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ORIGINAL

The Factors Influencing the Depression, Anxiety, and Stress of Grassroots Healthcare Workers in the Context of the Covid-19 Pandemic in the Vietnamese Mekong Delta: A Cross-Sectional Study in An Giang Province

Los factores que influyen en la depresión, la ansiedad y el estrés de los trabajadores de la salud a nivel comunitario en el contexto de la pandemia de Covid-19 en el delta del Mekong vietnamita: un estudio transversal en la provincia de An Giang

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ABSTRACT

Introduction: grassroots health workers are crucial in Vietnam's healthcare system. As the frontline of healthcare, closest to the community, they are considered the backbone for disease prevention, control efforts, and initial healthcare for the population. The Ministry of Health in Vietnam has endeavored to improve infrastructure, equipment, and workforce quality, along with providing mental health care for grassroots healthcare workers to effectively carry out health education, disease prevention, and well-organized healthcare services. This paper aims to investigate factors affecting depression, anxiety, and stress among grassroots health workers in An Giang Province located in the Vietnamese Mekong Delta region.
Method: a population-based cross-sectional study was conducted using data from the 2023 Grassroots health workers in An Giang Province. A total of 466 grassroots health workers were selected. The Research method to collect quantitative data from the questionnaire tools was applied and data analysis was conducted using the SPSS 22.0.
Results: the research findings showed that 18,3 %, 28,8 %, and 16,8 % of participants exhibited symptoms of depression, anxiety, and stress, respectively, predominantly at mild, moderate, severe, and extremely severe levels. Risk factors impacting mental health included income and benefits, COVID-19 infection, and prolonged symptoms affecting physical health, as well as workplace infrastructure.
Conclusions: improving salary policies, physical health care, and upgrading workplace infrastructure will reduce the risk of mental health issues among grassroots health workers, both during the pandemic and in the future.

Keywords: Grassroofs Healthcare Workers; Depression; Anxiety; Stress; Influence Factors; COVID-19.

RESUMEN

Introducción: los trabajadores de la salud a nivel comunitario son cruciales en el sistema de salud de Vietnam. Como la primera línea de atención médica, más cercana a la comunidad, se consideran la columna vertebral para la prevención de enfermedades, los esfuerzos de control y la atención médica inicial para la población. El Ministerio de Salud de Vietnam ha esforzado en mejorar la infraestructura, el equipamiento y la calidad de la fuerza laboral, junto con proporcionar atención de salud mental para los trabajadores de la salud a nivel comunitario, para llevar a cabo de manera efectiva la educación en salud, la prevención de enfermedades y servicios de atención médica bien organizados. Este documento tiene como objetivo

investigar los factores que afectan la depresión, la ansiedad y el estrés entre los trabajadores de la salud a nivel comunitario en la provincia de An Giang, ubicada en la región del delta del Mekong vietnamita.
Métodos: Se realizó un estudio transversal basado en la población utilizando datos de los trabajadores de la salud a nivel comunitario de la provincia de An Giang en 2023. Se seleccionó un total de 466 trabajadores de la salud a nivel comunitario. Se aplicó el método de investigación para recopilar datos cuantitativos a partir de herramientas de cuestionario y se realizó el análisis de datos utilizando el SPSS 22.0.
Resultados: Los hallazgos de la investigación mostraron que el 18,3 %, 28,8 %, 16,8 % de los participantes exhibieron síntomas de depresión, ansiedad y estrés, respectivamente, predominantemente en niveles leves, moderados, graves y extremadamente graves. Los factores de riesgo que impactan la salud mental incluyeron ingresos y beneficios, infección por COVID-19 y síntomas prolongados que afectan la salud física, así como la infraestructura del lugar de trabajo.
Conclusiones: Mejorar las políticas salariales, la atención de la salud física y la mejora de la infraestructura del lugar de trabajo reducirá el riesgo de problemas de salud mental entre los trabajadores de la salud a nivel comunitario, tanto durante la pandemia como en el futuro.

Palabras clave: Trabajadores de la Salud a Nivel Comunitario; Depresión; Ansiedad; Estrés; Factores Influyentes; COVID-19.

INTRODUCTION

Human resources are one of the most crucial and decisive factors determining the sustainability and development of the national healthcare system. Following the COVID-19 pandemic, the phenomenon of healthcare staff resigning or quitting their positions at public healthcare facilities, especially at the grassroots level, has occurred in many places. To mitigate this issue and help healthcare professionals regain balance, providing care and support for their mental health is considered a critical element primarily influencing the healthcare workforce in the current context. It is believed that preventing negative impacts on the mental state of healthcare workers must be a key objective in disaster preparedness.

Primary healthcare in Vietnam is a type of public healthcare, belonging to local healthcare systems, including village, communal, ward, township, district, and provincial levels. This is the initial healthcare level, closest to the people, ensuring basic healthcare for all at the lowest cost. Primary healthcare plays a vital role in protecting, caring for, and improving the physical and mental health of the population, implementing primary healthcare activities, and target health programs, especially providing medical examination and treatment for people in rural areas, mountainous regions, remote and disadvantaged areas, islands, and economically and socially difficult regions. Therefore, primary healthcare is always considered the "backbone" of the national healthcare system in Vietnam. In the process of reforming the healthcare system in Vietnam, one of the key tasks is to focus on building the grassroots healthcare system and healthcare workforce. Chapter I - Article 4 of the 2023 Vietnamese Medical Examination and Treatment Law clearly states "prioritize budget allocation for the development of healthcare facilities, grassroots healthcare, and peripheral emergency care systems; and enhance the development of healthcare workforce, especially in the fields of infectious diseases, mental health, pathology, forensic medicine, forensic psychiatry, and emergency resuscitation".[1] In An Giang Province, the healthcare sector has also implemented and carried out many activities to improve the quality of grassroots healthcare activities, proactively engage in preventive healthcare, and effectively implement disease prevention work, especially COVID-19 prevention. According to the preliminary report on healthcare activities in the first six months of 2023 by the An Giang Provincial Department of Health, alongside the achieved results, the healthcare sector in An Giang has been unable to recruit civil servants as prescribed (grassroots healthcare workforce is lacking in both quantity and quality, especially at the commune level); on the other hand, based on the provisions of Article 1 of Decree No. 05/2023/NĐ-CP, it is impossible to pay preferential allowances based on professions for contracted employees.[2]

Healthcare workers at the grassroots level are those working in healthcare centers and stations at the district, town, and city levels of the province. These individuals play a crucial role in providing healthcare to the population and implementing disease prevention programs, especially in the fight against outbreaks such as COVID-19. According to Decision No. 155/QĐ-TTg dated January 29, 2022, approving the National Plan for Prevention and Control of Non-Communicable Diseases and Mental Health Disorders for the period 2022-2025, grassroots healthcare workers also have the role of "early detection of mental health disorders in the population." Overall, compared to other professions, healthcare workers in general and grassroots healthcare workers in particular experience higher levels of stress, anxiety, and depression due to work overload and the distress of witnessing suffering during the COVID-19 pandemic. A cross-sectional study involving 146 doctors and 74 nurses at Thai Binh University of Medicine Hospital showed that 35,5 % experienced emotional stress, with 66,7 % at mild to moderate levels, and females experienced more mild to moderate emotional stress than males.[3]

Similarly, in a study on the mental health issues of healthcare workers, Nhan Nguyen, and colleagues utilized the Depression, Anxiety, and Stress Scale (DASS-21) to measure stress levels among 746 frontline healthcare workers in Da Nang, where 44,6 % of healthcare workers showed signs of stress, and 18,9 % showed signs of severe or extremely severe stress.[4] Nguyen and colleagues' study also revealed that 22,6 % of healthcare workers had social-psychological problems.[5] Research by Bui Thi Thanh Van and colleagues showed that the prevalence of anxiety, stress, and depression among healthcare workers involved in COVID-19 prevention and control in some hospitals was 19,5 %, 8 %, and 5,7 %, respectively, with 28,9 % of nurses showing signs of psychological disorders post-trauma.[6] The mental health status of healthcare workers after 2 years of the COVID-19 pandemic in Dak Lak Province is also concerning, with stress rates at 23,6 %, anxiety at 44,0 %, and depression at 30,3 %.[7] Nguyen Thi Thanh Truc and colleagues also surveyed 94 nurses at Can Tho University of Medicine and Pharmacy Hospital, with results showing stress, anxiety, and depression rates of 15,9 %, 22,4 %, and 24,5 %, respectively.[8] Several factors contribute to increasing stress among healthcare workers, including heavy workloads, long working hours, high pace, lack of physical or psychological safety, chronicity of care, moral conflicts, perceptions of job insecurity, and workplace bullying or lack of social support. Gender, age, living alone, and exposure to COVID-19 are related to the mental health of healthcare workers during the COVID-19 pandemic.[9] Psychological worries can lead to exhaustion, depression, anxiety disorders, sleep disorders, and other illnesses.[10] A study by Nguyen Thai Quynh Chi and colleagues surveyed 250 nurses, showing that two groups of stressors for clinical nurses are "facing the death of patients" and "issues related to the patient's family", especially "facing the death of patients".[11] Increased workload, respiratory symptoms, digestive symptoms, specific COVID-19-related testing, family caregiving, negative coping styles, and job burnout are independent risk factors for anxiety.[12] Additionally, factors such as being a doctor or nurse, less than 1 year of experience, university education, living with 4-5 people, distance of 1000–5000m between home and workplace, participating in COVID-19 prevention for less than 1 week, home social isolation, community influence, inadequate equipment in current workplace conditions, working regularly in departments directly exposed to COVID-19 patients, and feeling anxious, stressed, or unhappy about current work contribute to mental health concerns.[13] Additionally, a multivariable regression model showed that age, frontline COVID-19 prevention, and reasons such as insufficient income to cover living expenses, excessive work pressure, experiencing "Burnout" syndrome, feeling discriminated against for working in the healthcare environment, experiencing incidents due to witnessing loved ones and friends die from COVID-19 and experiencing incidents due to relatives losing their jobs were significantly associated with stress, anxiety, and depression ($p<0,01$).(7) On the other hand, factors related to work significantly influenced the mental health of healthcare workers in Italy after the COVID-19 pandemic, with depressive symptoms affecting 7,5 % of healthcare workers and psychological distress affecting 37,9 % of healthcare workers. 30,5 % of healthcare workers reported feeling discriminated against or experiencing differential treatment, while 5,7 % reported experiencing violence.[14] Factors such as working shifts during the pandemic, caring for COVID-19 patients, and the health status of healthcare workers are all related to mental health issues among healthcare professionals.[15] Additionally, factors such as poor family relationships, poor work relationships, experiencing major incidents in the past year, and conflict between work and family all increase the risk of stress by 1,96; 2,06; 2,37; and 2,69, respectively, among healthcare workers with similar circumstances.[16]

These figures indicate that the mental health of healthcare workers is alarmingly low. However, unlike other professional groups, healthcare workers are not diagnosed, and their health issues are not addressed during the pandemic period. Additionally, they may not recognize that they have health problems, especially those related to mental health. This affects the health of healthcare professionals and their motivation levels. Subsequently, patient care may be negatively affected. Increasing job-related stress translates into higher risks of sudden death and other illnesses among healthcare workers compared to other groups.[17] The history of medical personnel reacting to SARS demonstrates that the implications for medical personnel's mental health have not only short-term but also long-term consequences, and providing support and preparation is critical.[18]

At present, our research team can be considered one of the first to conduct this type of study in An Giang Province, the Vietnamese Mekong Delta region - an area with many healthcare challenges, and we hope to provide a comprehensive insight into the risk of mental health (issues of depression, anxiety, stress), and factors influencing the mental health status of grassroots healthcare workers. Through this research, we aim to provide scientific evidence to develop, plan, and implement mental healthcare policies for healthcare workers in the future.

METHOD

The research team invited 466 grassroots healthcare workers (including health centers and health stations) in An Giang Province to participate in the study with permission from relevant authorities (e.g., An Giang Department of Health, District/City Health Centers). Participants were thoroughly briefed on the study's objectives and content and voluntarily took part in the questionnaire survey. Given the sensitive nature of gathering personal views on their mental health, the research team committed to safeguarding information in line with professional ethics and incognito.

The research team visited each location to work with all participating grassroots healthcare workers, who the Depression Anxiety and Stress Scale 21 (DASS-21) web-based questionnaire was employed. DASS 21 consists of 21 items divided into 3 groups, each containing 7 items, and has been confirmed to be suitable for Vietnam. [19] Each item describes physical or mental symptoms. Points for each item range from 0 to 3, depending on the severity and duration of symptoms: 0 points - not at all correct; 01 point - partially correct, or occasionally correct; 02 points - mostly correct, or correct most of the time; 03 points - completely correct or correct most of the time. After totaling the points for each group of 07 items, the result is multiplied by 02. Then, DASS 21 uses the following severity assessment table:

Table 1. Guidelines for Anxiety, Stress, and Depression Scores

Level	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Very severe	≥28	≥20	≥34

Sourse: Adapted from Lovibond SH, Lovibond PF. Manual for the depression anxiety stress scales. 2nd ed. Sydney: Psychology Foundation of Australia; 1995.[20]

The authors conducted their research to identify variables influencing depression, anxiety, and stress, based on the actual situation in the surveyed areas and through reports from the local health sector. The influencing factors identified include physical health related to COVID-19 (Cronbach's Alpha coefficient is 0,83) with 3 items; self-care ability, psychological, and emotional aspects (Cronbach's Alpha coefficient is 0,69) with 5 items; workplace infrastructure (Cronbach's Alpha coefficient is 0,71) with 4 items; work relationships (Cronbach's Alpha coefficient is 0,66) with 5 items; salary and benefits (Cronbach's Alpha coefficient is 0,82) with 6 items; work related to COVID-19 (Cronbach's Alpha coefficient is 0,54) with 3 items, and job satisfaction with 1 item. A 5-point Likert scale (1 - Never/Completely untrue; 2 - Sometimes/Untrue; 3 - Occasionally/Half true - half untrue; 4 - Often/True; 5 - Always/Completely true) was used to measure the frequency of experiences of the subjects for each observed variable.

The quantitative data collected from valid and reliable questionnaires were input and analyzed using SPSS 25. The levels of depression, anxiety, and stress among grassroots healthcare workers, as self-evaluated, were analyzed to explore the relationships and interactions between independent and dependent variables. All analyses were set at a significance level of $p < 0,05$. Synthesis, analysis, and comparison methods were used to present the main research findings. We analyzed the determinant factors by employing multivariate logistic models.

The research was approved by the Ethics Committee of the Faculty of Social Sciences and Humanities, Ho Chi Minh City University of Social Sciences and Humanities, Vietnam (Number 1335/GXN-XHNV-ĐN and QLKH dated December 8, 2023). All participants provided their consent before participating in the survey.

RESULTS

The Levels of Anxiety, Stress, and Depression among Healthcare Workers at the Grassroots Level in the Post-COVID-19 Context

Table 2 indicates the levels of stress, anxiety, and depression among healthcare workers at the grassroots level in the post-COVID-19 context in An Giang Province. Currently, 18,3 % of healthcare workers are experiencing depressive disorders, with 8,2 % of them at a "mild" level, 7,1 % at a "moderate" level, 1,7 % at a "severe" level, and 1,3 % at a "very severe" level. Additionally, 28,8 % of healthcare workers are experiencing anxiety disorders, with 7,1 % at a "mild" level, 13,1 % at a "moderate" level, 3,9 % at a "severe" level, and 4,7 % at a "very severe" level. Regarding stress, 16,8 % of healthcare workers at the grassroots level have the disorder, with 7,3 % at a "mild" level, 5,8 % at a "moderate" level, 2,4 % at a "severe" level, and 1,3 % at a "very severe" level.

Table 2. The Rates of Anxiety, Stress, and Depression among Grassroots Healthcare Workers in the Post-COVID-19 Context

Level	Depression		Anxiety		Stress	
	Count	%	Count	%	Count	%
Normal	381	81,8	332	71,2	388	83,3
Mild	38	8,2	33	7,1	34	7,3
Moderate	33	7,1	61	13,1	27	5,8
Severe	8	1,7	18	3,9	11	2,4
Very severe	6	1,3	22	4,7	6	1,3
Total	466	100	466	100	466	100

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Factors Influencing Anxiety, Stress, and Depression among Grassroots Healthcare Workers

The results of the correlation analysis between influencing variables and depression, anxiety, and stress in table 3 indicate that factors related to physical health concerning COVID-19; workplace infrastructure; work relationships; and salary and benefits all have statistically significant correlations (p=0,05) with stress, anxiety, and depression among grassroots healthcare workers. Meanwhile, factors such as self-care ability, psychological, and emotional aspects, as well as job satisfaction, only show statistically significant correlations (sig<0,05) with stress and depression among grassroots healthcare workers. Additionally, the factor of work related to COVID-19 also only has a significant correlation (sig<0,05) with stress among grassroots healthcare workers.

In table 3, the strongest positive correlation is observed between the factor of physical health related to COVID-19 and anxiety (r=0,152, p=0,001), followed by the correlations between physical health related to COVID-19 and stress (r=0,131, p=0,004), work related to COVID-19 and stress (r = 0,110, p=0,017), and finally, physical health related to COVID-19 and depression (r=0,105, p=0,023). As for negative correlations, the strongest correlation is observed between the factor of salary and benefits and depression (r=-0,232, p=0,000), followed by the correlations between workplace infrastructure and stress (r=-0,225, p=0,000), work relationships and depression (r=-0,203, p=0,000), work relationships and stress (r=-0,202, p=0,000), salary and benefits and stress (r=-0,191, p=0,000), workplace infrastructure and anxiety (r=-0,187, p=0,000), workplace infrastructure and depression (r=-0,161, p=0,000), salary and benefits and anxiety (r=-0,154, p=0,001), job satisfaction and depression (r=-0,146, p=0,002), job satisfaction and stress (r=-0,144, p=0,002), self-care ability, psychological, and emotional aspects and depression (r=-0,121, p=0,009), and finally, self-care ability, psychological, and emotional aspects and stress (r=-0,108, p=0,020), and work relationships and anxiety (r=-0,108, p=0,020).

Table 3. Correlation Between Influencing Variables and Stress, Anxiety, Depression

Mental Health Status Influencing Physical Health Related to Covid-19		Factors						
		Self-care Ability, Psychological, Emotional Aspects	Job Nature	Workplace Infrastructure	Work Relationships	Salary and Benefits	Work Related to COVID-19	
Depression	r	,105*	-,121**	-,146**	-,161**	-,203**	-,232**	,070
	p	,023	,009	,002	,000	,000	,000	,132
Anxiety	r	,152**	-,083	-,064	-,187**	-,108*	-,154**	,079
	p	,001	,072	,165	,000	,020	,001	,088
Stress	r	,131**	-,108*	-,144**	-,225**	-,202**	-,191**	,110*
	p	,004	,020	,002	,000	,000	,000	,017

Note: * p<0,05, ** p<0,01

The Impact of Factors on the Depression Status of Grassroots Healthcare Workers

To explore the relationship between influencing factors and the depression status of grassroots healthcare workers, six factors including Physical Health, Self-care, Job Satisfaction, Workplace Infrastructure, Relationships, and Salary and Benefits were included in a Linear Regression model.

The regression analysis results indicate that the regression model between the depression status of grassroots healthcare workers and these factors is relatively appropriate to explain the influence of these factors on depression. The model is significant at the 1 % level (p=0,000) and accounts for 6,6 % of the variance in the depression status of grassroots healthcare workers, with the remaining percentage attributed to external variables and random error. Additionally, the test results show that five factors, Physical Health, Self-care, Job Nature, Workplace Infrastructure, and Relationships, do not significantly impact the dependent variable of depression among grassroots healthcare workers (p>0,05). However, in the model, only the Salary and Benefits variable has a significant inverse correlation and statistically significant impact on the depression status of grassroots healthcare workers (p=0,004). This means that if the salary and benefits in the job of grassroots healthcare workers are low or inadequate, it increases the likelihood of depression among them, and vice versa.

Table 4. Regression Analysis Results of the Impact of Factors on Depression Status

Model	Unstandardized Coefficients		Standardized Coefficients	Sig.	VIF
	B	Std. Error	Beta		
(Constant)	7,923	1,437		,000	
Physical Health	,126	,098	,059	,199	1,046
Self-care	-,287	,183	-,073	,118	1,074
Job Nature	-,035	,169	-,011	,838	1,349
Workplace Infrastructure	-,222	,209	-,053	,288	1,260

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Relationships	-,596	,389	-,084	,126	1,490
Salary and Benefits	-,517	,178	-,155	,004	1,420
Dependent Variable:	Depression Status of Grassroots Healthcare Workers				
R^2:	6,6 %				
Significance Level:	0,000				

The Influence of Factors on the Anxiety Status of Grassroots Healthcare Workers

The influence of factors on the anxiety status of grassroots healthcare workers was analyzed by including only four factors: Physical Health, Workplace Infrastructure, Relationships, and Salary and Benefits. The analysis showed that the Self-care Ability, Psychological, Emotional Aspects, and Job Satisfaction factors were not significantly correlated with anxiety among grassroots healthcare workers.

The regression analysis results presented in table 5 indicate that the regression model between these four factors and anxiety among grassroots healthcare workers is relatively appropriate. The model is significant at the 1 % level (p=0,000) and explains 5,1 % of the variance in anxiety status among grassroots healthcare workers. However, within the model, only the Physical Health and Workplace Infrastructure variables show significant correlation and statistical impact on the anxiety status of grassroots healthcare workers (p=0,007 and p=0,004, respectively).

The Standardized Coefficients of the Physical Health variable are positive, indicating that the physical health of grassroots healthcare workers can positively predict their anxiety levels. This suggests that better physical health (e.g., not being infected and not experiencing post-COVID-19 symptoms) among grassroots healthcare workers leads to reduced anxiety levels. Additionally, the Standardized Coefficients of the Workplace Infrastructure variable are negative, indicating that workplace infrastructure negatively predicts anxiety levels among grassroots healthcare workers. This implies that discomfort and inadequate workplace facilities and personal protective equipment worsen anxiety levels.

Table 5. Regression Analysis Results of the Impact of Factors on Anxiety Status among Grassroots Healthcare Workers

Model	Unstandardized Coefficients		Standardized Coefficients	Sig.	Variance Inflation Factor (VIF)
	B	Std. Error	Beta		
(Constant)	10,361	2,974		,001	
Physical Health	,558	,205	,125	,007	1,030
Workplace Infrastructure	-1,269	,437	-,146	,004	1,231
Relationships	-,012	,786	-,001	,988	1,361
Salary and Benefits	-,579	,366	-,083	,114	1,338
Dependent Variable:	Anxiety among Grassroots Healthcare Workers				
R^2:	5,1 %				
Significance Level:	0,000				

Influence of Factors on Stress Status of Grassroots Healthcare Workers

To explore the influence of factors on the stress status of grassroots healthcare workers, 07 initial factors related to stress were included in a linear regression analysis model. The results in table 6 indicate that factors concerning Physical Health; Working Conditions; Relationships; Salary and Benefits; Self-care; Job Nature; and COVID-19-related Work have predictive capabilities (7,0 %) for the stress status of grassroots healthcare workers. The analysis of variance (ANOVA) results achieved statistical significance with a p-value < 0,000, and the regression model did not violate the multicollinearity assumption as the tolerance of variables > 0,10 and the variance inflation factor (VIF) < 10,0. However, only the group of factors related to Working Conditions was found to have a significant correlation and impact on the stress of grassroots healthcare workers. With a Standardized Coefficients Beta coefficient of negative value (ß=-,145), it indicates that inadequate, unhygienic working conditions lacking sufficient equipment and personal protective gear lead to increased stress among grassroots healthcare workers.

Table 6. Regression Analysis Results of Factors and Stress Status of Grassroots Healthcare Workers

Model	Unstandardized Coefficients		Standardized Coefficients	Sig.	VIF
	B	Std. Error	Beta		
(Constant)	20,591	4,311		,000	
Physical Health	,457	,247	,086	,065	1,076
Working Conditions	-1,501	,520	-,145	,004	1,261

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Relationships	-1,497	,968	-,084	,123	1,490
Salary and Benefits	-,607	,450	-,073	,178	1,466
Self-care	-,492	,456	-,050	,281	1,075
Job Nature	-,028	,423	-,003	,948	1,368
COVID-19-related Work	,372	,579	,031	,520	1,152
Dependent Variable:	The Stress of Grassroots Healthcare Workers				
R2:	7,0 %				
Significance Level:	0,000				

DISCUSSION

These findings indicate that many grassroots healthcare workers in An Giang Province are facing mental health issues following the COVID-19 pandemic. This discovery also affirms the conclusions of many previous studies in various countries worldwide, such as the research conducted by Yasser Ghaleb, Faris Lami, et al;[21] Nguyen Thi Minh Phuong et al;[3] Nicholas W.S Chew et al;[22] Nay Phi La et al.[7] However, the rates of depressive and stress disorders among grassroots healthcare workers are lower compared to the study by Nguyen Thi Thanh Truc et al (the rates of stress and depression among nurses were 15,9 % and 24,5 %, respectively, but anxiety was higher in their study at 22,4 %).[8] Additionally, the results regarding stress among grassroots healthcare workers in this study are lower than the stress levels reported among frontline healthcare workers in Da Nang (44,6 %) and healthcare workers in Dak Lak Province (30,3 %) during the pandemic period.[4] This difference may be due to variations in the survey timing and the primary subjects providing information between the two studies. Particularly, our study was conducted after the end of the pandemic and life had returned to a more normal state. During this time, there was a better understanding of the transmission and spread of the virus, which may have reduced the fear and anxiety among healthcare workers.

Depression, anxiety, and stress among healthcare workers can stem from various factors such as personal, family, occupational, and societal ones. Previous studies on healthcare workers have revealed correlations between depression, anxiety, and stress with individual factors such as age, marital status, educational level, position, gender, poor family relationships, facing death, burnout, medical profession, less than one year of experience, university education, living with 4-5 people.[11,12,13] Our study did not investigate the relationship between individual factors, profession, and family but instead explored factors related to physical health; mental health care practices; workplace infrastructure; relationships with colleagues, superiors, patients; salary, and benefits during the new normal and post-COVID-19 pandemic. Linear regression analysis results confirmed that the factor of salary and benefits for grassroots healthcare workers had a statistically significant inverse correlation (p=0,004) with depression; the factor of physical health (p=0,007) had a positive correlation, and the working conditions factor (p=0,004) had a statistically significant inverse correlation with anxiety among grassroots healthcare workers; specifically, the factor of working conditions also had a statistically significant inverse correlation (p=0,004) with stress (p=0,004) among grassroots healthcare workers. These results indicate that low salaries, and inadequate benefits can increase the level of depression among healthcare workers, while being infected with COVID-19 and experiencing prolonged post-Covid symptoms may cause increased anxiety among healthcare workers, especially in workplaces lacking ventilation, adequate equipment, and personal protective gear, exacerbating anxiety and stress among healthcare workers. These findings are quite similar to the results of Vo Thi Lan Ket's study, which showed that the better the quality of life of nurses at Hospital X during the new normal period, the better their mental health, such as stress, anxiety, and depression.[23] This finding also reinforces the conclusion of Nay Phi La and colleagues that inadequate income is related to stress, anxiety, and depression (p<0,01).[7] Additionally, the authors also added that the workplace is also related to stress (p<0,05), and anxiety (p<0,01). Furthermore, the discovery regarding the physical health factor of healthcare workers is also confirmed to be related to their mental health issues in the study by Hien Thu Pham and colleagues (2023).[15]

Although the levels of stress, depression, and anxiety among grassroots healthcare workers in An Giang Province in the post-COVID-19 context have improved compared to the pandemic period, according to Fang X.H. et al, healthcare workers are perceived to provide better care for their patients if they feel treated fairly and respected.[24] Therefore, identifying the mental health status of healthcare workers and implementing mental healthcare programs for them in the future is essential to creating a supportive work environment. Especially, from 2023 to 2025, when the mental health care project for the population is being implemented in An Giang Province, grassroots healthcare workers require even more attention and mental health care first, before they can effectively provide mental health care for the population.

CONCLUSION

This study aims to explore the levels of stress, anxiety, depression, and the factors affecting stress, anxiety,

and depression among primary healthcare workers in An Giang province, located in the Mekong Delta region of Vietnam. The research results indicate that many primary healthcare workers in An Giang province experience mild to very severe disorders related to depression, anxiety, and stress. Factors related to salary and benefits, physical health, and workplace facilities were identified as influencing the mental health of primary healthcare workers. Among these, salary and benefits for primary healthcare workers were found to negatively predict the level of depression; physical health factors were positively predictive of the level of anxiety, and workplace facilities negatively predicted the levels of anxiety and stress among primary healthcare workers. Therefore, to mitigate the negative impacts of these influencing factors, the healthcare sector of the province needs to implement the following actions: Firstly, there should be specific and continuous policies and plans for the treatment and preventive care of mental and physical health for primary healthcare workers. Secondly, healthcare leaders should consider increasing salaries and allowances for primary healthcare workers and ensuring fairness in performance evaluation to provide appropriate incentives. Finally, a comfortable, open working environment and improved workplace facilities should be established at healthcare stations, especially those in rural and disadvantaged areas of the province.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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