Risk and protective factors for the development of stress in the Federal Highway Police

Fatores de risco e proteção para o desenvolvimento do estresse na Polícia Rodoviária Federal

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Abstract

Objective
The present study aimed to identify the risk and protective factors for the development of stress in a random and stratified sample of Brazilian federal highway police officers in the state of São Paulo (*N* = 202).

Method
The instruments used were a General Questionnaire (sociodemographic and occupational variables) and Lipp's Stress Symptom Inventory for Adults. The prevalence ratio was used as a measure of association and the independent variables were organized into 8 models and inserted into a logistic regression model.

Results
A stress prevalence of 43.1% (95% CI = 36.2–50.0) was found, with most of the sample in the resistance phase (82.7%). The factors related to stress were leisure, educational level, degree of job satisfaction, low remuneration, suicidal ideations, insomnia, lack of training, and work-family conflict.

Conclusion
The results can influence actions aimed at controlling stress.

Keywords: Cross-sectional studies; Police; Protective factors; Risk factors.

Resumo

Objetivo
O presente estudo objetivou identificar os fatores de risco e proteção para o desenvolvimento de estresse numa amostra aleatória e estratificada de policiais rodoviários federais do estado de São Paulo (N = 202).

Método
Utilizou-se os seguintes instrumentos: Questionário Geral (variáveis sociodemográficas e ocupacionais) e Inventário de Sintomas de Estresse para Adultos de Lipp (ISSL). A razão de prevalência foi utilizada como medida de associação, e as variáveis independentes foram organizadas em 8 modelos e inseridas em um modelo de regressão logística.

Resultados
Foi encontrada a prevalência de estresse de 43,1% (95% IC = 36,2–50,0), com a maioria da amostra na fase de resistência (82,7%). Os fatores relacionados ao estresse foram lazer, formação acadêmica, grau de satisfação com o trabalho, remuneração incompatível, ideação suicida, insônia, falta de treinamento e conflito trabalho-família.

Conclusão
Conclui-se que os resultados podem influenciar em ações que visem controlar o estresse.

Palavras-chave: *Estudos transversais; Polícia; Fatores de proteção; Fatores de risco.*

Hans Selye became one of the leading stress researchers; he presented a model of stress development consisting of three phases, namely: "alert," "resistance," and "exhaustion" (Selye, 1959). Selye's three-phase model remained unchanged until Lipp proposed the four-phase model, consisting of a new phase, intermediate between the "resistance" and "exhaustion" phases, which was called "near exhaustion" (Lipp, 2000, 2003; Lipp & Novaes, 2003).

Police work is extremely stressful andlife-threatening, involving routines that repeatedly expose them to distressing situations, impacting their well-being and mental health (Njiro et al., 2021; Velazquez & Hernandez, 2019). Many studies have distinguished stress among police officers, generally arising from operational and organizational situations, such as: exposure to trauma, dealing with life-threatening situations, budget cuts, team reduction, and exponential increase in daily occurrences (Allen & Zayed, 2019; Davies, 2021), which negatively impact the personal and family life and work performance of these professionals.

In Brazil, most studies that relate stress and police work have analyzed military and civilian police, little is known about the *Polícia Rodoviária Federal* (PRF, Federal Highway Police). From the PRF's broad scope of attributions, it is known that public servants act as a traffic police authority (caring for and supporting users of federal highways in cases of accidents, traffic inspections, among other events), as well as in patrolling roads (ensuring the safety of users and public property) and in actions to prevent, combat, and suppress crime (which includes the trafficking of drugs, weapons, people, wild animals, among other crimes) (Ministério da Justiça, 2021), conditions that expose these professionals to an aversive work environment.

With that in mind, this study aimed to present the results of stress prevalence in a probabilistic and stratified sample of federal highway police officers working in the state of São Paulo, as well as to identify the related risk and protective factors, aiming to increase the number of studies on the conditions of these servants, supporting an emotional care program that meets the needs of this population.

Method

The present research is an epidemiological study, with a cross-sectional design, carried out with a probabilistic sample.

Participants

Composed of 202 federal highway police officers, working in the state of São Paulo, coming from ten regional police stations, in addition to the PRF Headquarters, located in the city of São Paulo.

Instruments

We used the following research instruments: a General Questionnaire (GQ), consisting of 41 questions, for the purpose of characterizing the participant in sociodemographic and occupational terms (sex, leisure, age, educational level, career length, number of children, and having been criminally prosecuted), as well as the characterization of the stress perceived by the participant regarding variables related to the environment and work routines. This measurement was made according to the participant's degree of agreement with statements that characterized each type of work situation, through Likert-type scales, which ranged from 0 (not true) to 10 (true) (e.g.: '' I feel that my work puts my life at risk on a daily basis"). These statements covered the following domains of the participant's professional life: (1) self-perception of life-threatening danger (daily risk of life, risk of life at work), (2) self-perception of job satisfaction (degree of job satisfaction, low remuneration); (3) self-perception of the physical and emotional conditions involved in being a PRF officer (having daily stress, feeling physically or mentally tired after a day at work, having frequent insomnia); (4) self-perception of the working conditions offered by the corporation (availability of material and equipment resources, small teams, lack of support from the institution, lack of training as a police officer, lack of team training, long working hours, period of work, and whether having a good environment would improve the relationship at work); (5) self-perception of the conflict between work and family life (feeling aggressive after joining the corporation, conflicts between work routine and family); (6) self-perception in dealing with situations that could result in critical incidents (dealing with ill-natured people as Law offenders; feeling stress with serious accidents); feeling stress when dealing with fatalities and/or serious injuries; feeling stress with reporting accidents and deaths to family members; death resulting from the performance of their legal duties) and finally (7) reporting their suicidal ideations in the twelve months prior to the interview. Finally, the officer's emotional stress was objectively measured using Lipp's Stress Symptom Inventory for Adults (LSSI), which also identifies the phase and type of predominant symptom (physical or psychological) among people who meet the criteria for stress. The LSSI presents high reliability, with Cronbach's α (Alpha) coefficient values between 0.9083 and 0.9124 (Lipp, 2000).

Procedures

The sample size was calculated using the following parameters: expected proportion of stress of 45%, relative precision of 15%, and confidence level of 5%. For sample selection, we used the random and stratified sampling technique (the police station in which it operated was considered as a stratum) and, for operational convenience, we opted for twenty police officers per stratum. We chose to disclose the results on a consolidated basis, not by stratum – in order to comply with the secrecy requirements. Thus, from a reference list, delivered by the Department of Human Resources of the PRF, the sample components were drawn and then summoned to a meeting, aiming to bring everyone together on the same day and time. On the stipulated date, the selected servants were informed about the purpose of the research and the voluntary character of participation. Servants who were officers and who were allocated in the state of São Paulo were included in the sample. Four police officers who resigned their participation in the research were excluded (justified by feeling tired after 24 hours of work; leaving for a trip; family member hospitalized in the Intensive Care Unit; and, finally, one officer did not feel comfortable participating in the research). Upon consenting to participate, the police officer received the Informed Consent Form and the research instruments. Data collection took place on the premises of the police stations, in rooms or auditoriums, depending on the local infrastructure. The application time ranged from 30 to 50 minutes. If an officer chose

to leave the study or could not participate, new police officers were drawn, and a new date was scheduled.

We used the R3.3.2 software for descriptive and inferential statistical analyses. Initially, we calculated the prevalence of the sociodemographic and occupational characteristics of the sample and, later, we estimated the prevalence of the outcome (stress) and the association with the independent variables (general questionnaire). In this sense, intergroup differences (bivariate analyses) for categorical (qualitative) variables were estimated using the chi-square or Fisher's test. Integral differences (bivariate analyses) for numeric variables (quantitative) were evaluated using the Student's t-test (for variables with normal distribution) and the Mann-Whitney test (for variables with non-normal distribution). The normal distribution (or not) of numeric variables was evaluated using the Shapiro-Wilk test.

Subsequently, the variables that reached statistical significance in the bivariate analyzes ($p \le 0.05$) were separated into eight multiple regression models (divided according to the nature of the variables, that is, whether sociodemographic, occupational, or self-perceived stress, as described in the item about the instruments used in this study, illustrated in Table 1) to identify the explanatory variables related to the outcome (stress; LSSI). At this level of analysis, the explanatory variables of the outcome were identified after controlling for the confounding effect arising from the sociodemographic variables. The association between the variables was measured using the Prevalence Ratio (PR). The adequacy of the adjustment was evaluated through the analysis of residues, as well as through the evaluation of multicollinearity between the variables through the Variance Inflation Factor coefficient. In all cases, the null hypothesis was rejected for p-value less than or equal to 0.05 ($p \le 0.05$).

Table 1
Distribution of variables in relation to the models to be verified in the logistic regression

Models	Characterization	Variables
V1	Sociodemographic	Sex Leisure Age (or career length)* Having been criminally prosecuted Children Educational level
V2	Suicidal ideations	Suicidal ideations (last 12 months)
V3	Self-perception of life-threatening danger	Daily risk of life Risk of life caused by the profession
V4	Self-perception regarding job satisfaction	Degree of job satisfaction Low remuneration
V5	Self-perception of the physical and emotional conditions of being a Federal Highway Police	Daily stress Physical fatigue after working day Mental fatigue after working day Frequent insomnia
V6	Self-perception of the job conditions offered by the corporation	Scarce material and equipment resources x quality of work Reduced team Lack of support from the institution Lack of training as a police officer Lack of staff training Working day Working hours Good working environment improves relationship at work
V7	Self-perception of the conflict between work and family life	Aggressive after joining the Federal Highway Police Work routine x family
V8	Self-perception in dealing with situations that can result in critical incidents (acute stress)	Dealing with ill-natured people as Law offenders Stress with serious accidents Stress with fatalities and/or serious injuries Stress caused by reporting accidents and deaths to family members Death resulting from the performance of their legal duties

Note: *Either one or the other was used because when tested jointly in the model, there was multicollinearity in the Variance Inflation Factor coefficient.

To carry out this study, the ethical standards that control research involving human beings were observed; we assured participants that their personal data would be kept confidential. The Ethics Committee of the Faculdade de Medicina da Universidade de São Paulo (Faculty of Medicine of the University of São Paulo) approved the study, under n° 114/19 and by the General Manager of the PRF, process nº. 238/2012.

Results

Sociodemographic Characteristics

The predominant profile identified for the sample was: male (93.1%); median age 43; being married or in a stable union (82.2%); having children (76.3%); having a college degree (85.6%); having time for leisure activities (86.6%); and residing in the same location as their work (51.5%). Professionally, the predominant profile comprised individuals: with a median career length of 15 years; performing an operational function (62.4%); working on a shift schedule (69.4%), day and night (73.3%); and not performing any other professional activities (94%). Finally, 82.2% of the professionals reported never having been criminally prosecuted.

Descriptive Data on Stress

According to the LSSI results, we estimate that 43.1% (95% CI = 36.2–50.0) of the police officers ($N = 87$) were experiencing stress at the time of the interview. Of these, 2.3% (95% CI = 0.2–8.0) were in the "alert" phase; 82.7% (95% CI = 73.2–90.0) in "resistance"; 11.5% (95% CI = 5.7–20.1) in "near exhaustion" and 3.5% (95% CI = 0.7–9.7) in "exhaustion." As for the type of symptom, 60.9% (95% CI = 49.9–71.2) of the individuals manifested a predominance of psychological stress, 33.3% of physical stress (95% CI = 23.6–44.3%), and 5.8% (95% CI = 1.9–12.9) both (*).

The results of the associations between the sociodemographic and outcome categorical variables (stress; LSSI) are shown in Table 2. The association of the outcome was identified only with the leisure variable; in this sense, having time set aside for leisure reduced the prevalence of emotional stress symptoms among police officers by 40% (PR = 0.6; 95% CI = 0.4–0.8).

Results of associations between numeric and outcome variables (stress; LSSI) are shown in Table 3. Participants who had stress symptoms were younger than their colleagues without stress ($p = 0.05$). Additionally, officers who did not present stress symptoms reported a higher degree of satisfaction with their professional activity ($p < 0.001$).

The relationship between categorical occupational variables and the outcome (stress; LSSI) is shown in Table 4. Having thought about suicide in the (12) twelve months prior to the interview increased the prevalence of stress by almost 80% (PR = 1.8; CI 95% = 1.2–2.5).

The relationship between the variables of self-perception of stress (in the face of routine work situations) and the outcome (stress; LSSI) is shown in Table 5. In this sense, the police officers categorized as "stressed," according to the LSSI, evaluated all situations in the routine life of the police as stressful, except for the variable "good work environment improves relationship at work".

The results of the logistic regressions performed for the stress outcome (LSSI) are described in Table 6, separated according to the model. Thus, controlling for the effects of sociodemographic variables, we identified the following results: (a) in Model 2, we identified that the variable "having

Table 2

Distribution of categorical (qualitative) risk/protection variables in a sample (n = 202) of federal highway police officers in the State of São Paulo (2014-2015), according to their state of stress (LSSI)

Variables	Stress				p-value	PR	95% CI
	No		Yes				
	n	%	n	%			
Sex							
Female	6	42.9	8	57.1	0.28	1	
Male	109	58.0	79	42.0		0.7	[0.5–1.2]
Marital status							
With spouse	95	57.2	71	42.8	0.9	1	
Without spouse	20	55.6	16	44.4		1.0	[0.7–1.6]
Children							
No	24	51.1	23	48.9	0.4	1	
Yes	89	58.9	62	41.1		0.8	[0.6–1.2]
Educational level							
Sp/Mt/Dt	14	70.0	6	30.0	0.3	1	
ES-MS/HS	14	48.3	15	51.7		1.7	[0.8–3.7]
College degree	87	56.9	66	43.1		1.4	[0.7–2.9]
Leisure							
No	9	33.3	18	66.7	0.01	1	
Yes	106	60.6	69	39.4		0.6	[0.4–0.8]

Note: p-value was obtained by the chi-square test or Fisher's test. CI: Confidence Interval; ES-MS/HS: Elementary school-Middle school/High school; PR: Prevalence Ratio; Sp/Mt/Dt: Specialization/Master's/Doctorate.

Table 3

Descriptive measures for numerical (quantitative) variables of the general questionnaire according to stress (LSSI) in a sample (n = 202) of federal highway police officers in the State of São Paulo (2014-2015)

Variables	Stress										p-value
	No					Yes					
	M	SD	Q50	Q25	Q75	M	SD	Q50	Q25	Q75	
Age range	42.8	6.6	43.0	38.0	47.5	42.1	7.4	42.0	36.0	48.0	0.05**
Career time	13.2	6.8	15.0	8.0	20.0	13.6	7.7	15.0	9.0	20.0	0.50*
Degree of Satisfaction	7.6	1.8	8.0	7.0	9.0	6.5	2.0	7.0	5.5	8.0	< 0.001*

Note: The verification of the normal distribution of variables was performed using the Shapiro-Wilk test. For parametric variables, p-value was obtained by t-Student(**); for non-parametric variables (not from normal distribution), the Mann-Whitney test (*) was used. Q50: Median; Q25: Quartile 25%; Q75: Quartile 75%, p-value in bold equals significant result.

Table 4

Distribution of occupational variables in relation to the stress outcome (LSSI) in a sample (n = 202) of federal highway police officers in the State of São Paulo (2014-2015)

1 of 2

Variables	Stress				p-value	PR	95% CI
	No		Yes				
	n	%	n	%			
Place of residence x work							
No	55	56.1	43	43.9	0.9	1	
Yes	60	57.7	44	42.3		0.9	[0.7–1.3]
Role							
Administrative	28	54.9	23	45.1	0.7	1	
Special group	12	50.0	12	50.0		1.1	[0.7–1.8]
Operational	74	58.7	52	41.3		0.9	[0.6–1.3]
Working hours							
Daily (8–12 hours)	29	58	21	42	0.6	1	
Shifts	81	57.9	59	42.1		1.0	[0.7–1.5]
Other	5	41.7	7	58.3		1.4	[0.8–2.5]

Table 4

Distribution of occupational variables in relation to the stress outcome (LSSI) in a sample (n = 202) of federal highway police officers in the State of São Paulo (2014-2015)

Variables	Stress				p-value	PR	95% CI
	No		Yes				
	n	%	n	%			
Working period							
Day and nighttime	86	58.1	62	41.9	0.6	1	
Daytime only	29	53.7	25	46.3		1.1	[0.8–1.6]
Exclusive dedication							
No	107	56.6	82	43.4	0.6	1	
Yes	8	66.7	4	33.3		0.8	[0.3–1.7]
Feeling grief at work							
Has never had	12	52.2	11	47.8	0.7	1	
Has had	103	57.5	76	42.5		0.9	[0.6–1.4]
Death resulting from the performance of their legal duties							
No	91	56.5	70	43.5	0.9	1	
Yes	24	58.5	17	41.5		0.9	[0.6–1.4]
Risk of life at work							
No	14	63.6	8	36.4	0.6	1	
Yes	101	56.1	79	43.9		1.2	[0.7–2.1]
Having been criminally prosecuted							
Has never been	97	58.4	69	41.6	0.4	1	
Has been	18	50	18	50		1.2	[0.8–1.7]
Suicidal ideations (last year)*							
Has never had	110	59.8	74.0	40.2	0.002	1	
Has had	5	29.4	12.0	70.6		1.8	[1.2–2.5]

Nota: The *p*-value was obtained by the chi-square test or Fisher's test. *This item is part of the general questionnaire: characterization of the level of stress: perception within the work environment, however, for reasons of organization/presentation of the data, it was placed next to this table. CI: Confidence Interval; PR: Prevalence Ratio.

Table 5

Descriptive measures for self-perception of stress in routine police situations, according to stress symptoms (LSSI) in a sample (n = 202) of federal highway police officers in the State of São Paulo (2014-2015)

Variables	Stress										p-value*
	No					Yes					
	M	SD	Q50	Q25	Q75	M	SD	Q50	Q25	Q75	
Daily risk of life	7.3	2.5	8.0	5.0	10.0	8.3	2.2	9.0	7.5	10.0	**0.002**
Daily stress	4.6	2.8	5.0	2.5	6.5	7.0	2.2	7.0	5.0	9.0	**< 0.001**
Stress routine	5.0	2.8	5.0	3.0	7.0	7.1	2.4	8.0	5.0	9.0	< 0.001
Physical fatigue after working day	7.0	2.8	8.0	5.0	9.0	8.5	1.9	9.0	8.0	10.0	**< 0.001**
Mental fatigue after work period.	6.7	2.7	7.0	5.0	9.0	8.2	1.9	9.0	7.0	10.0	**< 0.001**
Frequent insomnia	3.2	3.3	2.0	0.0	5.0	5.8	3.6	6.0	2.0	9.5	**< 0.001**
Aggressive after joining the PRF	3.5	3.2	3.0	0.5	6.0	5.8	3.5	7.0	3.0	8.0	**< 0.001**
Work routine x family	3.2	3.2	2.0	0.0	5.0	6.4	3.0	7.0	5.0	8.5	**< 0.001**
Scarce material resources and equipment x quality of work	6.2	3.0	7.0	4.0	9.0	7.1	2.9	8.0	5.0	9.5	**0.028**
Reduced team	8.9	2.0	10.0	8.0	10.0	9.4	1.4	10.0	9.5	10.0	**0.028**
Good working environment improves relationship at work	6.6	2.6	7.0	5.0	9.0	6.1	2.6	6.0	4.5	8.0	0.135
Police work is life-threatening	6.8	3.0	7.0	5.0	10.0	8.1	2.7	9.0	7.5	10.0	**< 0.001**
Lack of support from the institution	6.1	2.8	6.0	4.0	8.0	7.4	2.3	8.0	6.0	9.0	**0.001**
Lack of training as a police officer	6.0	2.9	6.0	5.0	8.0	7.3	2.5	8.0	6.0	9.0	**0.001**
Lack of staff training	6.5	2.6	7.0	5.0	8.0	7.2	2.6	8.0	6.0	9.0	**0.025**

Table 5

Descriptive measures for self-perception of stress in routine police situations, according to stress symptoms (LSSI) in a sample (n = 202) of federal highway police officers in the State of São Paulo (2014-2015)

| Variables | Stress | | | | | | | | | | p-value[*] |
| | No | | | | | Yes | | | | | |
	M	SD	Q50	Q25	Q75	M	SD	Q50	Q25	Q75	
Dealing with ill-natured people as lawbreakers	4.9	3.1	5.0	2.0	7.5	7.2	2.8	8.0	5.0	10.0	**< 0.001**
Stress with serious accidents	3.9	2.9	4.0	1.0	6.0	6.2	3.1	7.0	5.0	9.0	**< 0.001**
Stress with fatalities and/or serious injuries	3.9	3.0	3.0	1.5	6.0	6.2	3.2	7.0	5.0	9.0	**< 0.001**
Stress in reporting accidents anddeaths to family members	4.4	2.9	5.0	2.0	7.0	6.4	3.0	7.0	4.5	9.0	**< 0.001**
Low remuneration	7.0	2.8	7.0	5.0	9.5	7.8	2.3	8.0	6.5	10.0	**0.032**

Note: [*]p-value in bold equals significant result. The verification of the normal distribution of variables was performed using the Shapiro-Wilk test. For parametric variables, p-value was obtained by t-Student; for non-parametric variables (not from normal distribution), the Mann-Whitney test was used. Q50: Median; Q25: Quartile 25%; Q75: Quartile 75%.

had suicidal ideations in the last twelve months" (Yes/No type) emerged as a risk factor for stress among servants (p-value = 0.031, coef. +1.346); (b) in Model 3, the participant's perception of life-threatening danger they face daily as part of their police role did not interfere with the level of stress; (c) in Model 4, the variables "degree of job satisfaction" and "remuneration incompatible with the role" interfered with the outcome as follows: the lower the "degree of job satisfaction" (p-value = 0.001, coef. -1.31) and the greater the perception of "remuneration incompatible with the role" (p-value = 0.012, coef. +0.166) the greater the probability of stress; (c) in Model 5, the variable "insomnia" interfered with the outcome as follows: the higher the level of insomnia (p-value = 0.0021, coef. +0.156), the greater the probability of stress; (d) in Model 6, the variable "lack of training as a police officer" interfered with the outcome as follows: the greater the perception of "lack of training as a police officer" (p-value = 0.011, coef. +0.288), the greater the probability of stress; (e) in Model 7, the variable "participant's perception that being an officer interferes in family life" interfered as follows: the greater this perception of interference (p-value < 0.001, coef. +0.308) the greater the probability of stress; (f) Model 8: self-perception variables in dealing with situations that can result in critical incidents (acute stress) were not related to stress.

Regarding the sociodemographic variables, we observed that the leisure and educational level variables remained in some models, as follows: (a) the leisure variable remained in all models, and can be considered as a protective factor against stress, except when included with the variable "self-perception of the conflict between work and family life," when it lost significance; (b) the educational background variable interfered with the outcome as follows: the higher the educational background, the less likely the officer was to developing stress (V4 – p-value = 0.018, coef. +1.698; V8 – p-value = 0.023, coef. +1.662).

Discussion

The prevalence of stress (LSSI) of 43.1% that we identified in this study, with 2.3% of participants in the "alert" phase, 82.7% in the "resistance" phase, 11.5% in the "almost exhaustion" and 3.5% (95% CI = 0.7–9.7) in the "exhaustion" phase was compatible with previous studies carried out in Brazil: in the city of Natal, 47.4% (N = 264) of military police officers met the stress criteria (Costa et al., 2007), as well as 38.4% of federal police officers (Rossetti et al., 2008) and 43% of high-ranking police officers (Lipp, 2009) in the city of São Paulo. In addition, another study carried out in five different states found that 43% to 57% of high-ranking police officers met the stress criteria (Lipp, 2016).

Table 6

Logistic regression results for the Stress outcome (LSSI) in a sample (n = 202) of federal highway police officers in the state of São Paulo (2014-2015)

1 of 2

Variables	Sociodemographic (V1)		Model 2 (V1+ V2)		Model 3 (V1+ V3)		Model 4 (V1+ V4)		Model 5 (V1+ V5)		Model 6 (V1+ V6)		Model 7 (V1+ V7)		Model 8 (V1+ V8)	
	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
V1 - Sociodemographic																
Sex (Male)	-0.44	0.464	-0.537	0.372	-0.518	0.401	-0.463	0.458	-0.282	0.675	-0.468	0.461	-0.538	0.417	-0.35	0.592
Leisure (yes)	-1.255	**0.006**	-1.142	**0.013**	-1.222	**0.009**	-1.114	**0.02**	-1.006	**0.041**	-1.211	**0.012**	-0.636	0.207	-1.451	**0.004**
Age range	-0.006	0.807	0.00	0.986	0.002	0.924	-0.005	0.862	-0.001	0.977	-0.004	0.89	0.031	0.282	0.007	0.788
Having been criminally prosecuted	0.659	0.097	0.562	0.165	0.522	0.197	0.615	0.134	0.29	0.505	0.582	0.17	0.05	0.911	0.314	0.473
Children (yes)	-0.55	0.176	-0.621	0.132	-0.733	0.083	-0.46	0.286	-0.727	0.104	-0.606	0.165	-0.837	0.07	-0.681	0.128
Educational level (E-M/H)	1.167	0.070	1.054	0.107	0.977	0.143	1.698	**0.018**	1.203	0.093	1.358	0.051	1.27	0.084	1.662	**0.023**
Educational level (college degree)	0.523	0.321	0.514	0.336	0.448	0.415	0.742	0.197	0.418	0.467	0.46	0.413	-0.538	0.417	0.786	0.172
V2 –Suicidal ideations																
Suicidal ideations (last 12 months)			1.346	**0.031**												
V3 - Self-perception of life-threatening danger																
Daily risk of life					0.11	0.264										
Police work is life-threatening					0.088	0.292										
V4 - Self-perception regarding job satisfaction																
Degree of job satisfaction							-0.31	**0.001**								
Low remuneration							0.166	**0.012**								
V5 - Self-perception of the physical and emotional conditions of being a Federal Highway Police																
Stressful routine									0.164	0.051						
Physical fatigue after working day									0.037	0.731						
Mental fatigue after working day									0.037	0.757						
Recurrent insomnia									0.156	**0.002**						
V6 - Self-perception of the job conditions offered by the corporation																
Material resources -scarce equipment x quality of work											-0.038	0.578				
Reduced team											0.001	0.996				
Lack of support from the institution											0.145	0.062				

Table 6

Logistic regression results for the Stress outcome (LSSI) in a sample (n = 202) of federal highway police officers in the state of São Paulo (2014-2015)

Variables	Sociodemographic (V1)		Model 2 (V1+ V2)		Model 3 (V1+ V3)		Model 4 (V1+ V4)		Model 5 (V1+ V5)		Model 6 (V1+ V6)		Model 7 (V1+ V7)		Model 8 (V1+ V8)	
	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
V6 - Self-perception of the job conditions offered by the corporation																
Lack of training as a police officer											0.288	**0.011**				
Lack of staff training											-0.157	0.16				
V7 - Self-perception of the conflict between work and family life																
Aggressive after joining the PRF													0.003	0.96		
Work routine x family													0.308	**<0.001**		
V8 -Self-perception in dealing with situations that can result in critical incidents (acute stress)																
Dealing with ill-natured people as Lawoffenders															0.132	0.066
Stress with serious accidents															0.087	0.465
Stress with fatalities and/ or serious injuries															0.094	0.411
Stress in reporting accidents and deaths to family members															0.035	0.688

Note: E-M/H: elementary or middle school/ high school; Coef.: Coefficient; PRF: Polícia Rodoviária Federal (Federal Highway Police). Values in bold the results were significan.

According to Lipp, individuals remain efficient in their tasks when in the stress resistance phase (sometimes even in a process of great productivity), however, after this moment, they tend to get ill, suggesting that people in this situation need help. However, when the person reaches the stage of exhaustion, they succumb and lose the ability to homeostasis, getting ill (Lipp, 2000, 2003; Lipp & Novaes, 2003; Lipp & Tanganelli, 2002). Therefore, it is concerning that when federal highway police officers get ill, they cause significant losses to their work environment, as verified in the study that associated high anxiety with the inaccuracy of shots fired by American police officers (Nieuwenhuys & Oudejans, 2011), or even research that related the loss of skills such as risk assessment, cognition, and quick decision-making skills, as well as anger control (among others) among workers with mental health impairments (Boland & Salami, 2021; Regehr & Le Blanc, 2017)

By raising risk and protective factors related to stress, we identified that police officers who reported performing regular recreational activities have a lower risk of developing stress. However, this variable loses its protective effect in the presence of self-perception variables on the conflict between work and family life; that is, when police officers think that their family life is being hampered by their profession, leisure is not able to exert the protective effect of before, possibly because family members are involved in these recreational activities. In the literature, it is observed

that most studies have related stress to physical activities (and these are always very positive for the relief of this symptom), however, few studies have associated leisure as an activity that mitigates the stress outcome among police officers, being in line with the following studies: one carried out in Mexico, which concluded that recreational activities and sports activities have a protective effect against stress (García-Rivera et al., 2020); an American research that related leisure activities with stress (Fekedulegn et al., 2018); and finally, one study conducted in Greece, where the lack of leisure with family and/or friends emerged as a risk factor for stress (Galanis et al., 2018).

Also, in this study, we found that the educational level of the police officer also emerged as a protective factor against stress, even in the presence of variables such as self-perception in relation to job satisfaction and self-perception in dealing with situations that can result in critical incidents/stress acute. In this sense, it is understood that by improving their educational level (specialization, master's, and doctorate), officers will be favoring the self-perception they have about their relationships with their work, as well as being better equipped to deal with situations that can cause acute stress in their profession. A survey carried out with the general population pointed out that study time positively interferes with stress control (Krause, 2019). However, when it comes to the police universe, research differs; some studies found that the higher the police officer's educational level, the greater the expectation with the job, which could lead to frustration and stress; on the other hand, other studies corroborate our results, such as the analysis carried out by the Mid-Atlantic state police agency (USA), which found that having a college degree works as a protector for the development of stress (Griffin & Sun, 2018).

Another factor associated, in the literature, with the lives of police officers is the presence of suicidal ideations. The result we found corroborates other studies that concluded that having ideations is a risk factor for stress (Blažina, 2017; Griffin & Sun, 2018; Mushwana et al., 2019).

As for self-perception in relation to job satisfaction, we found that the lower the degree of job satisfaction and the greater the feeling that the remuneration is incompatible with the role performed, the more exposed the police officer is to stress. The same result was found in a study carried out in India about motivation, in which having low remuneration interferes with the degree of satisfaction and, the lower the degree of satisfaction, the greater the chance of police officers having mental suffering, generating greater stress (Maurya & Agarwal, 2018).

Regarding the variables on physical and emotional conditions of being a police officer, we found that the insomnia variable interfered with the police officer's stress levels. The same result was found in the Buffalo Cardio-Metabolic Occupational Police Stress study (Ma et al., 2019), which related low cortisol levels and poor sleep quality, exposing police officers to the development of stress (Fekedulegn et al., 2018). Still in this sense, two other systematic reviews of the literature associated that: workers who are exposed to situations of violence were more exposed to sleep problems and stress (Magnavita et al., 2019) and that sleep problems, among police officers, are associated to the increased risk of having symptoms of stress (Garbarino et al., 2019)

Regarding the variables related to the working conditions offered by the corporation, the greater the police officer's feeling of not being prepared for work, the greater the possibility of them developing stress. In the literature, this same situation was verified in teams that worked in disaster situations; when these are more effectively prepared, the chances of developing post-traumatic stress disorder decrease (Kamijo et al., 2020).

Finally, we observed that the greater the perception that work interferes with family life, the greater the probability of the police officer developing stress. This same situation was found in the research carried out with mid-Atlantic police officers (USA); when police officers realized that

their role caused conflicts within family life, the greater the stress and the greater the damage in the lives of these individuals (Griffin & Sun, 2018). Or the research that stated that work-family conflict is negatively related to police life satisfaction (Liu et al., 2019).

Conclusion

Understanding stress enables actions aimed at preventing and promoting police health, both physically and emotionally. By providing this care, the benefit will happen at the individual level, extending to their families and the way this officer will relate to society. Thus, society will be able to count on more qualified public servants, confident in making decisions, with the right physical and mental skills to carry out their activities with aptitude.

This research reflects only a picture of the situation, without being able to infer causal relationships.

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