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ORIGINAL

Clinical and epidemiological factors associated with post-traumatic stress in medical interns during the COVID-19 pandemic in a Peruvian hospital, 2021

Factores clínicos y epidemiológicos asociados al estrés postraumático en médicos internos durante la pandemia de COVID-19 en un hospital peruano, 2021

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ABSTRACT

Introduction: post-traumatic stress is a potential psychological and behavioral consequence of exposure to a traumatic event, characterized by the inability to overcome an unpleasant experience. Medical students, especially during their internships, often encounter stressful situations and challenges.
Objective: this study aims to investigate the psychological impact of the COVID-19 pandemic on medical interns and identify the clinical and epidemiological factors associated with PTSD.
Methods: this cross-sectional observational study utilized the Posttraumatic Stress Disorder Symptom Severity Scale and a validated form for clinical and epidemiological factors. The study was conducted with medical students from the Universidad Privada San Juan Bautista and Universidad Nacional San Luis Gonzaga. Data analysis was performed using SPSS Version 25.
Results: this study revealed that 47,1 % of medical interns experienced low levels of post-traumatic stress, 42,5 % experienced moderate levels, and 10,3 % experienced high levels. Clinical and epidemiological factors that showed a statistically significant correlation ($p<0,05$) with post-traumatic stress included working extra shifts, caring for COVID-19 patients, having infected relatives, and experiencing harassment or verbal aggression from patients, colleagues, or other hospital staff.
Conclusion: this study suggests that clinical and epidemiological factors, such as caring for COVID-19 patients, working extra shifts, and experiencing harassment or verbal aggression from patients or colleagues, are associated with post-traumatic stress in medical interns.

Keywords: Post-Traumatic Stress Disorders; COVID-19; Mental Health; Internship.

RESUMEN

Introducción: el estrés postraumático es una posible consecuencia psicológica y conductual de la exposición a un acontecimiento traumático, caracterizada por la incapacidad de superar una experiencia desagradable. Los estudiantes de medicina, especialmente durante sus prácticas, se enfrentan a menudo a situaciones y retos estresantes.
Objetivo: este estudio pretende investigar el impacto psicológico de la pandemia de COVID-19 en los médicos internos e identificar los factores clínicos y epidemiológicos asociados al TEPT.

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Métodos: este estudio observacional transversal utilizó la Escala de Gravedad de los Síntomas del Trastorno de Estrés Postraumático y un formulario validado para los factores clínicos y epidemiológicos. El estudio se realizó con estudiantes de medicina de la Universidad Privada San Juan Bautista y de la Universidad Nacional San Luis Gonzaga. El análisis de los datos se realizó con el programa SPSS versión 25.
Resultados: este estudio reveló que el 47,1 % de los médicos internos experimentaron niveles bajos de estrés postraumático, el 42,5 % experimentaron niveles moderados y el 10,3 % experimentaron niveles altos. Los factores clínicos y epidemiológicos que mostraron una correlación estadísticamente significativa ($p<0,05$) con el estrés postraumático incluyeron trabajar turnos extra, atender a pacientes con COVID-19, tener familiares infectados y sufrir acoso o agresiones verbales por parte de pacientes, colegas u otro personal del hospital.
Conclusiones: este estudio sugiere que factores clínicos y epidemiológicos, como atender a pacientes con COVID-19, trabajar turnos extra y sufrir acoso o agresiones verbales por parte de pacientes o compañeros, están asociados con el estrés postraumático en médicos internos.

Palabras clave: Trastornos de Estrés Postraumático; COVID-19; Salud Mental; Internado Médico.

INTRODUCTION

The outbreak of the coronavirus disease (COVID-19) began in Wuhan, China in December 2019 and reached pandemic status in March 2020. In Peru, the first confirmed case was reported on March 6, 2020.[1,2] On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic. On the same day, Peru declared a national health emergency and issued measures for the prevention and control of COVID-19.[3]

It has been demonstrated that healthcare workers experienced emotional stress, depression, anxiety, and post-traumatic stress disorder (PTSD) during or even after infectious disease outbreaks.[4] While most of these emotions may be normal for some people, in emergency situations, there is an increase in emotional reactions, and some individuals may have a significant impact on their emotional health, especially healthcare workers who are on the front lines of this COVID-19 disease.[5,6]

Medical interns who have been on the front line of caring for COVID-19 patients have been in an unprecedented situation, having to make complex decisions and work under pressure in high-stress situations. These decisions may include how to provide scarce resources to needy patients and provide care for seriously ill patients with limited and inadequate resources, which can cause some medical interns to experience mental health problems that will also be affected by their personal motives such as their own physical and mental health needs as well as those of patients, family, and friends.[7]

Post-traumatic stress disorder is a possible psychological and behavioral consequence of exposure to a traumatic event and refers to the inability to overcome an unpleasant experience. In patients who have suffered or witnessed a traumatic experience, this is a normal process, but if it lasts for approximately more than a month, preventing progress, it becomes post-traumatic stress disorder.[8]

In a study in Wuhan 10,5 % of the medical staff experienced PTSD symptoms, and insomnia severity.[9] Similarly, a study conducted in Lima, Peru, reported a considerable number of participants experiencing stress in their careers, with the majority of unfavorable responses coming from female participants.[5]

The crisis situation faced by medical interns during the COVID-19 pandemic is causing mental health problems due to various factors, including the epidemiological and clinical factors present in their daily lives and workplaces. These mental health problems can have negative effects on patient care, decision-making, and practical skills. Therefore, it is crucial to protect the mental health of medical interns for the proper epidemiological control of this disease. The traumatic experiences of dealing with COVID-19 patients and the associated stress can result in indelible emotional memories that persist over time, affecting the overall well-being of healthcare workers.[4]

The present study aims to investigate the psychological impact of the COVID-19 pandemic on medical interns and identify the clinical and epidemiological factors associated with PTSD. By shedding light on the factors that contribute to PTSD, the study seeks to provide vital support to future doctors who may face similar situations and help them cope with the mental health challenges of working on the front lines of the pandemic. The study will focus on medical interns from two universities at the Hospital Regional de Ica in Peru, where the COVID-19 outbreak has had a significant impact on the healthcare system.

METHODS

An observational, cross-sectional study was conducted in Medical Interns from the Faculty of Medicine of the Universidad Privada San Juan Bautista (UPSJB) and the Universidad Nacional San Luis Gonzaga (UNSLG).

To collect data, a survey was administered, in which participants were informed about the purpose of the research and their participation was voluntary and anonymous. The survey consisted of seven sections,

which included questions related to epidemiological and clinical factors such as gender, age, marital status, cohabitants, family type, work activity, number of working hours per week, extra shifts, exposure to COVID-19 patients, type of transportation, time taken to reach their workplace, university affiliation, sexual harassment victimization, verbal aggression, and physical aggression.

The objective of the second to seventh sections was to determine the presence or absence of post-traumatic stress disorder in the medical interns, for which the Severity of Posttraumatic Stress Disorder Symptoms Scale was used. This structured evaluation instrument is hetero-applied and utilizes a Likert-type format from 0 to 3, based on the frequency and intensity of the symptoms. The scale has a nuclear part (EGS-R) and a complementary part, with 21 core items (range: 0-63 points) corresponding to the diagnostic criteria of DSM-5. These items cover re-experiencing (range: 0-15), behavioral/cognitive avoidance (range: 0-9), cognitive alterations and negative mood (AC/EAN) (range: 0-21), hyperarousal (range: 0-18), as well as four additional items related to dissociation (range: 0-12).

Data collection was conducted virtually between March and April 2021. Once the participants were confirmed to meet the inclusion criteria, the survey was administered to them virtually. Quality control measures were implemented to ensure the content of the survey instrument and variable adaptation were accurate.

The study's inclusion criteria were limited to interns of both genders who worked during the COVID-19 pandemic at the Ica Regional Hospital. Exclusion criteria were also established, which excluded interns from other health sciences careers, those with mental illness or users of psychiatric medication.

For this purpose, the Excel program was used, after which the data were transferred to the IBM SPSS program for statistical analysis, using frequencies and double-entry tables with the use of Chi-square as a statistical hypothesis test. A p-value of less than 0,05 was considered significant.

The research was approved by the San Juan Bautista Private University's Institutional Research Ethics Committee (CIEI) and classified as a "minimum risk study." The survey did not include any personal identifiers, and informed consent was obtained from all study subjects, ensuring the confidentiality of their results. The research complied with the international ethical standards for biomedical research involving human subjects outlined in the Declaration of Helsinki.

RESULTS

The study included 87 medical interns from two universities, UNSLG (n=49) and UPSJB (n=38) who were surveyed at the beginning and end of the study period (Table 1). In terms of epidemiological factors, most participants were female (55,2 %) and aged between 22 and 25 years old (62,1 %). Additionally, 79,3 % were single, 31,0 % reported living with three people, and 85,1 % belonged to functional families. Most participants (89,7 %) reported their work activity as their internship, and the majority worked between 50 and 100 hours per week. Half of the participants performed extra shifts, and 78,2 % reported having a close family member infected with COVID-19. The majority (83,9 %) attended to less than 20 patients, and 39,1 % used private transportation to get to their workplace. Most participants (73,6 %) took between 3 to 30 minutes to get to their workplace (table 1).

Table 1. Epidemiological factors related to post-traumatic stress in medical interns from two universities in the Regional Hospital of Ica at the time of the COVID 19 pandemic, 2021

Epidemiological factors	n=87	
	Frequency	%
Sex		
Female	48	55,2
Male	39	44,8
Age		
From 22 to 25	54	62,1
From 26 to 30	21	24,1
From 31 to 35	12	13,8
Marital status:		
Married	11	12,6
Divorced	7	8,0
Single	69	79,3
How many people do you live with?		
1	9	10,3

2	20	23,0
3	27	31,0
4	16	18,4
5 or more	15	17,2
Family Type		
Dysfunctional	13	14,9
Functional	74	85,1
Work Activity:		
Internship	78	89,7
Internship and extra work	9	10,3
Number of working hours per week		
From 50 to 100 hours	55	63,2
From 101 to 150 hours	21	24,1
151 or more	11	12,6
Do you work extra shifts?		
No	43	49,4
Yes	44	50,6
Has a close relative been infected with COVID-19?		
No	19	21,8
Yes	68	78,2
Average number of patients seen		
Less than 20 people	73	83,9
21 to 35 persons	11	12,6
36 or more people	3	3,4
What means of transportation do you use to get to your workplace?		
Walking	6	6,9
Bus	28	32,2
Private	34	39,1
By Taxi	19	21,8
Time it takes to get to your workplace		
From 3 to 30 minutes	64	73,6
40 to 50 minutes	14	16,1
1 to 5 hours	9	10,3
Which university do you belong to?		
Universidad Nacional San Luis Gonzaga	49	56,3
Universidad Privada San Juan Bautista	38	43,7

In terms of clinical factors, more than half of the participants (51,7 %) reported being exposed to COVID-19 patients, and the same proportion reported being victims of sexual harassment. Moreover, 60,9 % reported being victims of verbal aggression, while only 13,8 % reported being victims of physical aggression (table 2).

Table 2. Clinical factors related to post-traumatic stress in medical interns

Clinical Factors	**n=87**	
	Frequency	**%**
Have you been exposed to COVID 19 patients without protective measures during your internship?		
No	42	48,3
Yes	45	51,7
Were you a victim of sexual harassment either by patients, peers, superiors or other hospital staff?		

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No	42	48,3
Yes	45	51,7
Were you a victim of verbal aggression either by patients, colleagues, superiors or other hospital personnel?		
No	34	39,1
Yes	53	60,9
Were you a victim of physical aggression either by patients, colleagues, superiors or other hospital personnel?		
No	75	86,2
Yes	12	13,8

When considering the proportion of post-traumatic stress disorder dimensions, moderate stress levels were reported in the re-experiencing (32,2 %), behavioral/cognitive avoidance (27,6 %), cognitive alterations and negative mood (33,3 %), and increased activation and psychophysiological reactivity (32,2 %) dimensions (table 3).

Table 3. Dimensions of post-traumatic stress in medical interns

Dimensions of post-traumatic stress	**n=87**	
	Frequency	**%**
Reexperiencing		
Low / no post-traumatic stress	45	51,7
Moderate	28	32,2
High	14	16,1
Behavioral/cognitive avoidance		
Low / no post-traumatic stress	59	67,8
Moderate	24	27,6
High	4	4,6
Cognitive disturbances and negative moods		
Low / no post-traumatic stress	49	56,3
Moderate	29	33,3
High	9	10,3
Increased activation and psychophysiological reactivity		
Low / no post-traumatic stress	44	50,6
Moderate	28	32,2
High	15	17,2

A chi-square test was conducted to investigate the relationship between clinical and epidemiological factors and post-traumatic stress disorder in medical interns. The results showed a significant association between the experience of working extra shifts (p=0,03), being exposed to COVID-19 patients without protection (p=0,00), having a close family member infected with COVID-19 (p=0,02), being a victim of sexual harassment (p=0,03), and being a victim of verbal aggression (p=0,01) (table 4).

Table 4. Relationship between clinical and epidemiological factors with post-traumatic stress in medical interns

Relationship between clinical and epidemiological factors with posttraumatic stress.	**Post-traumatic stress**						**Total**		**X2**	**p (valor)**
	Low / no post-traumatic stress		**Moderate**		**High**					
	Fi	**%**	**Fi**	**%**	**Fi**	**%**	**Fi**	**%**		
Do you work extra shifts?										
No	21	24,1 %	15	17,2 %	8	9,2 %	44	50,6 %	6,783	0,03
Yes	20	23,0 %	22	25,3 %	1	1,1 %	43	49,4 %		
Have you been exposed to COVID 19 patients without protective measures during your internship?										

No	21	24,1 %	12	13,8 %	9	10,3 %	42	48,3 %	13,505	0,00
Yes	20	23,0 %	25	28,7 %	0	0,0 %	45	51,7 %		
Has a close relative been infected with COVID-19?										
No	14	24,1 %	5	5,7 %	0	10,3 %	19	21,8 %	7,655	0,02
Yes	27	23,0 %	32	36,8 %	9	0,0 %	68	78,2 %		
Were you a victim of sexual harassment either by patients, colleagues, superiors or other hospital staff?										
No	26	29,9 %	13	14,9 %	3	3,4 %	42	48,3 %	7,127	0,03
Yes	15	17,2 %	24	27,6 %	6	6,9 %	45	51,7 %		
Were you a victim of verbal aggression either by patients, colleagues, superiors or other hospital personnel?										
No	22	25,3 %	8	9,2 %	4	4,6 %	34	39,1 %	8,506	0,01
Yes	19	21,8 %	29	33,3 %	5	5,7 %	53	60,9 %		

DISCUSSION

The findings of this study provide insights into the epidemiological and clinical factors that may be associated with PTSD in medical interns during the COVID-19 pandemic. Some authors argue that pandemic Covid-19 does not fit existing PTSD models and the necessary diagnostic criteria, however, there is increasing evidence of pandemic-related traumatic stress symptoms. Current models focus on past and direct trauma exposure, and additional research is needed to better understand risk factors specific to healthcare workers in the context of Covid-19.[10]

These findings are consistent with previous studies that have reported a higher prevalence of PTSD among females and younger individuals. Additionally, a high percentage of interns reported working long hours (50 to 100 hours weekly) and doing extra shifts (50,6 %), which may have contributed to increased stress and burnout.[3,11]

Regarding clinical factors, the study found that over half of interns were exposed to COVID-19 patients, and the same percentage reported being victims of sexual harassment. A French study report a prevalence of humiliation, sexual harassment, and sexual abuse during their curriculum were 23 %, 25 %, and 4 %, respectively. Additionally, the study by Rotenstein showed a high rates of burnout and intent to leave the job across healthcare.[12] Finally, given that high workload levels can lead to depression and anxiety, it is possible that these factors contribute to the development of PTSD.[7]

When evaluating PTSD in medical interns from two universities, the majority reported experiencing at least one symptom of PTSD. Specifically, 47,1 % reported low stress, 42,5 % reported moderate stress, and 10,3 % reported high stress. These findings are consistent with the study by Marco,[13] which investigated PTSD symptoms in emergency physicians who often encounter stressful clinical situations. Their study of 1300 emergency physicians found that 22,3 % reported stress symptoms compatible with PTSD. This suggests that healthcare workers are at risk of developing PTSD during a pandemic, given the increased stress and exposure to trauma. Li found a pooled prevalence of 21,5 % of healthcare workers with PTSD.[14] Overall, these results highlight the need for better support and resources for healthcare workers to prevent and manage PTSD symptoms.

PTSD doesn't just affect the behavioral and mental health symptoms of healthcare workers; it can also lead to an alteration and dysbiosis of the intestinal microbiota, as demonstrated in an interesting study.[15] This highlights the comprehensive impact of PTSD on all aspects of health in those who suffer from it.

The analysis revealed a significant relationship between post-traumatic stress and multiple factors. These results suggest that increased workload and longer working hours are associated with an increased risk of developing PTSD. According to a Chinese study, healthcare workers who were on the front lines during the COVID-19 pandemic, with increased workload and stress, were at increased risk of developing PTSD.[16]

These findings suggest that a higher prevalence of PTSD is associated with exposure to COVID-19 among interns who did not have adequate protective measures in place. Similarly in Norway, a study indicated that healthcare workers and public service providers experienced markedly elevated levels of PTSD symptoms, anxiety and depression during the COVID-19 pandemic, which were significantly higher in those who worked directly compared to those who worked indirectly.[17]

Medical interns are known to experience high levels of stress due to the demanding nature of their work.[18] This stress can be exacerbated by verbal aggression from supervisors or colleagues. Studies have found that verbal abuse is prevalent in medical education, with interns reporting high levels of verbal aggression from attending physicians.[19]

The pandemic can also be seen as an opportunity for improvement. An American study found that during the COVID-19 pandemic, factors such as resilience and social support were associated with greater posttraumatic growth in healthcare personnel, suggesting that reinforcement of these factors may promote posttraumatic

growth and mitigate the risk of PTSD symptoms.[20] The COVID-19 pandemic and its impact on the mental health of diverse populations is an evolving area of research, and the factors that may be related to PTSD in healthcare workers are still being understood.

Having a close relative infected with COVID-19 was associated with the presence of PTSD. This had been seen previously when Petrinec found that relatives of patients hospitalized in the ICU had up to 11 % of PTSD.[21] Similarly, in a study associated with COVID, there was family chaos and behavioral disturbances in relatives of hospitalized patients.[22]

CONCLUSIONS

In conclusion, this study underscores the significance of epidemiological and clinical factors in influencing post-traumatic stress among medical interns. The identified associations between working conditions, exposure to COVID-19, personal experiences, and post-traumatic stress highlight the need for targeted interventions and support systems within medical training environments to mitigate the risk and impact of psychological distress among healthcare professionals.

REFERENCES

1. Dhama K, Khan S, Tiwari R, Sircar S, Bhat S, Malik YS, et al. Coronavirus Disease 2019–COVID-19. Clinical Microbiology Reviews. 2020 Jun 24;33(4):e00028-20.

2. Ruiz J. COVID-19: chronicle of a pandemic foretold. Microbes, Infection and Chemotherapy. 2022 Jan 25;2:e1343–e1343.

3. Fabian-Moya SP, Arevalo-Marcos R, Vargas-Calero K, Ayala-Piñan S. Internado durante la Pandemia de la COVID-19: Problemática de la legislación Peruana. Revista Peruana de Investigación en Salud. 2022 Oct 30;6(4):231–3.

4. Andhavarapu S, Yardi I, Bzhilyanskaya V, Lurie T, Bhinder M, Patel P, et al. Post-traumatic stress in healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. Psychiatry Res. 2022 Nov;317:114890.

5. Asenjo-Alarcón JA, Linares-Vásquez O, Díaz-Dávila YY. Nivel de estrés académico en estudiantes de enfermería durante la pandemia de COVID-19. Revista Peruana de Investigación en Salud. 2021 Apr 7;5(2):59–66.

6. Kumar-Munjal S, Singh-Dhakad M, Kumar M, Gogoi S. A cross-sectional study to assess knowledge, attitude and practice among healthcare workers regarding COVID-19 at a National Institute of North India. Microbes, Infection and Chemotherapy. 2022 Nov 14;2:e1547–e1547.

7. Lee CM, Juarez M, Rae G, Jones L, Rodriguez RM, Davis JA, et al. Anxiety, PTSD, and stressors in medical students during the initial peak of the COVID-19 pandemic. PLOS ONE. 2021 Jul 29;16(7):e0255013.

8. Bou Sanayeh E, El Chamieh C, Saade MC, Maalouf RG, Bizri M. Post-traumatic stress symptoms experienced by healthcare workers in Lebanon four months following Beirut's ammonium nitrate explosion: a survey-based study. Arch Public Health. 2022 Jun 17;80(1):156.

9. Mei S, Liang L, Ren H, Hu Y, Qin Z, Cao R, et al. Association Between Perceived Stress and Post-Traumatic Stress Disorder Among Medical Staff During the COVID-19 Epidemic in Wuhan City. Front Public Health. 2021;9:666460.

10. Bridgland VME, Moeck EK, Green DM, Swain TL, Nayda DM, Matson LA, et al. Why the COVID-19 pandemic is a traumatic stressor. PLoS One. 2021;16(1):e0240146.

11. Liu CH, Tang WR, Weng WH, Lin YH, Chen CY. The process of coping with stress by Taiwanese medical interns: a qualitative study. BMC Med Educ. 2016 Jan 12;16:10.

12. Rotenstein LS, Brown R, Sinsky C, Linzer M. The Association of Work Overload with Burnout and Intent to Leave the Job Across the Healthcare Workforce During COVID-19. J Gen Intern Med. 2023 Mar 23;1–8.

13. Marco CA, Larkin GL, Feeser VR, Monti JE, Vearrier L, ACEP Ethics Committee. Post-traumatic stress and stress disorders during the COVID-19 pandemic: Survey of emergency physicians. J Am Coll Emerg Physicians

Open. 2020 Dec;1(6):1594–601.

14. Li Y, Scherer N, Felix L, Kuper H. Prevalence of depression, anxiety and post-traumatic stress disorder in health care workers during the COVID-19 pandemic: A systematic review and meta-analysis. PLoS One. 2021;16(3):e0246454.

15. Gao F, Guo R, Ma Q, Li Y, Wang W, Fan Y, et al. Stressful events induce long-term gut microbiota dysbiosis and associated post-traumatic stress symptoms in healthcare workers fighting against COVID-19. J Affect Disord. 2022 Apr 15;303:187–95.

16. Ouyang H, Geng S, Zhou Y, Wang J, Zhan J, Shang Z, et al. The increase of PTSD in front-line health care workers during the COVID-19 pandemic and the mediating role of risk perception: a one-year follow-up study. Transl Psychiatry. 2022 May 3;12(1):1–7.

17. Johnson SU, Ebrahimi OV, Hoffart A. PTSD symptoms among health workers and public service providers during the COVID-19 outbreak. PLOS ONE. 2020 Oct 21;15(10):e0241032.

18. Camp M, Sadler J. Moral distress in medical student reflective writing. AJOB Empirical Bioethics. 2019 Jan 2;10(1):70–8.

19. Owoaje ET, Uchendu OC, Ige OK. Experiences of mistreatment among medical students in a university in south west Nigeria. Niger J Clin Pract. 2012;15(2):214–9.

20. Feingold JH, Hurtado A, Feder A, Peccoralo L, Southwick SM, Ripp J, et al. Posttraumatic growth among health care workers on the frontlines of the COVID-19 pandemic. J Affect Disord. 2022 Jan 1;296:35–40.

21. Petrinec AB, Martin BR. Post-intensive care syndrome symptoms and health-related quality of life in family decision-makers of critically ill patients. Palliat Support Care. 2018 Dec;16(6):719–24.

22. Cassinat JR, Whiteman SD, Serang S, Dotterer AM, Mustillo SA, Maggs JL, et al. Changes in family chaos and family relationships during the COVID-19 pandemic: Evidence from a longitudinal study. Developmental Psychology. 2021 Oct;57(10):1597–610.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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