



Assessment of Post-traumatic Stress Disorder Risk Factors Among Law Enforcement Staff: A Case-Control Study

Hossein Rostami¹, Omid R Gorjestani², Kobra Khalilpour³, Zoha Ali², Mina Mahboudi², Hamidreza Ghadimi^{4,*}, Alireza Hasanzadeh², Sara Rostami²

¹ Research Center for Cognitive & Behavioral Sciences in Police, Directorate of Health, Rescue & Treatment, Police Headquarter, Tehran, Iran

² Tehran University of Medical Sciences, Tehran, Iran

³ Department of Psychology, Iranian Hospital, Tehran, Iran

⁴ Qom University of Medical Sciences, Qom, Iran

*Corresponding author: Qom University of Medical Sciences, Qom, Iran. Email: hrgh97@gmail.com

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Abstract

Background: Given the inherent nature of their job, law enforcement staff regularly confront major stressors.

Objectives: The prevalence of post-traumatic stress disorder (PTSD) among law enforcement staff is about twice that of the general population. We conducted this study to assess PTSD risk factors among this population.

Methods: This prospective case-control study was conducted on patients with PTSD working as law enforcement staff as the case group, and their comrades with no PTSD as the control group. We used a questionnaire, including possible factors contributing to the development of PTSD, to gather the data. Binomial logistic regression was used to calculate the odds ratio (OR) and 95% confidence intervals.

Results: A total of 84 participants were included in the study. We found that some factors could be protective against PTSD, including marriage (OR: 0.270, 95% CI: 0.087 - 0.839, P-value: 0.024), having an academic degree (OR: 0.333, 95% CI: 0.114 - 0.978, P-value: 0.045), higher income (R2: 0.081; OR: 0.849, 95% CI: 0.721 - 1.000, P-value: 0.050), and receiving satisfactory family support (OR: 0.413, 95% CI: 0.171 - 0.999, P-value: 0.050). Furthermore, logistic regression showed that a positive psychological history (OR: 2.562, 95% CI: 1.025 - 6.406, P-value: 0.044), a positive familial psychological history (OR: 2.667, 95% CI: 1.099 - 6.406, P-value: 0.030), and encountering trauma (aside from the current trauma) after 18 years of age (OR: 2.643, 95% CI: 1.038 - 6.731, P-value: 0.041) are risk factors for PTSD.

Conclusions: Our results showed that marriage, having an academic degree, higher income, and receiving satisfactory family support are protective factors. In addition, the risk factors for PTSD include a positive psychological history, a positive familial psychological history, and encountering trauma (aside from the current trauma) after 18 years of age. However, given our limitations, further studies should be conducted before drawing solid conclusions.

Keywords: Law Enforcement Officer, Post-traumatic, PTSD, Risk Factors, Stress Disorders

1. Background

Post-traumatic stress disorder (PTSD) is a chronic neuropsychological disorder that can develop after exposure to a traumatic stressor (1). The symptoms can be categorized into intrusive symptoms, avoidance symptoms, negative alterations in mood or cognition, and marked alterations in arousal or reactivity (2).

Given the inherent nature of their job, law enforcement staff regularly confront unpredictable and potentially life-threatening stressors (3). These types of

traumatic incidents can have significant consequences on their psychological and professional capabilities, and in some cases, result in the manifestation of PTSD (3). It has been reported that the prevalence of PTSD in police officers is between 8.0% and 14.2%, which is about twice that of the general population (4, 5). This high prevalence is related to increased errors, aggression, absenteeism, and suicide in this critical occupation (4, 6).

2. Objectives

Despite growing interest in studying risk factors in subgroups and the high burden of PTSD, there are limited reports on PTSD risk factors in law enforcement staff (4). Given the scarcity of data and the importance of risk factor assessment in law enforcement staff with PTSD, we conducted this study.

3. Methods

3.1. Study Design and Setting

This is a prospective case-control study conducted between April 2022 and April 2023 at the psychiatric wards of three hospitals affiliated with the Law Enforcement Command of the Islamic Republic of Iran. Written informed consent was obtained from participants, who were informed that they could leave the study without compromising their relationship with their healthcare provider. The study was performed in accordance with the Declaration of Helsinki and its later amendments. The requirement for approval number (IR.SBMU.TEB.POLICE.REC.1402.027) was waived by the local ethics committee as no interventions were performed. This paper adheres to the strengthening the reporting of observational studies in epidemiology (STROBE) guidelines.

3.2. Participants

All consecutive patients who were referred to these hospitals and diagnosed with PTSD based on a structured clinical interview for the diagnostic and statistical manual of mental disorders (DSM-5) were included in the study. Enrollment criteria included all male patients with PTSD who were employed in law enforcement. Exclusion criteria were experiencing a psychotic state, having a non-psychological mental disorder, suicidal ideation, being unable to participate, and not consenting to participate. The control group was selected from their comrades who were exposed to the major trauma that was the suggested trigger for their disease, in an effort to reduce the effects of different exposures. We randomly chose one comrade if there were more than two staff members at one scene to maintain the 1:1 case-control ratio.

3.3. Variables and Data Source

We obtained the participants' data, including age, marital status, academic education, monthly income, smoking status, past medical history, past psychological history, familial medical history, familial psychological history, age at the time of the current trauma, years of

work experience before the current trauma, childhood trauma [an emotional response to a terrible event like an accident, rape, or natural disaster (7)], adulthood trauma (except for the current trauma; after 18 years old), the time between the current trauma and receiving psychological care, and receiving support from family, colleagues, and society (subjective and from the participant's perspective). All participants filled out the civilian version of the post-traumatic stress disorder checklist (PCL-5), a 20-item self-report tool that exactly matches the diagnostic criteria of PTSD in DSM-5 (8), to assess their symptom severity score. All data were obtained using a self-report questionnaire.

3.4. Statistical Methods

We used IBM SPSS Statistics version 27 to perform the statistical analysis. Categorical variables were reported as frequency (percentage) and compared using the chi-square test. Numerical variables were described by mean and standard deviation. An independent sample *t*-test was used to investigate the relationship between numeric variables. We implemented binomial logistic regression to evaluate the predictive value of each possible variable. The dependent variable was PTSD, and the independent variables were the possible contributing factors. The odds ratio (OR) and 95% confidence interval for each factor were calculated. A *P*-value of less than 0.05 was considered statistically significant.

4. Results

4.1. Demographics

A total of 84 male participants were included in the study (mean age: 36.2 years, SD: 5.5). Half were afflicted with PTSD, and the other half comprised the control group. As shown in Table 1, 77.4% of participants were married, and 76.2% had an academic degree. The mean income of the subjects was 88 million Rials per month (SD: 3.6). Positive past medical history and past psychological history were reported in 19% and 36.9% of the subjects, respectively. Forty-six subjects had a family history of medical conditions, and similarly, 46 participants had a positive family history of psychological disorders. The mean age at the time of trauma and the working years before the trauma were 28.3 years (SD: 7) and 8.9 years (SD: 7.2), respectively. Thirty-four cases encountered trauma before eighteen years of age, and 55 subjects experienced trauma (aside from the current trauma) after eighteen years of age. The mean time between trauma and receiving care was

Table 1. Demographic Data of the Study Participants ^{a,b,c}

Variables	PTSD (N: 42)	Control (N: 42)	Total (N: 84)	P-Value
Age (y)	36.43 ± 6.0	35.9 ± 5.0	36.2 ± 5.5	0.127 ^b
Marital status; single	14 (33.3)	5 (11.9)	19 (22.6)	0.035 ^a
Academic education; yes	28 (66.7)	36 (85.7)	64 (76.2)	0.040 ^a
Income (million Rial)	80 ± 1.7	97 ± 4.7	88 ± 3.6	< 0.001 ^b
Smoking; yes	14 (33.3)	11 (26.2)	25 (29.8)	0.634 ^a
Past medical history; positive	9 (21.4)	7 (16.7)	16 (19)	0.782 ^a
Past psychiatric history; positive	20 (47.6)	11 (26.2)	31 (36.9)	0.042 ^a
Family history; positive	26 (61.9)	20 (47.6)	46 (54.8)	0.188 ^a
Family psychiatric history; positive	28 (66.7)	18 (42.9)	46 (54.8)	0.028 ^a
Age before the trauma (y)	29.1 ± 7.2	27.6 ± 6.8	28.3 ± 7.0	0.455 ^b
Working years before the trauma	10.1 ± 8.0	7.7 ± 6.1	8.9 ± 7.2	0.071 ^b
Trauma before 18-year-old; positive	19 (45.2)	15 (35.7)	34 (40.5)	0.374 ^a
Trauma after 18-year-old; positive	32 (76.2)	23 (54.8)	55 (65.5)	0.039 ^a
Duration of receiving care (months)	4.9 ± 3.1	8.5 ± 5.5	6.7 ± 4.8	< 0.001 ^b
Family support; positive	19 (45.2)	28 (66.7)	47 (56.0)	0.048 ^a
Colleague support; positive	4 (9.5)	11 (26.2)	15 (17.9)	0.085 ^a
Society support; positive	4 (9.5)	3 (7.1)	7 (8.3)	1.000 ^a

Abbreviations: PTSD, post-traumatic stress disorder; N, number; SD, standard deviation.

^a Chi-squared test.

^b Independent-samples *t*-test.

^c Values are expressed as mean ± SD or No. (%).

4.9 months (SD: 3.1) and 8.5 months (SD: 5.5) in the PTSD and control groups, respectively. Forty-seven subjects were satisfied with the support of their family. However, only 17.9% and 8.3% were content with their colleagues' and social support, respectively. The chi-squared test revealed a significant difference between the two groups with respect to marital status, academic education, past and familial psychological history, and familial support. Furthermore, the independent-samples *t*-test showed that the PTSD group had significantly lower income and a longer time to receive care (all *P*-values < 0.05).

4.1. The Relationship Between the Participants' Characteristics and PTSD

Table 2 exhibits the results of logistic regression regarding the relationship between each variable and PTSD. We found that some factors could be protective against PTSD, including marriage (OR: 0.270, 95% CI: 0.087 - 0.839, *P*-value: 0.024), having an academic degree (OR: 0.333, 95% CI: 0.114 - 0.978, *P*-value: 0.045), higher income (R²: 0.081; OR: 0.849, 95% CI: 0.721 - 1.000, *P*-value: 0.050), and receiving satisfactory family support (OR:

0.413, 95% CI: 0.171 - 0.999, *P*-value: 0.050). Furthermore, logistic regression showed that a positive psychological history (OR: 2.562, 95% CI: 1.025 - 6.406, *P*-value: 0.044), a positive familial psychological history (OR: 2.667, 95% CI: 1.099 - 6.406, *P*-value: 0.030), and encountering trauma (aside from the current trauma) after 18 years old (OR: 2.643, 95% CI: 1.038 - 6.731, *P*-value: 0.041) are risk factors for PTSD.

We also found a correlation between the time to receive treatment and the PCL-5 total score in those afflicted with PTSD (R²: 0.782; standardized beta: 0.887; *t*: 12.155; *P*-value < 0.001).

5. Discussion

In this prospective case-control study, we assessed the possible factors that could correlate with PTSD in law enforcement staff. Our results revealed that being married, having a higher income, an academic degree, and family support are protective factors for PTSD. Furthermore, we found that having a history of psychological conditions in individuals or their families and facing other traumas in adulthood could make them susceptible to PTSD after encountering trauma.

Table 2. Logistic Regression Analysis

Variables	OR	Lower 95% CI	Upper 95% CI	P-Value
Age	1.017	0.940	1.100	0.675
Marriage	0.270	0.087	0.839	0.024
Academic degree	0.333	0.114	0.978	0.045
Higher income	0.849	0.721	1.000	0.050
Smoking	1.409	0.550	3.609	0.475
Past medical history	1.364	0.456	4.081	0.579
Past psychiatric history	2.562	1.025	6.406	0.044
Family history	1.787	0.750	4.261	0.190
Family psychiatric history	2.667	1.099	6.468	0.030
Age before the trauma	1.033	0.969	1.100	0.319
Working years before the trauma	1.050	0.984	1.120	0.138
Trauma before 18-year-old	1.487	0.619	3.571	0.375
Trauma after 18-year-old	2.643	1.038	6.731	0.041
Family support	0.413	0.171	0.999	0.050
Colleague support	0.297	0.086	1.024	0.055
Society support	1.368	0.287	6.526	0.694

Abbreviations: OR, odds ratio; CI, confidence interval.

Examining risk factors, particularly those related to the environment and modifiable, offers valuable insights that can inform the development of preventive strategies (9). Post-traumatic stress disorder is distinct from other mental health conditions in that it has a predictable trajectory and typically arises from a specific triggering event. Early symptoms of PTSD may manifest within days of exposure to stress. As a result, emergency care providers and other helpers frequently encounter individuals who have experienced trauma, providing a unique opportunity to identify those at risk and offer preventive measures (2, 10).

The results of the present study supported some factors proposed in previous studies (i.e., lower income, history of psychiatric disorders, and previous trauma); however, we did not find significant differences in other factors (i.e., disease history and adverse childhood events) (11).

5.1. Limitations

Given the drawbacks of the present study, our results must be interpreted cautiously. The study was conducted as an exploratory survey, so we are not able to assess causality. Additionally, we did not have access to data on women afflicted with PTSD, and therefore only male law enforcement staff were included in the study. We had a relatively small sample size, which could be attributed to the low reporting of PTSD among law enforcement staff due to its stigma in Iran; this could negatively affect the study's power. Some results reached

near-significance levels, so increasing the number of subjects could clarify whether they influence PTSD or not. Since the data was acquired using an anonymous self-report questionnaire, we might encounter reporting and recall biases. Due to the high heterogeneity among our cases regarding past medical and familial disorders, we were not able to assess the relationship between the types of diseases and PTSD. Another drawback is the confounding factors mentioned above, which we were not able to include in the study. These limitations might affect the generalizability of the data.

5.2. Conclusions

We found that some variables could be considered protective factors against PTSD, including being married, having a higher income, an academic degree, and family support. On the other hand, a history of psychological conditions in individuals or their families and adulthood trauma could be regarded as risk factors for PTSD. We suggest that the recruitment of law enforcement staff consider these proposed factors. However, given our limitations, further studies should be conducted before drawing solid conclusions.

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Footnotes

Authors' Contribution: Study concept and design: H.R., and O.G.; analysis and interpretation of data: K.K., and Z.A.; drafting of the manuscript: A.H. and M.M.; critical revision of the manuscript for important intellectual content: H.G., S.R. and M.M.; statistical analysis: S.R.

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References

1. Roehr B. American Psychiatric Association explains DSM-5. *BMJ*. 2013;**346**:f3591. [PubMed ID: 23744600]. <https://doi.org/10.1136/bmj.f3591>.
2. Schrader C, Ross A. A Review of PTSD and Current Treatment Strategies. *Mo Med*. 2021;**118**(6):546-51. [PubMed ID: 34924624]. [PubMed Central ID: PMC8672952].
3. Marchand A, Nadeau C, Beaulieu-Prevost D, Boyer R, Martin M. Predictors of posttraumatic stress disorder among police officers: A prospective study. *Psychol Trauma*. 2015;**7**(3):212-21. [PubMed ID: 25793514]. <https://doi.org/10.1037/a0038780>.
4. Syed S, Ashwick R, Schlosser M, Jones R, Rowe S, Billings J. Global prevalence and risk factors for mental health problems in police personnel: a systematic review and meta-analysis. *Occup Environ Med*. 2020;**77**(11):737-47. [PubMed ID: 32439827]. <https://doi.org/10.1136/oemed-2020-106498>.
5. Brewin CR, Miller JK, Soffia M, Peart A, Burchell B. Posttraumatic stress disorder and complex posttraumatic stress disorder in UK police officers. *Psychol Med*. 2022;**52**(7):1287-95. [PubMed ID: 32892759]. <https://doi.org/10.1017/S0033291720003025>.
6. Rajaratnam SM, Barger LK, Lockley SW, Shea SA, Wang W, Landrigan CP, et al. Sleep disorders, health, and safety in police officers. *JAMA*. 2011;**306**(23):2567-78. [PubMed ID: 22187276]. <https://doi.org/10.1001/jama.2011.1851>.
7. Spytka L. Psychological trauma and its impact on a person's life prospects. *Sci Bull Mukachevo State Univ Series Pedagogy Psychol*. 2023;**9**(3):82-90. <https://doi.org/10.52534/msu-pp3.2023.82>.
8. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. *The PTSD checklist for DSM-5 (PCL-5)*. 2013. Available from: <https://www.ohsu.edu/sites/default/files/2022-08/%28PCL-5%29%20PTSD%20Checklist%20for%20DSM5.pdf>.
9. Qi W, Gevonden M, Shalev A. Prevention of Post-Traumatic Stress Disorder After Trauma: Current Evidence and Future Directions. *Curr Psychiatry Rep*. 2016;**18**(2):20. [PubMed ID: 26800995]. [PubMed Central ID: PMC4723637]. <https://doi.org/10.1007/s11920-015-0655-0>.
10. Tortella-Feliu M, Fullana MA, Perez-Vigil A, Torres X, Chamorro J, Littarelli SA, et al. Risk factors for posttraumatic stress disorder: An umbrella review of systematic reviews and meta-analyses. *Neurosci Biobehav Rev*. 2019;**107**:154-65. [PubMed ID: 31520677]. <https://doi.org/10.1016/j.neubiorev.2019.09.013>.
11. Petereit-Haack G, Bolm-Audorff U, Romero Starke K, Seidler A. Occupational Risk for Post-Traumatic Stress Disorder and Trauma-Related Depression: A Systematic Review with Meta-Analysis. *Int J Environ Res Public Health*. 2020;**17**(24). [PubMed ID: 33327657]. [PubMed Central ID: PMC7765156]. <https://doi.org/10.3390/ijerph17249369>.