatic events I heard about		78.108	3.579	0.59	0.005
	FR	4.49 (4.81)			
	GC	3.64 (3.87)			
	Total	4.35 (4.68)			

Note. FR = First responders; GC = General community; BSI = Brief Symptom Inventory.

3.6. Multiple Linear Regression – Predictors of PTSD Symptoms

Thus, the analysis resulted in a statistically significant model [$F(13,740) = 98.193$; $p < 0.001$; $R^2 = 0.633$], including the variables from the first and second blocks, explaining 63% of the variance (Table 6). In the first block of variables, anxiety symptom ($\beta = 0.901$; $t = 4.684$; $p < 0.001$), depression symptoms ($\beta = 0.457$; $t = 2.686$; $p = 0.007$), obsessions-compulsions symptoms ($\beta = 0.367$; $t = 2.511$; $p = 0.012$), hostility symptoms ($\beta = 0.445$; $t = 2.505$; $p = 0.012$), paranoid ideation symptoms ($\beta = 0.440$; $t = 2.965$; $p = 0.003$), and psychoticism symptoms ($\beta = 0.463$; $t = 2.052$; $p = 0.041$) were found to be predictors of the total PTSD symptoms index. In the second block, only the variable traumatic events that happened to me ($\beta = 0.582$; $t = 3.429$; $p < 0.001$) was found to be a predictor of the total PTSD symptom index. The variables included in the third block were not statistically significant in building the explanatory model for the dependent variable (R^2 change = 0.007; $p = 0.088$).

Table 6. Hierarchical Regression Analysis of Predictors of the Total Index of PTSD Symptoms.

	B	β	t	R^2	R^2 (adjust)
Predictors				.633	.627
Block 1				.620	.616
Anxiety	0.901	0.233***	4.684		
Depression	0.457	0.133**	2.686		
Somatization	0.171	0.046	1.201		
Obsessions-Compulsions	0.367	0.102*	2.511		
Interpersonal Sensitivity	0.000	0.000	-0.002		
Hostility	0.445	0.096*	2.505		
Phobic Anxiety	0.251	0.043	1.190		
Paranoid Ideation	0.440	0.109**	1.190		
Psychoticism	0.463	0.098*	2.052		
Block 2				.633	.627
TE that happened to me	0.582	0.086***	3.429		
TE that are part of my job	-0.092	-0.032	-1.283		
TE I witnessed	0.223	0.051	1.848		
TE I heard about	0.079	0.024	0.968		
Block 3				.640	.630
Age	-0.073	-0.43	-1.144		
Gender	-0-2060	-0.55*	-2.191		
Education level	0.489	0.026	1.077		
Time in the current professional position	0.078	0.048	1.294		
Monthly household income	-0.430	-0.40	-1-536		
Number of household members	-0.714	-0.057	-1.560		

Health problems	0.852	0.024	0.887
Medication use	-0.759	-0.024	-0.839
Number of dependents	0.818	0.051	1.499

Note. ***= $p < 0.001$; ** = $p < 0.01$; * = $p < 0.05$; TE = Traumatic events.

3.7. ANOVA

An ANOVA was conducted to determine if the variable marital status was associated with the dependent variable, the total *PTSD symptom index*. However, the results showed no significant differences between groups ($p=0.333$).

4. Discussion

Regarding the first objective, 76.4% of the sample (75.4% of first responders and 81% of the general community) responded affirmatively to the variable traumatic events that happened to me, indicating that they had experienced some type of traumatic event at least once in their lives. These alarmingly high results are like recent studies where 71.1% of the general population reported having experienced a traumatic event [36], with equivalent data from the Portuguese population showing that 69% reported having experienced at least one traumatic event in their lifetime [37].

Consistent with previous studies, the results confirmed that first responders are exposed to a greater number of traumatic events [4–6] compared to the general community [36]. When considering different experiences of traumatic events, such as the total number of traumatic experiences, those participants witnessed, those they heard about, and especially those that were part of their job, these were significantly more frequent among first responders compared to the general community. Regarding traumatic experiences that were personally experienced, there were no significant differences between the groups.

Greater exposure to traumatic events can be easily explained by the situations first responders experience and the intense emotions they feel in their daily work. Their roles often involve physical tasks such as detention, foot or vehicle pursuits, and handling all types of emergency calls that pose threats to themselves or others [38]. Although not all experiences considered critical incidents are specified [39], the context in which these professionals perform their duties tends to indicate that many of these are indeed traumatic events [40].

Regarding the second objective, based on the observed correlations, it appears that traumatic events among first responders are more associated with the development of psychopathological symptoms and PTSD compared to the general community. This is evidenced by significant correlations between nearly all trauma-related variables and the dimensions assessed by the PCL-5 and BSI instruments in the first responders' group. In contrast, within the general community, only the variable *direct trauma* was associated with PTSD and psychopathological symptoms.

As previously discussed, due to the nature of their profession and responsibilities, first responders are exposed to traumatic events daily [4–6]. Since their role involves confronting such situations and attempting to resolve or mitigate danger, these professionals may be more alert and ascribe greater significance to all events they become aware of, whether witnessed directly, reported by others, or indirectly observed, as these experiences are inherently linked to their occupational duties. The exposure to traumatic events has increasingly been linked to mental health issues in previous studies [9], has also been associated with PTSD symptoms in studies involving emergency medical professionals [11]. In First responders, in line with previous research, this study showed significant positive correlations, although small and very weak, between some of the traumatic event variables (*those that happened to me*, *those I witnessed*, and *those I heard about*) with criteria B, C, D, and E for PTSD diagnosis. However, the variable *events that are part of my job* correlated only with criterion C and E, referring to avoidance and alterations in arousal and reactivity, are crucial in the performance of these professions.

In previous studies [41,42], professionals such as police officers and firefighters reported that unexpected or uncontrollable events, especially those that put their lives in danger, could be more

threatening, and work-related situations were perceived as more stressful. These results reinforce the notion that exposure to traumatic events is associated with the development of conditions such as PTSD, depression, and anxiety [43]. In this sense, previous literature suggests that professionals who are more exposed to traumatic events are more likely to develop PTSD symptoms [44].

In the third objective and according to previous literature, we expected significant differences in the presence of psychopathological symptoms between first responders and the general community, where first responders were more likely to present psychopathological symptoms. Our results showed significant differences, but they did not confirm these expectations. First responders reported experiencing a higher number of traumatic events, and statistically significant differences were found between first responders and the general community in six BSI dimensions (*somatization, obsessions-compulsions, interpersonal sensitivity, depression, anxiety, and psychoticism*). Notably, mean scores of all nine BSI dimensions were higher in the general community compared to first responders. In the same vein, group differences were also evident in the total number of positive symptoms (BSI Positive Symptoms), with the general community consistently reporting a higher number of symptoms.

Some studies support our findings, where the general community exhibited higher levels of mental health pathology [45]. For example, a study of emergency medical professionals and first responders during COVID-19 in Wales, UK, found that First responders participants reported lower stress levels than the general population [46]. Similarly, in Portugal, a study with a sample of 78 police officers showed anxiety and depression symptoms that were comparable to normal levels for the general population [47].

Results from these studies suggest that, although first responders are exposed to a greater number of traumatic events daily, they seem to be less affected than the general community, presenting lower levels of depression and anxiety symptoms. This can be explained by the training inherent to these professions, their sense of self-efficacy, self-esteem, experience, the “hero lifestyle” (sacrificing one’s life for the lives of others), and Terror Management Theory (TMT) [48]. TMT posits that while death is inevitable and unpredictable, it can depend on the situations created or experienced by each individual. According to Rodriguez and collaborators (2016), this theory suggests that first responders acknowledge the dangers of traumatic events but develop decision-making strategies to preserve their own lives and those of others [49]. They believe in their abilities, the abilities of their partners, and the purpose of their mission, which helps normalize critical situations. The experience of these professionals may also serve as a protective factor against mental health deterioration, as it allows for increased exposure to traumatic events, leading to desensitization, learning from previous experiences, and positive responses to stress and trauma encountered [50].

Regarding the fourth objective and the differences between the groups in the diagnostic criteria for PTSD, it was expected that significant differences would emerge between the studied groups. However, despite the greater exposure of first responders to traumatic events and the observed correlation between traumatic events and PTSD symptoms, no significant differences were found between the groups. None of the DSM-5 criteria for PTSD, nor the PTSD positive symptom index, showed differences between the groups, which contradicts previous studies that demonstrated a higher prevalence of PTSD symptoms among first responders [4] compared to the general community [14].

Several factors may explain the lower levels of anxiety and depression observed among first responders and the absence of differences in PTSD symptoms between them and the general community. These factors include selection processes, training, social desirability, and the “police culture” [51]. As previously mentioned, first responders are constantly exposed to emotional tension caused by stressful and potentially traumatic situations. The selection process for these professions likely plays a crucial role in identifying candidates with leadership qualities, strong stress resilience, risk-taking abilities, high aspirations, and a strong sense of self-actualization, traits described as essential for performing such complex tasks [52]. Similar to selection, training may also act as a mitigating factor in the development of PTSD and other mental health conditions, explaining why,

despite first responders' greater exposure to traumatic events, there are no significant differences between them and the general community [53].

The "police culture" is another critical factor, shaped by the nature of police work, which involves social regulation and authority, and is guided by informal rules and norms derived from the circumstances of their duties. It incorporates qualities such as support, teamwork, empathy, perseverance, and camaraderie, but also fosters distrust, hypervigilance, and social isolation, which can lead to reluctance in seeking help [4]. Police culture can impact in two keyways [54,55]. Firstly, it may negatively influence the results of studies, as individuals might alter their responses due to concerns about confidentiality or the desire to avoid showing vulnerability, thus answering in a socially desirable way (i.e., reflecting the societal expectation that there should be no weakness in these professions) [56,57].

Secondly, police culture can also play a positive role in preventing the development of mental health issues by fostering a sense of "esprit de corps," camaraderie, loyalty, and belonging, which in turn enhances the feeling of social support [58]. Since the group of first responders in this study is not exclusively made up of police officers, these results may not be fully explained by police culture. Still, the significant percentage of police officers among the participants, along with the similarity in roles and characteristics across the sample (including police, firefighters, and emergency medical personnel), suggests that these factors cannot be ignored.

The results of this study showed that high values still exist in both groups for the PTSD criteria, specifically 15.2% for the first responders' group and 13.1% for the general community group, compared to studies with similar samples. After the attacks in Paris in November 2015, 3.4% of firefighters and 9.5% of police officers recorded PTSD values [59], differing from general community groups: a group of young people aged 11 to 19 showed a 1.5% PTSD prevalence [60], and 3.9% (5.6% for those exposed to trauma) of participants over 18 showed a prevalence of the disorder [61]. However, other studies have shown values similar to those observed here: the presence of PTSD symptoms in 10 to 15% of first responders [62]; 14.87% in police officers and 8% in the general population in Canada [63], or 11.1% in the civilian population [64].

PTSD symptoms have been associated with numerous factors over the years. Thus, the fifth and final goal of this study was to understand the factors associated with the presence of these symptoms in the studied samples. First, our results indicated that symptoms of anxiety, depression, obsessions-compulsions, hostility, paranoid ideation, and psychoticism are predictors of PTSD symptoms. Previous research has been consistent regarding anxiety and depression, as both show high comorbidity with PTSD symptoms [2,65] and have been identified as predictors, as observed in a study with 638 veterans of the armed forces living in Ireland [66]. Regarding the various psychopathologies included in the BSI questionnaire (together with the DASS-21 questionnaire, forming a single factor), a study with Portuguese firefighters showed an association with PTSD symptoms [67]. In the general community, the results were similar. In a sample of 7,403 individuals from the UK population, with data from 2007, it was found that PTSD symptoms coexisted with depression, substance abuse, and various anxiety disorders [68].

Traumatic events, as in previous studies [67] and as demonstrated in this study, were also associated with the development of PTSD symptoms. However, only the dimension of *traumatic events that happened to me* was identified as a predictor. Recent research has studied the association between types of traumatic events (accidents, the death of someone, natural disasters, etc.) or the cumulative number of traumatic events [69]. However, there is no literature providing data on how the traumatic events were experienced—whether *it happened to me, I heard about it, I learned it happened, or it is part of my job*. Based on the results presented here, and despite the association between types of traumatic events and the DSM-5 criteria for PTSD, only the traumatic events that happened to me emerged as a predictor.

Demographic variables were tested to determine whether they predicted PTSD symptoms; however, none proved to be explanatory for the pathology, and results contradicted some previous studies [70]. Although our results did not reveal gender differences, previous studies, such as Hyland

et al. (2021), which analysed 1,020 Irish adults, reported gender discrepancy, with women (6.3%) exhibiting a higher prevalence of PTSD than men (3.9%) [2]. In a systematic literature review on the prevalence of PTSD in the United States, Schein and colleagues (2021) note that, despite the presence of incongruent data due to different methodologies, designs, and populations, PTSD prevalence is higher in at-first responders, refugees, individuals with substance abuse issues, transgender men, women, and younger individuals [70]. Not limited to PTSD but including other disorders, a study with 5,813 at-first responders in Canada concluded that younger individuals, with fewer years of service, who were single, separated, divorced, or widowed, female, and had a university degree showed a higher prevalence of mental disorders [40].

5. Conclusions

European Portuguese first responders are exposed daily to a higher number of traumatic events compared to the European Portuguese general community. In our study, we demonstrated that individuals with greater exposure to these events do not always present higher levels of psychopathology and PTSD symptoms. Additionally, our results did not show a significant relationship between demographic factors (age, gender, economic situation, etc.) and the development of PTSD symptoms, which indicates that other factors could be influencing the development of PTSD symptoms.

Despite similar findings with previous studies, these findings must be interpreted with caution since varying methodological designs of these studies (e.g., type of sample, geographical location, and instruments used to assess the presence of traumatic events) may have influenced the results [1,36]. In the present study, the wide age range and most participants belonging to first responders [71,72] may have influenced these results.

Future research should focus on exploring factors such as death management theory, training and selection processes, the hero lifestyle, and police culture within certain populations, to better understand why first responders show levels of psychopathology and PTSD similar to the general community, despite higher exposure to traumatic events.

Our sample, composed of individuals from the European Portuguese general population and first responders, shows concerning levels of the presence of psychopathology and PTSD symptoms and PTSD diagnosis, indicating an urgent need to identify, treat, and prevent this phenomenon in this population. Consequently, culturally adapting and validating psychoeducational tools and resources to develop resilience and enhance training, education, and selection processes for first responders may be essential to address this issue. To raise awareness among the general population about the need to seek professional help, and especially among first responders, to break the still-existing taboo around seeking such help to improve their mental health.

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Abbreviations

The following abbreviations are used in this manuscript:

PTSD	Post-Traumatic Stress Disorder
BSI	Brief Symptom Inventory
COVID	Coronavirus Disease
LEC	Life Events Checklist
GNR	Guarda Nacional Republicana
DSM	Diagnostic and Statistical Manual of Mental Disorders
PCL	Posttraumatic Stress Disorder Checklist
MANOVA	Multivariate Analysis of Variance
APA	American Psychiatric Association
ASPP	Associação Sindical dos Profissionais de polícia
SPSS	Statistical Package for the Social Sciences
TMT	Terror Management Theory

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