



FACTORS ASSOCIATED WITH DEPRESSION ANXIETY AND STRESS IN THE CONTEXT OF COVID-19 PANDEMIC IN POLICE OFFICERS OF METROPOLITAN LIMA, PERU

FACTORES ASOCIADOS A DEPRESIÓN, ANSIEDAD Y ESTRÉS EN EL CONTEXTO DE LA PANDEMIA POR COVID-19 EN POLICÍAS DE LIMA METROPOLITANA, PERÚ

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ABSTRACT

Objectives: To determine the factors associated with the development of depression, anxiety and stress in the context of the COVID-19 pandemic in police officers in Lima, Peru. **Methods:** Analytical cross-sectional study conducted in 210 police officers who were administered the Depression Anxiety and Stress Scale-21 (DASS-21) in October 2020, as well as a form, via Google Forms, to obtain sociodemographic and clinical data. A bivariate and a multivariate analysis were performed using crude and adjusted prevalence ratios, with a confidence interval >95% and a significance level of $p \leq 0.05$. **Results:** Depression, anxiety and stress prevalence rates were 11.43%, 10% and 7.62%, respectively. In the bivariate analysis, anxiety was associated with the number of children (cPR:3.18; 95% CI [1.10-9.17]; $p:0.032$) and history of disease (cPR:2.50; 95%CI[1.08-5.75]; $p:0.031$). For depression and stress, no significantly associated factors were found. In the multivariate analysis, an association between depression and age (aPR:2.50; 95%CI[1.02-6.10]; $p:0.044$) was found, as well as an association between stress and emotional situation (aPR:3.10; 95%CI[1.08-8.95]; $p:0.034$), COVID-19 diagnosis (aPR:3.18; 95%CI[1.02-9.92]; $p:0.045$) and history of disease (aPR:4.19; 95%CI[1.22-14.36]; $p:0.022$). **Conclusions:** A low prevalence of depression, anxiety and stress was observed in the study population. In addition, according to the multivariate analysis, the risk factors for stress were being single, having been diagnosed with COVID-19 and having a history of disease, while being 40 years old or younger was a risk factor for depression.

Key words: Mental Health; Depression; Anxiety; Psychological Stress; Police; COVID-19 (source: MeSH NLM).

RESUMEN

Objetivos: Determinar los factores asociados al desarrollo de depresión, ansiedad y estrés en el contexto de la pandemia por COVID-19 en policías de Lima, Perú. **Métodos:** Estudio transversal analítico realizado en 210 policías a quienes se les aplicó la Escala de Depresión, Ansiedad y Estrés -DASS-21 en octubre de 2020, así como un formulario vía Google Forms para obtener datos sociodemográficos y clínicos. Se realizó análisis bivariado y multivariado, utilizando razones de prevalencia crudas y ajustadas, con un intervalo de confianza >95% y un nivel de significancia de $p \leq 0.05$. **Resultados:** Las prevalencias de depresión, ansiedad y estrés fueron 11.43%, 10% y 7.62%, respectivamente. En el análisis bivariado, la ansiedad se asoció con el número de hijos (RPC:3.18; IC95% [1.10-9.17]; $p:0.032$) y comorbilidades (RPC:2.50; IC95% [1.08-5.75]; $p:0.031$). Para depresión y estrés no se encontraron factores asociados significativamente. En el análisis multivariado se encontró una asociación entre depresión y edad (RPa:2.50; IC95%[1.02-6.10]; $p:0.044$), y entre estrés y situación sentimental (RPa:3.10; IC95%[1.08-8.95]; $p:0.034$), diagnóstico de COVID-19 (RPa:3.18; IC95%[1.02-9.92]; $p:0.045$) y comorbilidades (RPa:4.19; IC95%[1.22-14.36]; $p:0.022$). **Conclusiones:** Se observó una baja prevalencia de depresión, ansiedad y estrés en la población de estudio. Además, según análisis multivariado, los factores de riesgo de estrés fueron: ser soltero, haber sido diagnosticado con COVID-19 y tener comorbilidades, mientras que tener 40 años o menos fue un factor de riesgo de depresión.

Palabras clave: Salud mental; Depresión; Ansiedad; Estrés psicológico; Policía; COVID-19 (fuente: DeCS BIREME).

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Cite as: Katherine Danae Apaza-Llantoy, Lucy Elena Correa-López. Factors associated with Depression Anxiety and Stress in the context of COVID-19 pandemic in police officers of Metropolitan Lima, Peru. Rev. Fac. Med. Hum. October 2021; 21(4): 809-818. DOI 10.25176/RFMH.v21i4.4227

INTRODUCTION

Police have a difficult job ahead of them because of the COVID-19 pandemic. This could affect their physical and mental health⁽¹⁾, affecting their job performance through exposure to high-impact psycho-emotional and psychosocial situations.

In December 2019, cases of pneumonia caused by the novel coronavirus were reported in China and the outbreak spread rapidly becoming a global threat⁽²⁾. By January 2020, the World Health Organization (WHO) has identified COVID-19 as a global public health emergency⁽³⁾.

Therefore, in order to curb the rapid rise in contagion figures, police personnel have the role of enforcing government provisions of confinement and social distancing, although sometimes people hinder their police work, through threats of violence and lack of public support, this situation could affect their mental health⁽¹⁾. A meta-analysis study conducted during the current pandemic in police officers from 24 countries in Europe and North America, showed prevalence of depression, anxiety and stress of 14.6%, 9.6% and 14.2%⁽⁴⁾. In Peru, a study conducted on traffic police officers during the pandemic showed levels of depression and anxiety of 19.6% and 17.3%⁽⁵⁾, which would favor the development of other psycho-emotional disorders such as stress. Due to exposure to SARS CoV-2 virus and respect for social distancing⁽⁶⁾, psycho-emotional disorders have occurred in the mental health of many police officers^(1,4,6). Taking into account the above, the present study seeks to determine the factors associated with the development of depression, anxiety and stress in the context of the COVID-19 pandemic in police officers in Lima, Peru.

METHODS

Design and field of study

Analytical cross-sectional study carried out in police officers of the National Police of Peru (PNP) residing in Lima who met the following inclusion criteria: being active police officers of the PNP, using weapons in the performance of their duties, and agreeing to participate in the study voluntarily. Police officers who were part of the institution's health personnel were excluded.

Population and sample

An initial sample of 216 policemen was obtained by snowball sampling, of which 6 were excluded for

not having filled out the measurement instrument completely, so that 210 participants were finally included. The statistical power for the relationship between depression and COVID-19 was 29.2%, while for anxiety and COVID-19 it was 20.8%, and for stress and COVID-19 it was 43.4%.

Variables and instruments

The Depression, Anxiety and Stress Scale-21 (DASS-21) (7) was applied in October 2020; after completing the DASS-21 scale, using a form designed by the authors and sent through the Google Forms platform, the following sociodemographic and clinical data were collected: age, sex, relationship status (with or without a partner), number of children, diagnosis of COVID-19. The variable comorbidities was composed by "yes" or "no", and if yes, the disease was specified. The categorization of the number of children and age was based on mental health history⁽⁸⁾; there were no older adult subjects.

The measurement of the main variables was performed with the DASS-21 Scale(7), which has three subscales: depression (questions: 3, 5, 10, 13, 16, 17 and 21), anxiety (questions: 2, 4, 7, 9, 15, 19 and 20) and stress (questions: 1, 6, 8, 11, 12, 14 and 18), which are evaluated separately. The cut-off points used for stress are 8-9 (mild stress), 10-12 (moderate stress), 13-16 (severe stress) and 17-21 (extremely severe stress); for anxiety they are 4 (mild anxiety), 5-7 (moderate anxiety), 8-9 (severe anxiety) and 10-21 (extremely severe anxiety); and for depression they are 5-6 (mild depression), 7-10 (moderate depression), 11-13 (severe depression) and 14-21 (extremely severe depression). Positive stress is considered to be present at 8 points or more, positive anxiety at 4 points or more, and positive depression at 5 points or more. The instrument has a total Cronbach's alpha of 0.90 and the values for each subscale are $\alpha_{depression}=0.85$, $\alpha_{anxiety}=0.72$ and $\alpha_{stress}=0.79$ ⁽⁷⁾.

Statistical analysis

Descriptive analysis of the data was performed using frequency tables and percentages. A bivariate and a multivariate analysis were performed, obtaining raw and adjusted prevalence ratios, with a confidence interval > 95% and a significance level of $p \leq 0.05$. In the multivariate analysis, those with statistically significant association in the bivariate analysis were included, and generalized linear Poisson family models and robust variances were used. All statistical analyses were performed using SPSS version 25 and STATA version 16.1.



Ethical aspects

This research was approved by the Research Ethics Committee of the Faculty of Human Medicine of the Ricardo Palma University as stated in the minutes PG-30-2020 (approved on October 24, 2020). In addition, the ethical principles of biomedical research on human subjects of the Declaration of Helsinki 2013 (9) were taken into account and informed consent was obtained from all participants prior to the application of the questionnaires.

RESULTS

In the present study, the prevalence of the variables depression, anxiety and stress were 11.43%, 10% and 7.62%. Table 1 shows that 54.76% of the participants were older than 40 years and 69.05% were male. In addition, 40.95% of the policemen had a positive diagnosis of COVID-19 infection.

Table 1. General characteristics of police officers in Lima, Peru.

Variable	Frecuency (n=210)	Percentage (%)	
Age			
Middle adulthood (more than 40 years old)	115	54.76	
Early adulthood (less than or equal to 40 years old)	95	45.24	
Sex			
Male	145	69.05	
Female	65	30.95	
Relationship status			
Single	74	35.24	
Married	136	64.76	
Number of Children			
0	38	18.10	
1	52	24.76	
2	61	29.05	
3 or more	59	28.10	
COVID-19			
Yes	86	40.95	
No	124	59.05	
Number of COVID-19 Diagnosis			
Twice or more	13	15.12	
Once	73	84.88	
Comorbidities			
Yes	Asthma	4	1.91
	Diabetes mellitus	4	1.91
	Gastritis	5	2.38
	Hyper/hypothyroidism	3	1.43
	Arterial hypertension	7	3.33
	Obesity	2	0.95
	Other	10	4.76
No	175	83.33	

Depression		
Yes	24	11.43
No	186	88.57
Anxiety		
Yes	21	10.00
No	189	90.00
Stress		
Yes	16	7.62
No	194	92.38

The frequencies of depression, anxiety and stress are shown in Table 2, according to the levels: normal, mild, moderate, severe and extremely severe; where it is evident that the highest percentage within the group that presented psycho-emotional symptomatology was the mild level of depression with 7.14%.

Table 2. Levels of depression, anxiety and stress in police personnel in Lima, Peru.

Variable	Frequency (n=210)	Percentage (%)
Level of Depression		
Normal	186	88.57
Mild	15	7.14
Moderate	9	4.29
Severe	0	0
Extremely severe	0	0
Level of Anxiety		
Normal	189	90.00
Mild	12	5.71
Moderate	3	1.43
Severe	5	2.38
Extremely severe	1	0.48
Level of Stress		
Normal	194	92.38
Mild	8	3.81
Moderate	5	2.38
Severe	3	1.43
Extremely severe	0	0

The factors age, sex, relationship status, number of children, COVID-19 and comorbidities and their respective frequencies with depression, anxiety and stress are shown in Table 3.



Table 3. Frequencies of depression, anxiety and stress variables according to the factors studied in police officers in Lima, Peru.

Variables	Depression				Anxiety				Stress			
	Yes		No		Yes		No		Yes		No	
	n	%	n	%	n	%	n	%	n	%	n	%
Age												
Early adulthood (less than or equal to 40 years old))	14	14.73	81	85.27	6	6.32	89	93.68	8	8.42	87	91.58
Middle adulthood (more than 40 years old)	10	8.69	105	91.31	15	13.04	100	86.96	8	6.96	107	93.04
Sex												
Female	7	10.77	58	89.23	5	7.69	60	92.31	8	12.31	57	87.69
Male	17	11.72	128	88.28	16	11.03	129	88.97	8	5.52	137	94.48
Relationship status												
Single	6	8.11	68	91.89	5	6.76	69	93.24	8	10.81	66	89.19
Married	18	13.24	118	86.76	16	11.77	120	88.23	8	5.88	128	94.12
Number of Children												
2 or more children	15	12.50	105	87.50	17	14.17	103	85.83	10	8.33	110	91.67
0-1 child	9	10.00	81	90.00	4	4.44	86	95.56	6	6.67	84	93.33
COVID-19												
Yes	13	15.12	73	84.88	11	12.79	75	87.21	10	11.63	76	88.37
No	11	8.87	113	91.13	10	8.07	114	91.93	6	4.84	118	95.16
Number of COVID-19 Diagnosis												
Twice or more	3	23.08	10	76.92	2	15.39	11	84.61	1	7.69	12	92.31
Once	10	13.69	63	86.31	9	12.33	64	87.67	9	12.33	64	87.67
Comorbidities												
Yes	3	8.57	32	91.43	7	20.00	28	80.00	5	14.29	30	85.71
No	21	12.00	154	88.00	14	8.00	161	92.00	11	6.29	164	93.71

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For the bivariate analysis in the raw prevalence ratio, in the psych-emotional disorder: anxiety, it was found that only the factors number of children (R_{Pc}:3.18; 95%CI [1.10-9.17]; p:0.032) and comorbidities

(R_{Pc}:2.50; 95%CI [1.08-5.75]; p:0.031) are significantly associated; however, for depression and stress no significantly associated factors were found. (Table 4).

Table 4. Bivariate analysis between study variables and the level of depression, anxiety and stress in police officers in Lima, Peru.

Variables	Depression			Anxiety			Stress		
	RP raw	A 95% confidence interval	P-value	RP raw	A 95% confidence interval	P-value	RP raw	A 95% confidence interval	P-value
Age									
Early adulthood (less than or equal to 40 years old)	1.69	0.78-3.64	0.177	0.48	0.19-1.20	0.118	1,21	0,47 a 3,11	0,692
Middle adulthood (more than 40 years old)	1.00			1.00			1,00		
Sex									
Female	0.91	0.39-2.11	0.841	0.69	0.26-1.82	0.463	2,23	0,87 a 5,69	0,093
Male	1.00			1.00			1,00		
Relationship status									
Single	0.61	0.25-1.47	0.276	0.57	0.21-1.50	0.260	1,87	0,71 a 4,70	0,205
Married	1.00			1.00			1,00		
Number of children									
2 or more children	1.25	0.57-2.73	0.576	3.18	1.10-9.17	0.032	1,25	0,47 a 3,32	0,654
0-1 child	1.00			1.00			1,00		
COVID-19									
Yes	1.70	0.79-3.62	0.167	1.58	0.70-3.57	0.266	2,40	0,90 a 6,37	0,078
No	1.00			1.00			1,00		
Comorbidities									
Yes	0.71	0.22-2.27	0.569	2.50	1.08-5.75	0.031	2,27	0,84 a 6,14	0,106
No	1.00			1.00			1,00		

In the results of the multivariate analysis, it was found that the risk factor for depression was age less than or equal to 40 years (RPa:2.50; 95%CI [1.02-6.10]; p:0.044). For having some degree of stress, the significant risk factors were: no partner (RPa:3.10; 95%CI [1.08-8.95]; p:0.034), having a positive

COVID-19 diagnosis (RPa:3.18; 95%CI [1.02-9.92]; p:0.045) and having some comorbidities (RPa:4.19; 95%CI [1.22-14.36]; p:0.022). In contrast, no other associations were found among the other variables. This is shown in Table 5.



Table 5. Multivariate analysis between study variables and the level of depression, anxiety and stress in police officers in Lima, Peru.

Variables	Depression			Anxiety			Stress		
	RP adjusted	A 95% confidence interval	P-value	RP adjusted	A 95% confidence interval	P-value	RP adjusted	A 95% confidence interval	P-value
Age									
Early adulthood (less than or equal to 40 years old)	2.50	1.02-6.10	0.044	0.98	0.32-3.01	0.979	1.82	0.49-6.70	0.365
Middle adulthood (more than 40 years old)	1.00			1.00			1.00		
Sex									
Female	1.02	0.45-2.26	0.960	0.82	0.31-2.19	0.704	2.31	0.82-6.55	0.112
Male	1.00			1.00			1.00		
Relationship status									
Single	0.56	0.20-1.53	0.262	1.17	0.37-3.65	0.783	3.10	1.08-8.85	0.034
Married	1.00			1.00			1.00		
Number of children									
2 or more children	1.71	0.64-4.59	0.282	2.91	0.67-12.55	0.151	2.66	0.76-9.31	0.125
0-1 child	1.00			1.00			1.00		
COVID-19									
Yes	1.54	0.70-3.37	0.276	1.71	0.75-3.89	0.194	3.18	1.02-9.92	0.045
No	1.00			1.00			1.00		
Comorbidities									
Yes	0.84	0.26-2.76	0.785	2.42	0.99-5.93	0.053	4.19	1.22-14.36	0.022
No	1.00			1.00			1.00		

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DISCUSSION

Police personnel, due to the nature of their work, must be physically present to be able to work and serve the communities during the COVID-19 pandemic, which is why they are often exposed to situations of high stress that can affect their work performance and their personal lives⁽¹⁾. The outbreak of this disease has caused impact at the mental level, manifesting symptoms of depression, anxiety, stress, insomnia, among others⁽¹⁰⁻¹³⁾.

In this research, a prevalence of depression of 11.43% was obtained; a result close to that found by Stevelink et al., in a study carried out in 40,299 police officers in the United Kingdom⁽¹⁴⁾, who report a prevalence of 9.8%. The prevalence could be due to the high exposure to traumatic events to which they are subjected during their performance at work.

About 1 in 10 people; this is consistent with the systematic review by Wagner et al., who report a median prevalence of 10.6% in four studies conducted in police officers in Italy and Canada⁽¹⁵⁾. The percentage found would correspond to the association between anxiety and the perception of little support received.

The prevalence of stress was 7.62%, which is lower than the combined prevalence of 14.2% of post-traumatic stress syndrome reported by Syed et al.⁽⁴⁾ in a systematic review and meta-analysis that included 60 cross-sectional and 7 longitudinal studies conducted in police officers worldwide. In this sense, the low percentage observed in this study may be due to the personality profile and acquired resilience of Peruvian police officers, which gives them a greater capacity to face stressful situations optimally and with low vulnerability⁽⁶⁾, allowing them to ensure that the general population comply with the preventive quarantine measures implemented by different governments around the world due to the COVID-19 pandemic.

In the bivariate analysis, the first factor significantly associated with having a higher prevalence of anxiety was having two or more children with $RPc:3.18$; $95\%CI [1.10-9.17]$; a finding similar to that found by Kimhi et al. in a study conducted in 300 people (general population) in Israel⁽⁹⁾, where it was reported that the more children they had, the higher the prevalence of anxiety ($p<0.01$); furthermore, in a similar study conducted by Fitzpatrick et al. in 10 368 adults (national sample) in the United States⁽¹²⁾, a significant correlation was found between both

variables ($p:0.001$).

The second factor associated with the development of anxiety symptoms was having comorbidities ($RPc:2.50$), which presented a statistically significant association. This coincides with the study by Wu et al. conducted in 281 Chinese criminal police officers⁽¹⁶⁾, which indicates that having a history of chronic disease was significantly associated with anxiety ($p:0.020$). Likewise, the study by Stevelink et al.⁽¹⁴⁾, reveals that the percentage of self-reported hypertension was high in those who presented anxiety symptoms ($p<0.001$).

In the multivariate analysis, depression was significantly associated with age less than or equal to 40 years ($RPa:2.50$). In a similar study, Stevelink et al.⁽¹⁴⁾ found that police officers under 30 years of age had a greater association with depressive symptoms ($p<0.001$). This is due to the ease with which people in this age group have access to alarming information on COVID-19, which predisposes them to develop affective disorders⁽¹⁷⁾.

Likewise, in the multivariate analysis, an association was found between stress and the variables: the fact the not being in a sentimental relationship ($PRa:3.10$; $95\%CI [1.08-8.95]$), positive COVID-19 diagnosis ($PRa:3.18$; $95\%CI [1.02-9.92]$) and having comorbidities ($PRa:4.19$; $95\%CI [1.22-14.36]$).

In this sense, in the sentimental situation variable, the evidence shows that single individuals present greater emotional exhaustion than married individuals, in addition to presenting lower personal achievement. Single police officers experience more burnout than married ones, so they may need organizational support to cope with burnout⁽¹⁸⁾.

On the other hand, police officers who were diagnosed with COVID-19 experienced greater stress than those who were not diagnosed; similar to the meta-analysis study conducted by Krishnamoorthy et al.⁽¹⁹⁾ which included 50 studies at the international level, and refers that 96% of patients with COVID-19 presented post-traumatic stress.

In addition, it was found that those with some comorbidity experienced a higher degree of stress ($RPa:4.19$), which presents a statistically significant association, and coincides with the study by Blanco-Álvarez et al. carried out in 66 officers of the Costa Rican Penitentiary Police⁽²⁰⁾, where it is reported that stress was significantly associated with psychophysiological diseases such as asthma ($p<0.05$) and insomnia ($p<0.01$). Likewise, the study



conducted by Walvekar et al. in 108 police officers in India⁽²¹⁾, reported that 38% of them presented cardiometabolic syndrome, and they also found that high levels of serum cortisol due to work stress were significantly related to symptoms of cardiometabolic syndrome ($p < 0.001$).

A limitation in the study is that the self-reported scales of depression, anxiety and stress are not always aligned with the diagnostic evaluation of mental health professionals, which could lead to underreporting. It is observed that the study obtained a low statistical power for some associations, so it is recommended that more studies with better power be carried out in order to clarify these associations. In addition, it is recommended to analyze the variables: resistant personality, resilience and length of service⁽⁷⁾ as protective factors against the development of affective disorders.

In view of the circumstances faced by police officers, the present work is opportune to develop health

Authorship contributions: The authors participated in the genesis of the idea, project design, data collection and interpretation, analysis of results and preparation of the manuscript of this research work.

Financing: This research has not received specific aid from agencies of the public sector, commercial sector or non-profit entities.

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interventions⁽²²⁾ that strengthen mental health and allow them to develop psychosocial skills necessary to face extreme situations; in addition to the use of technology to provide timely medical and psychological guidance. Likewise, it is necessary to promote the importance of the availability of quality Personal Protective Equipment for the health care of police officers, as this will give them a sense of security that will reduce their vulnerability to the development of psycho-affective disorders.

CONCLUSIONS

A low prevalence of depression, anxiety and stress was observed in the study population. Furthermore, according to multivariate analysis, risk factors for stress were being single, having been diagnosed with COVID-19 and having comorbidities, while being 40 years old or younger was a risk factor for depression.

Interest conflict: The authors declare that they have no conflict of interest.

Received: August 18, 2021

Approved: September 28, 2021

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