

Article

Connecting the Dots: Occupational Stressors and PTSD Symptoms as Serial Mediators of the Relationship between Fear of COVID-19 and Burnout among Portuguese Police Officers

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Abstract: Police officers are exposed to several operational and organizational stressors that significantly impact on their mental health. The COVID-19 pandemic was a new stressor that further exacerbated existing stressors, highlighting the need for a better understanding of its impact on the mental health of police officers. This study tested the hypothesis that occupational stressors and PTSD are serial mediators of the relationship between fear of COVID-19 and burnout. Two hundred Portuguese police officers completed an online survey that assessed their fear of COVID-19, exposure to operational and organizational stressors, PTSD, and burnout. The results of the serial mediation analysis indicated that not only do occupational stressors act as mediators between fear of COVID-19 and burnout but also that PTSD is a mediator. The findings of this study underscore the need for interventions to reduce the negative impact of operational and organizational stressors on the mental health of police officers. Furthermore, this study highlights the power of police institutions for prevention and intervention with these professionals. By recognizing the specific stressors that contribute to the development of PTSD and burnout, our study provides a foundation for the development of direct interventions that can help to minimize the adverse effects of these stressors

Keywords: COVID-19; operational and organizational stressors; PTSD; burnout; police officers; serial mediation



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1. Introduction

Being a police officer is commonly identified as one of the most dangerous jobs, and holds a lot of occupational stressors. These occupational stressors can be divided into operational (e.g., exposure to dead bodies, seriously injured or dead children, suffering some kind of verbal or physical aggression during service, helping a colleague who tried to commit suicide or who committed suicide) and organizational stressors (e.g., problems with equipment, excessive paperwork, lack of recognition) [1]. This profession is also prone to exposure to potentially traumatic events (PTEs), such as sexually assaulted children, lacerated bodies, or exposure to severely assaulted individuals [2]. These PTEs are only a small part of the kinds of events to which police officers are consistently exposed. Several authors have reported that repeated exposure to such events can have adverse effects on the mental health of police officers, including the development of post-traumatic stress disorder (PTSD) [3,4] and burnout [5]. The literature has demonstrated a positive correlation between PTSD and burnout [6,7]. Additionally, Schutt and Marotta [8] discovered it to be a significant predictor for PTSD symptoms.

According to Liberman et al. [3], exposure to routine occupational stressors, except critical incidents, appears to be a substantial risk factor for poor mental health in police

officers and a predictor of PTSD symptoms. Additionally, it is also important to note that research has shown that, it is more the interaction between operational and organizational stressors that has the greatest impact on mental health, particularly at the level of PTSD symptoms [9].

When in 2020 severe acute respiratory syndrome coronavirus 2 (commonly denominated as COVID-19) became a pandemic, citizens and police around the world had to face new challenges and learn to adapt to a previously unknown enemy. When the first case was identified in Portugal in March 2020, police officers were instructed to put several public safety measures in place to stop the virus from spreading, such as controlling the points of entry and exit of cities and the country and supervising social distance. At the same time, police had to deal with no days off, overtime pressures such as work schedules and relocation of officers from operational and organizational services to the COVID-19 management teams, wearing masks, dealing with restraining negationist manifestations, and unclear communication, and a high number of infections within police stations [10]. Additionally, because of their high exposure to the population and consequently high exposure to the virus, the thought of putting their families in danger became one of the highest fears among these professionals [11]. All of this increased the feeling of vulnerability, stress, and burnout among officers [12].

Research has already shown with past pandemics that exposure to highly stressful events negatively affects psychological well-being [13], and for the COVID-19 pandemic it was no different. Several studies have already shown the negative impact of the COVID-19 pandemic on police officers' well-being. In particular, PTSD and burnout symptoms [11,12,14–17] have been widely studied.

The present study was carried out during the COVID-19 pandemic, which involved changes in the routines of these professionals. Based on previous research, it is known that the interaction between operational and organizational stressors is a predictor of poor mental health and PTSD [9]. Moreover, research also shows that PTSD is a predictor of burnout [8]. Additionally, according to the job demands–control model (JDC) [18], the pressure at work intensifies with the increase in the demands of the work and decreases control and predictability, which in turn results in physical and mental problems [14]. Therefore, this study considered three hypotheses: (1) The interaction between operational and organizational stressors mediates the relationship between fear of COVID-19 and burnout, (2) the interaction between operational and organizational stressors mediates the relationship between fear of COVID-19, and (3) the relationship between fear of COVID-19 and burnout is serially mediated by the combination of stressor interaction and PTSD in the sequence in Figure 1.

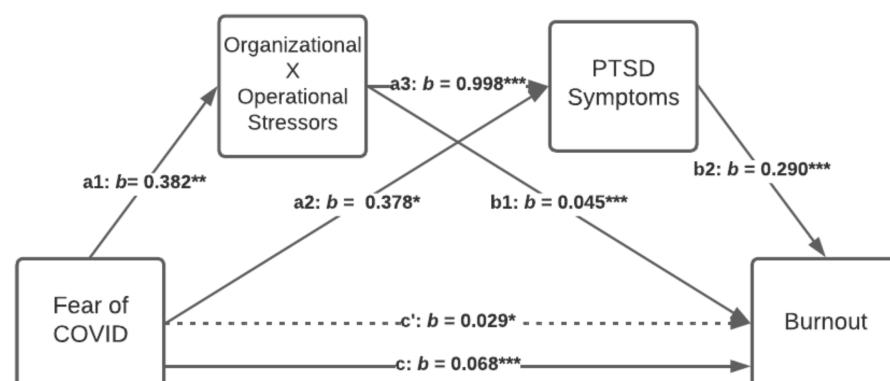


Figure 1. The estimated multiple mediator model with organizational and operational stressors interacting, and post-traumatic stress disorder (PTSD) symptoms as proposed mediators of the relationship between fear of COVID-19 and burnout. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

2. Materials and Methods

2.1. Participants

The sample comprised 200 participants, of whom 184 (92%) were male, aged between 26 and 63 years old ($M = 44.4$; $SD = 7.2$). One-hundred and sixty-four participants (82%) were married or in a de facto marital status, and 165 (83%) had at least one offspring. Regarding professional variables, the majority had a low job rank ($n = 189$; 95%) and had a mean of 18.2 years ($SD = 7.3$) of job experience, and 142 (71%) participants worked in shifts.

2.2. Procedure

As part of a Ph.D. project, the ethics committee of [the University of Minho—CEICSH 061/2019] approved this study, and all procedures followed the Helsinki Declaration. Three police organizations were invited to participate in the study. Following release from police organizations, namely, the National Republican Guard (GNR), the Public Security Police (PSP), and the Judicial Police (PJ), an email containing the study survey link was sent to the police commanders of Portugal's northern area. The commanders then distributed the survey to the officers, allowing respondents to examine the online informed consent before beginning the survey. Participation was anonymous and confidential, and this was explained in the informed consent. At the end of the survey, participants had the option to leave their email contact if they wished to have access to their individual results. The results were analyzed solely and exclusively by the person responsible for the project, who is a clinical psychologist and is under professional secrecy. All participants who showed clinical distress were provided with psychological support by the person responsible for the investigation, who is a clinical and health psychologist with more than 5 years of clinical experience. The intervention offered to police officers is trauma-focused cognitive behavior therapy, as suggested by the APA. Participants could stop answering the questionnaire at any point if they did not wish to continue completing it. Participants did not receive any monetary incentive for their participation. The general and anonymized data were presented to the police commanders. In this presentation, only statistical prevalence was shared. All measurements were written in Portuguese. Data collection for the present study occurred between October 2020 and September 2022.

2.3. Measures

2.3.1. Sociodemographic Questionnaire

Age, sex, marital status, number of offspring, and specific questions related to occupation, such as professional category, length of job experience, and work-home distance, were all included in the sociodemographic questionnaire.

2.3.2. Fear of COVID-19 Scale (Ahorsu et al., 2020 [19]; Portuguese Version: Sousa et al., 2023 [10])

This scale was created to assess the severity of fear of COVID-19. A 7-item Likert scale is used to assess people's level of dread of COVID-19 infection. The responses range from 1 to 5 (1 = strongly disagree; 5 = strongly agree). The sum of the item scores, which range from 7 to 35, is used to determine the final score. The greater the level of fear of COVID-19 infection, the higher the score. According to Nikopoulou and colleagues [20], a cutoff point score of 16.5 or higher reveals significantly poor mental health. The Portuguese version [10] demonstrated a good internal consistency of $\alpha = 0.89$.

2.3.3. Operational and Organizational Police Stress Questionnaire (PSQ-Op; PSQ-Org.) (McCreary et al., 2017 [21]; Portuguese Versions: Queirós et al., 2020 [22]; Queirós et al., 2020 [1])

These questionnaires were developed to assess operational and organizational job stress sources among police officers. The PSQ-Op and the PSQ-Org are 20-item scales evaluated on a 7-point Likert scale, where higher scores indicate higher stress levels, with a score of 4 or higher being an indicator of high stress. Both questionnaires range from 1 to 7 (1 = not at all stressful to 7 = very stressful). The calculation is done through the mean of each subscale. The original authors established norms and cutoff values, with values below

2.0 indicating low stress, between 2.1 and 3.4 moderate stress, and above 3.5 high stress. Both Portuguese versions [1,22] demonstrated an excellent internal consistency of $\alpha = 0.96$. In the present study, Cronbach's alpha was 0.95.

2.3.4. Post-Traumatic Stress Disorder Checklist for DSM-5 (Blevins et al., 2015 [23]; Portuguese Version: Silva et al., 2021 [24])

This 20-item questionnaire is a self-reported measure to assess PTSD symptoms. PCL-5 is a 5-point Likert scale (0 = not at all; 4 = extremely), with the total score varying from 0 to 80, where higher scores indicate a higher level of PTSD symptomatology. In the Portuguese version [24] the internal consistency was excellent ($\alpha = 0.94$). In the present study the internal consistency was also excellent ($\alpha = 0.96$).

2.3.5. Shirom–Melamed Burnout Measure (SMBM) (Shirom and Melamed, 2006 [25]; Portuguese Version: Gomes, 2012 [26])

Burnout is a three-dimensional condition that affects professionals with primary responsibilities. Three subscales, identified as physical fatigue, cognitive fatigue, and emotional exhaustion, characterize this measurement [20]. The SMBM is a self-reported measure to assess burnout with a 7-item scale (1 = almost never to 7 = almost always) with the total score varying from 1 to 98. Higher scores indicate a higher intensity of self-rated burnout and values equal to five on the Likert scale are an indicator of problems in this domain [25]. The internal consistency was 0.92, and in this study, it was 0.97.

2.4. Data Analysis

Analyses were conducted using IBM Corp., released 2021, and IBM SPSS Statistics for Windows, version 28.0. Only questionnaires that were fully completed were used for this study. We assessed multivariate outliers by inspecting Mahalanobis, Cook's distance, and leverage values. Participants that scored as outliers in two of the three mentioned indexes were removed from the analysis. The literature states that the interaction between organizational and operational stressors accounts more for the development of burnout than any of these stressors individually. As such, after checking for the absence of multicollinearity, we created an interaction variable by multiplying these two stressors. To determine the relationship between the fear of COVID-19 and burnout, we started by conducting bivariate Pearson correlation analyses. Then, we ran two simple mediation analyses with the stressors and PTSD, first as independent mediators and then as serial mediators, using PROCESS v.3.5, a modeling tool for mediation analysis [27]. We used a serial mediator model based on the product of the coefficients approach to test the hypothesis [28]. This model is appropriate when two mediators in a multiple-mediator model remain correlated after adjusting for the independent variable [27]. We used the bootstrapping method to test the significance of the total and the specific indirect effects ($n = 5000$).

3. Results

3.1. Descriptive Statistics

The total number of participants ($n = 200$) was exposed to at least one traumatic event that meets criterion A for PTSD, with the mean of PTSD symptoms being 15.5 (SD = 15.0) and ranging between 1 and 70. The results showed that 13% ($n = 26$) of the sample reported a total score equal to or higher than 31, which is a cutoff point that may be indicative of a probable PTSD diagnosis. The mean of the Fear of COVID-19 Scale was 15.0 (SD = 5.2); the mean of interaction between operational stressors and organizational stressors was 15.5 (SD = 9.2), ranging between 1 and 41; and the mean of burnout was 2.9 (SD = 1.2). (Table 1) A total of 72.7% completed the questionnaire.

Table 1. Descriptive sociodemographic and psychopathological statistics.

		M	SD
Age		44.4	(7.2)
Years of service		18.2	(7.3)
		<i>n</i>	%
	Sex		
	Male	184	(92.0)
	Female	16	(8.0)
Marital status			
	Single	22	(11.0)
	Married	164	(82.0)
	Divorced	14	(7.0)
At least one offspring		164	(82.5)
Rank patrol			
	Low-rank patrol	189	(94.5)
	Higher-rank patrol	11	(5.5)
Work shift		172	(71.0)
FCV-19S			
	≥16.5	68	(34.0)
PCL-5			
	≥31	26	(13.0)
PSQ-Op			
	<2	26	(13.0)
	≥2	68	(34%)
	≥3.5	101	(50.5)
PSQ-Org			
	<2	13	(6.5)
	≥2	54	(27.0)
	≥3.5	129	(64.5)
Burnout			
	≥5	21	(10.5)

Note: FCV-19S = Fear of COVID-19 Scale; PSQ-Op and PSQ-Org = Operational and Organizational Police Stress Questionnaire; PCL-5 = Post-traumatic Stress Disorder Checklist for DSM-5.

3.2. Bivariate Correlations

Bivariate Pearson correlation revealed that all variables were positively and significantly correlated (Table 2). Correlations between fear of COVID-19 and other variables ranged from a small ($r = 0.26, p < 0.001$) to medium effect size, with the strongest being with burnout ($r = 0.31, p < 0.001$). The correlations between the interaction between organizational and operational stressors and PTSD symptoms represented large effect sizes ($r = 0.61, p < 0.001$), as well as burnout ($r = 0.59, p < 0.001$). Finally, the correlation between PTSD and burnout also showed a large effect size ($r = 0.61, p < 0.001$) (Table 2).

Table 2. Pearson correlations among the assessed variables.

Assessed Variables	FCV-19S	PSQ-Op*PSQ-Org	PCL-5
FCV-19S	-		
PSQ-Op*PSQ-Org	0.260 ***	-	
PCL-5	0.310 ***	0.607 ***	-
Burnout	0.313 **	0.592 ***	0.608 ***

Note: $n = 200$. FCV-19S = Fear of COVID-19 Scale; PSQ-Op*PSQ-Org = interaction between operational stressors and organizational stressors; PCL-5 = Post-traumatic Stress Disorder Checklist for DSM-5. ** $p < 0.01$. *** $p < 0.001$.

3.3. Mediation Analysis—Single Mediators

Two simple mediation models were tested, one with stressors and another with PTSD symptoms, as single mediators for the relationship between the fear of COVID-19 and burnout. Results show that both stressors and PTSD symptoms acted as individual mediators in the aforementioned relationship. When the stressors variable was the mediator, the model was significant ($F(2,197) = 64.33, p < 0.001$) and explained 40% of the variance, with a significant indirect effect (indirect effect: 0.28, SE = 0.01, 95% CI [0.01–0.04]). When PTSD was the mediator, the model was significant ($F(2,197) = 65.71, p < 0.001$) and explained 40% of the variance, with a significant indirect effect (indirect effect: 0.03, SE = 0.01, 95% CI [0.002–0.06]).

3.4. Serial Multiple Mediation Analyses

Before testing the serial mediator model, we assessed whether stressors and PTSD would remain correlated after controlling for fear of COVID-19. The model was significant ($F(2,197) = 72.09, p < 0.001, R^2 = 0.42$) and explained 42% of the variance, indicating that stressors and PTSD share an additional common cause other than fear of COVID-19. Therefore, we tested a serial mediation model using first stressors and PTSD as the serial mediators.

All paths for the model are illustrated in Figure 1, and the corresponding coefficients are provided in Table 3. The overall model was significant ($F(3,196) = 58.22, p < 0.001$) and it explained 47% of the variance. The total effect (c) of fear of COVID-19 on burnout was significant ($\beta = 0.07, t(198) = 4.37, p < 0.001; 95\% \text{ CI } [0.04–0.10]$), but the direct effect of this relationship decreased once controlled for stressors and PTSD ($c'; \beta = 0.03, t(196) = 2.33, p = 0.021; 95\% \text{ CI } [0.004–0.053]$), suggesting a partial mediation. The total sum of specific indirect effects was significant (total indirect effect = 0.04, SE = 0.01, 95% CI [0.02–0.06]). The specific indirect effect through stressors was significant ($a_1b_1 = 0.02, SE = 0.01, 95\% \text{ CI } [0.01–0.03]$), the specific indirect effect through PTSD was significant ($a_2b_2 = 0.01, SE = 0.01, 95\% \text{ CI } [0.001–0.02]$), and after testing the serial multiple mediations, the indirect effect of fear of COVID-19 on burnout through both stressors and PTSD was significant ($a_1a_3b_2 = 0.01, SE = 0.004, 95\% \text{ CI } [0.004–0.21]$). These results partially support the hypothesis that stressors and PTSD sequentially mediate the relationship between fear of COVID-19 and burnout (Figure 1).

Table 3. Path coefficients from the serial multiple mediation model.

Path	b	t(df)	p
a1	0.382	5.02 (198)	0.002
a2	0.378	2.36 (197)	0.020
a3	0.998	10.98 (197)	<0.001
b1	0.045	5.13 (196)	<0.001
b2	0.290	5.31 (196)	<0.001
C	0.682	4.37 (198)	<0.001
c'	0.029	2.32 (196)	0.021

4. Discussion

Policing is a high-stress profession that involves exposure to potentially traumatic events, organizational (e.g., dealing with co-workers, adequacy of equipment, bureaucratic red tape) [1] and operational stressors (e.g., encounters with death, being attacked) [25], and high levels of responsibility. With the COVID-19 pandemic new stressors were added to this already challenging work environment, such as increased workloads and overtime [17], concerns about one's own and loved ones' health and safety, a change in the demand for services, and frequent changes to policing routine [11].

To understand how these stressors affect police officers' mental health during times of crisis, this study aimed to test the relationship between COVID-19 fear and serially mediated burnout by the interaction between operational and organizational stressors and PTSD symptoms in the sequence in Figure 1.

The literature has already shown that the interaction between operational and organizational stressors causes greater psychological damage [9], so we used both occupational stressors in interaction with each other in the analyses.

Our results show a positive association between all the variables, with medium to large effect correlations, where the correlations between fear of COVID-19 and other variables were the lowest. This reinforces our theory that fear of COVID-19 is a further aggravating factor in this already challenging work environment but not the most significant stressor. Furthermore, occupational stressors are positively associated with burnout among other pre-pandemic evaluated professionals [29] and even among those who struggled with COVID-19 [30]. Based on this finding, it can be inferred that increased job stress also leads to increased burnout, especially in times of crisis. The job demands–control model (JDC) [18] suggests that the greater the job demands and the less control and predictability of the job, the higher the pressure at work, which in turn leads to physical and mental problems [14]. In line with this and expanding on the research linking stressors to fear of COVID-19 and burnout, we tested occupational stressors as a simple mediator between fear of COVID-19 and burnout. This model proved to be a partial mediation, which suggests that the relationship between fear of COVID-19 and burnout is consistent with previous investigations [9], which already suggested that this is better explained when occupational stressors are included in the model. This is consistent with the literature that states these stressors greatly impact the mental health of these professionals.

Due to the nature of professional challenges and the high exposure to potentially traumatic events, we also tested the mediating effect of PTSD on the relationship between COVID-19 and burnout. Our results demonstrate a partial mediation, which indicates that including PTSD in the model helps explain the association between fear of COVID-19 and burnout. This is in line with the study of [31], which stated that PTSD symptoms are predictors of burnout in nurses. Hamed and colleagues [31] argued that only 19.5% of nurses diagnosed with burnout also had PTSD, highlighting that the reverse is not always true for nurses with PTSD. This speaks to the vulnerability to burnout of nurses who have PTSD.

As hypothesized, in this sample of police officers, occupational stressors and PTSD symptoms were serial mediators between COVID-19 and burnout. Furthermore, it appears that not only do occupational stressors act as mediators between fear of COVID-19 and burnout, but that PTSD is also a mediator, even among police officers who experienced more potentially traumatic events and among police who consider events related to COVID-19 the most disturbing. This is congruent with our previous study, which found that police officers demonstrated significant differences in operational stressors and fear of COVID-19 between T0 (pre-lockdown) and T1 (during lockdown) but not in PTSD symptomatology [10]. In the same investigation, we argued that given that the reported traumatic experiences occurred on average seven years ago, they are not directly tied to the COVID-19 pandemic [10]. However, statistically significant differences were found in operational stressors, which supports our hypothesis that during the COVID-19 pandemic, occupational stressors and the new challenges that police faced (e.g., reallocation of police personnel from operational and administrative duties, as well as changes to work shifts) had an impact on mental health [32,33], including burnout.

Additionally, our results also suggest that the interaction between operational and organizational stressors is the most salient mediator. However, it did not differ significantly from total PTSD symptoms, which seems congruent with the study by Maguen et al. [9].

4.1. Future Research

This study also revealed various suggestions for police practitioners. First, it increases the knowledge base on how the COVID-19 pandemic affects frontline workers, specifically police officers [11]. Second, this research highlights what had been previously described in the literature: that the interaction between occupational and organizational stressors has a high impact on the mental health of these professionals, even when compared to potentially

traumatic events [9]. As such, we call for police practitioners to recognize the potential long-term psychological effects of exposure to occupational stressors and critical incidents. We also found a strong overlap between PTSD symptoms and burnout and suggest that PTSD symptoms may increase vulnerability to developing burnout because individuals with PTSD symptoms have fewer resources to deal with occupational stressors, and as a result are more prone to burnout.

Police institutions should take the initiative to pre-educate their officers about possible late effects and appropriate coping mechanisms for dealing with routine occupational stressors and develop specialized mental health strategies—specifically, routine psychological assessments and follow-up, as well as promoting a positive work environment and peer support, since research has shown that stress is mediated by the availability of social support and that this support reduces psychological distress and even PTSD symptoms [7].

Exposure to potentially traumatic events is known to be a central feature of, and part of, the police profession. However, occupational stressors (not potentially traumatic events) have a higher impact on the overall functioning of police officers, as there are some indications that we can highlight. First, police organizations should educate and train their officers in advance about potential long-term impacts and effective coping skills for dealing with routine occupational stressors. This can raise awareness among police officers about the mental health impact of the profession and minimize the stigma associated with asking for psychological help. Second, police institutions supporting police officers ought to promote a supportive workplace culture. Based on previous studies, social support reduces psychological distress, PTSD symptoms, and burnout by mediating the effects of stress. Peer support groups might provide officers with a safe and encouraging setting to talk about their experiences and emotions. Third, we suggest that crisis interventions be implemented for everyone who is most likely to be exposed to trauma [34] following a critical event, such as a life-threatening incident, death, or serious injury to children; death or serious injury to colleagues and/or family members; and death by suicide. Fourth, we suggest that law enforcement institutions develop specialized trauma-informed mental health strategies to address the specific needs of police officers. This may include access to mental health professionals trained to work with law enforcement officers, as well as specialized programs and resources to support officers who are experiencing mental health issues. We also note that 98% of participants in a Portuguese study reported that they would prefer this support to be provided by a civilian psychologist who is not connected to the police but who has a thorough knowledge of the specifics of the profession and police culture [29]. Finally, the allocation of resources could be optimized through placements and transfers, resulting in less time-consuming career progression, and prioritizing being close to the areas where the professional resides [35], as well as increasing the number of police officers. In addition, providing monetary reward recognizing the demands of the profession is suggested, which would make the police profession attractive again for young people but also promote the motivation of all other police officers.

As a result, we would like to emphasize that police institutions can do a lot to mitigate the negative impact of the profession, since, when the organizational climate is healthy and balanced, it promotes feelings of trust, protection, support, and satisfaction. Nevertheless, we would also like to recognize that police institutions have experienced increased difficulties in recent years and that the success of the recommendations outlined depends on the resources available.

4.2. Limitations

There are a few limitations related to the methodology that should be considered. First, this is a cross-sectional study, so in terms of time, the predictor must precede the mediator, which must precede the outcome [27]. In other words, cross-sectional data are not usually appropriate for mediation analysis, as all information is collected simultaneously, and we can find a cause–effect between the variables.

As for the strengths, this study alerts us to the complexity of the interactions between the variables under study and their impact on the well-being of these professionals, with direct practical implications for trauma-informed organizations.

As noted above, longitudinal studies, especially of professionals, are essential, as they can monitor a group of police officers for a long time and evaluate their mental health throughout their careers. Additionally, future research should assess this impact longitudinally because the long-term effects of the fight against the COVID-19 pandemic and the higher demands that were confirmed in this population still appear to be unclear. From a preventive perspective, future studies should investigate protective factors associated with the development and prevalence of PTSD and burnout, such as variables like individual resiliency, social support, coping mechanisms, and organizational support on police officers' mental health.

5. Conclusions

Overall, this study highlights that the struggle against the COVID-19 pandemic has exacerbated the risk of developing PTSD and burnout. This study also emphasizes the power of police institutions to provide a positive organizational climate, thus lessening the long-term impact of job demands and highlighting the need for leadership styles and interventions that promote demand for support services for police officers, and thereby transitioning from a culture that values self-sufficiency and stoicism to a police culture that promotes the overall well-being of its police officers. Unfortunately, this implies a substantial change in police culture, as acknowledging emotional problems is not often encouraged in law enforcement, as it is considered a sign of vulnerability and weakness.

Protecting police officers' mental health with trauma-informed interventions and providing appropriate support is crucial for enabling these professionals to continue effectively protecting and serving communities.

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Informed Consent Statement: Written informed consent was obtained from all individuals involved in the study, who gave their consent to participate in and publish studies.

Data Availability Statement: The data supporting this study's findings are available from the corresponding author, B.S., upon reasonable request.

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