Job-related Factors Associated with Depression, Anxiety, and Stress among Healthcare Workers in a Tertiary Government Hospital in Metro Manila during the COVID-19 Pandemic

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ABSTRACT

Background and Objectives. Ensuring the total well-being of healthcare workers (HCWs), including their mental health and psychological well-being, is an essential aspect in the delivery of patient care and the preservation of the health workforce. This study aimed to determine the level of mental well-being and emotional state of HCWs in terms of depression, anxiety, and stress using the DASS-21 scale in a tertiary government hospital during the COVID-19 pandemic in the Philippines and to identify the job-related factors that may be associated with these outcomes.

Methods. This is an analytical, cross-sectional study among HCWs involved in direct patient care in a tertiary government hospital in the Philippines during the COVID-19 pandemic. Data collection was conducted from February to March 2022 through an online self-administered questionnaire, which included the Demand-Control-Support Questionnaire (DCSQ), and the 21-item Depression Anxiety Stress Scale (DASS-21). This was sent to doctors, nurses, and allied medical workers actively working in the clinical areas. All responses were collected and analyzed.

Results. Three hundred sixty-four healthcare workers were included in the study. Majority were single (62.62%), living with immediate family (50.82%), and working in a COVID-designated area (62.09%). High prevalence of depression (49.18%), anxiety (61.54%), and stress (30.22%) was found among the HCWs. Work in high infection/COVID-designated areas was significantly associated with anxiety and stress, and high-job demand was significantly associated with all three mental health states compared to low job-demand.

Conclusion. Focus should be placed on modifying the condition of high job demand among healthcare workers working in hospitals. This includes ensuring optimum staffing levels and patient to HCW ratio which avoids HCWs from being subjected to high workloads and time pressures that subsequently increase risk for stress, anxiety, and depression.

Keywords: mental health, depression, anxiety, stress, healthcare workers, government hospital, COVID-19

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INTRODUCTION

The COVID-19 pandemic has highlighted the global interconnectedness of health issues, emphasizing the critical role and vulnerability of the health workforce. The United Nations' 2030 Agenda for Sustainable Development Goals (SDG) includes the protection of human rights, ensuring healthy lives and the promotion of safe working environments for all workers (SDGs 3 & 8). Yet, many healthcare workers

(HCWs) died or fell seriously ill, particularly during the early months of the pandemic. Past disease outbreaks have already shown that in the most seriously affected countries, the high mortality and morbidity of healthcare workers negatively impacted the overall functioning of health services.[1] It resulted in overwhelmed health systems, subsequently leading to mass fatalities.

The health workforce is the backbone of a health system. Unlike medicines and supplies that can be readily manufactured, it is impossible to produce competent and capable health workers on demand during times of crisis. It takes years of investment in education, careful planning for equity and sustainability, as well as a system of monitoring and evaluation to maintain competency and avoid attrition. Recognizing this reality amid worsening conditions during the pandemic, the World Health Organization (WHO) crafted the charter Health Worker Safety: A Priority for Patient Safety.[2] It emphasized the governments' legal and moral responsibility to protect health workers' physical safety as well as their mental well-being. The World Health Assembly (WHA) and International Labour Conference (ILC) have also reaffirmed the duty of governments, hospital administrators, and employers to protect the healthcare workforce, stating that protecting our healthcare workforce is an investment in the continuity of essential public health services to make progress towards universal health coverage and global health security.[3]

One key recommendation by the WHO is to "improve mental health and psychological well-being of health workers."[2] This is often neglected particularly in low- to middle-income countries. During the pandemic, hospitals gave much attention to establishing safety protocols yet failed to address or even recognize factors that threatened the mental health and well-being of its workers. WHO's recent World Mental Health Report[4] estimated 970 million cases of mental health disorders in 2019, with 301 million cases of anxiety disorder (31%) and 280 million depressive disorders (28.9%). It also stated a substantial increase in the global burden of disease for 2020 as a result of the pandemic.[4] Early in the pandemic, evidence from various systematic reviews showed that depression, anxiety, and stress were mental health problems experienced by HCWs.[5–7] For instance, a review conducted in countries including China, Singapore, India, and Hong Kong SAR found the prevalence of depression at 24.3% (95% CI 18.2-31.6%), anxiety at 25.8% (CI 20.5-31.9%), and stress at 45% (95% CI 24.3-67.5%) among hospital staff caring for COVID-19 patients.[7] Factors such as increased workloads, redeployment to unfamiliar settings and assignments, extreme fatigue and stigma from work and moral distress, isolation,[3] and the psychological aspects of job demand, job control, and social support have been identified to contribute to this rise in psychological strain.[8–10] Further studies have demonstrated that demand, control, and social support significantly impact outcomes like cardiovascular disease, musculoskeletal problems, psychosomatic complaints, job dissatisfaction, and aspects of mental health.[11–13]

In the Philippines, there is a paucity of data on the mental health status of HCWs during the pandemic. Thus, this study aimed to answer the questions: 1) What is the level of mental well-being and the emotional state of healthcare workers in terms of depression, anxiety, and stress in a tertiary hospital during the COVID-19 pandemic, and 2) What are the factors that may be associated with stress, anxiety, and depression? By determining the extent of these problems among HCWs, identifying vulnerable groups within this population, and exploring potentially modifiable factors, findings can provide valuable insights to provide support. Moreover, by focusing on areas often overlooked by other studies, such as sociodemographic factors and occupational conditions, this research could further enrich understanding around how HCWs are affected psychologically by their work environments amidst global crises like a pandemic. Ultimately, this study may inform more effective strategies for safeguarding HCW's well-being under challenging circumstances, which is vital not only for individual workers but also for the healthcare system overall.

METHODS

This research utilized an analytical, cross-sectional study design which involved healthcare workers in a tertiary government hospital and made use of a self-administered questionnaire. It was conducted from February to March 2022 in one of the largest government hospitals in the country, a 1,500-bed capacity tertiary government hospital in Manila. Early in the pandemic, in March 2020, it was officially designated as one of the first three COVID-19 referral centers by the Philippine government.

The survey was conducted online with a link to a questionnaire on Google Form sent through pertinent social media chat groups (i.e., Viber, Facebook Messenger, Whatsapp, Telegram) of doctors, nurses, and allied medical workers (i.e., radiation technologist, medical technologist, physical/occupational/speech therapist) actively working in the clinical areas of the hospital sent through the heads of the various units and departments of the hospital. Therefore, those with no internet access or social media account were automatically not included in the study since this was the main medium for recruitment and participation.

Stratified non-randomized sampling method was used based on the estimated percentage by category of healthcare workers working in the clinical areas. This was done to minimize possible bias brought about by clinical role or designation. The hospital had an estimated 2,100 of these healthcare workers working in the clinical areas at the time the study was conducted. The target sample size was 326, for 95% CI and margin of error at 5% as calculated on OpenEpi sample size calculator based on the estimated actual number of HCWs working in clinical areas at the time of the study. All respondents participated voluntarily and anonymously. Responses from consecutive participants from each category

were taken until the target number of respondents were reached. Any additional responses beyond the target number of samples per category were included in the data analysis. All healthcare workers that had no patient contact within the past month or had been working in the hospital for less than one month at the time the questionnaire was answered were excluded. No other criteria for exclusion were used; no attempt was made to identify or exclude those who have been diagnosed with clinically significant mental health problems prior to the study.

The self-administered questionnaire included the following: 1) the sociodemographic and occupational characteristics, 2) the Demand-Control-Support Questionnaire (DCSQ), and 3) the 21-item Depression Anxiety Stress Scale (DASS-21). The 21-item Depression Anxiety Stress Scale (DASS-21) is a short version of the 42-item Depression Anxiety Stress Scale, a three set self-report scale designed to measure the emotional states of depression, anxiety, and stress originally presented by Lovibond and Lovibond in 1995[14] while the English version of the 17-item DCSQ is a validated instrument used to study the psychosocial aspects of work[15]. Both the DCSQ and the DASS-21 scale portions were answered using a four-point Likert scale. Data collection started upon the approval of the protocol by a University-based Research Ethics Board (UPMREB 2021-0729-01). The self-administered questionnaire was sent through relevant internet based, social media chat groups, such as Viber, WhatsApp, Facebook Messenger, and Telegram. These were the popular social media messaging apps among the hospital HCWs during the time of the pandemic and were the primary means of communication among the HCWs at a time when social distancing was strictly enforced, and close personal contact and gatherings among individuals were prohibited. It was, therefore, the most efficient way of disseminating information at that time. Due to the availability of free internet within the hospital, communication among HCWs was done mainly thru these social media chat groups during the pandemic, and most, if not all, HCWs were on these platforms. As such, the use of the Google Form was viewed to have minimal selection bias at the time of the study.

For categorical data such as gender, marital status, household/family structure, and occupational characteristics, the descriptive analysis was presented in frequencies and percentages. For continuous data, they were summarized in means and standard deviations. For the primary outcome of level of depression, anxiety, and stress, the result of the DASS-21 was presented in absolute and relative frequencies according to the categories of normal-mild-moderate-severe-extremely severe.

For analysis of sociodemographic and occupational factors, job-related factors, job demand, job control, and job support, and their association with depression, anxiety, and stress, the one-way ANOVA, chi-square test, and Fisher's exact test were performed using STATA 12 software. Binary logistic regression was subsequently performed to measure the odds ratio with presence (i.e., mild, moderate, severe or extremely severe) or absence of depression as the outcome variable. For social support, which was studied as a modifying variable, stratified analysis was done to assess for effect measure modification of this variable. All results with $p<0.05$ were deemed statistically significant.

RESULTS

Three hundred eighty-one (381) healthcare workers of the hospital agreed to participate and submitted their responses to the questionnaire. Of these, only 364 met the inclusion criteria and were involved in direct patient care. Two hundred fifty-one (251) of the responses came from females while 113 came from males. The age range of the respondents was between 23-59 years old, with a mean age of 35 years. Majority of the respondents are single (62.62%), living with immediate family (50.82%), and work in a COVID-designated area (62.09%). Other characteristics of the sample are described as frequencies and percentages in Table 1.

The data for depression, anxiety, and stress scores were analyzed according to the recommended cutoffs for conven-

Table 1. Sociodemographic Characteristics of Respondents

Characteristic	Frequency (%) (n=364)
Sex	
Female	251 (68.96)
Male	113 (31.04)
Clinical role	
Nurse	186 (51.10)
Physician	138 (37.91)
Other Allied Medical Staff	40 (10.99)
Marital status	
Single	228 (62.62)
Married	122 (33.51)
Living with partner	7 (1.92)
Separated	4 (1.10)
Widow	3 (0.82)
Household structure	
Living alone	97 (26.65)
Living with immediate family	185 (50.82)
Living with extended family	33 (9.06)
Living in a boarding house	49 (13.46)
Clinical area assignment	
Emergency Room	37 (10.16)
Operating Room	108 (29.67)
Intensive Care Unit	16 (4.39)
Charity Ward	86 (23.63)
Private Ward	60 (16.48)
Outpatient Clinic	22 (6.04)
Diagnostic center/laboratory	13 (3.57)
Telemedicine	8 (2.10)
Others (PACU, Endoscopy unit, TCVS, Nuclear Med)	14 (3.85)
Work in COVID area	
Yes	226 (62.09)
No	138 (37.91)

tional severity labels of normal, mild, moderate, severe, and extremely severe. Table 2 summarizes the data in frequencies and percentages.

Overall, 49.18% of HCWs experienced mild to extremely severe depression, 61.54% felt mild to extremely severe anxiety, and 30.22% were under mild to extremely severe stress.

The association with the severity of depression of sociodemographic and job-related factors in terms of age, marital status, clinical role, work area, job demand, and job support were found to be statistically significant as shown in Table 3 (p-value<0.05). These factors were further analyzed using binary logistic regression, shown in Table 4.

Table 2. Severity of Depression, Anxiety, and Stress among Healthcare Workers

	Depression Frequency (%)	Anxiety Frequency (%)	Stress Frequency (%)
Normal	185 (50.82)	140 (38.46)	254 (69.78)
Mild	51 (14.01)	34 (9.34)	40 (10.99)
Moderate	83 (22.80)	102 (28.02)	37 (10.16)
Severe	15 (4.12)	41 (11.26)	23 (6.32)
Extremely severe	30 (8.24)	47 (12.91)	10 (2.75)

Table 4 shows that the odds of having depression decreases by 2% per year of increase in age. The odds of having depression among those with high-demanding jobs is 3.33 times higher (95% CI: 2.07 to 5.37) as compared to employees with low-demanding jobs. Job demand seems to be the only significant predictor of depression based on the given logistic regression model (p-values<0.05).

Table 5 shows the association with severity of anxiety of sociodemographic and job-related factors in terms of age, clinical role, work area, job demand, and job support were found to be statistically significant (p-value<0.05). Further binary logistic regression analysis is presented in Table 6.

Table 6 shows that the odds of having anxiety decreases by 3% per year increase in age. Those who were stationed in COVID areas are 1.60 times (95% CI: 1.01 to 2.55) more likely to experience anxiety as compared to employees stationed in a non-COVID area. The odds of having anxiety among those with high-demanding jobs is 2.71 times higher (95% CI: 1.71 to 4.29) as compared to employees with low-demanding jobs. Job demand and work area are the only significant predictors of anxiety (p-values<0.05).

Table 3. Sociodemographic and Job-related Factors Associated with the Presence of Depression (n=364)

	Severity of depression, Mean ± SD; Frequency (%)					*p*-value
	Normal	Mild	Moderate	Severe	Extremely severe	
Age	**36.97 ± 9.03**	**33.98 ± 8.82**	**33.11 ± 8.30**	**31.73 ± 6.88**	**30.10 ± 3.76**	**0.0001[1]**
Sex						
Male	58 (51.33)	16 (14.16)	24 (21.24)	4 (3.54)	11 (9.73)	0.950[2]
Female	127 (50.60)	35 (13.94)	59 (23.51)	11 (4.38)	19 (7.57)	
Length of Employment						
1 to 12 mos	26 (59.09)	4 (9.09)	11 (25.00)	1 (2.27)	2 (4.55)	0.698[3]
More than 12 mos	159 (49.69)	47 (14.69)	72 (22.50)	14 (4.38)	28 (8.75)	
Marital status						
Married	**79 (64.75)**	**19 (15.57)**	**20 (16.39)**	**2 (1.64)**	**2 (1.64)**	
Living with partner	**3 (42.86)**	**1 (14.29)**	**1 (14.29)**	**1 (14.29)**	**1 (14.29)**	**0.016[3]**
Single	**99 (43.42)**	**31 (13.60)**	**59 (25.88)**	**12 (5.26)**	**27 (11.84)**	
Separated	**3 (75.00)**	**0 (0)**	**1 (25.00)**	**0 (0)**	**0 (0)**	
Widow/widower	**1 (33.33)**	**0 (0)**	**2 (66.67)**	**0 (0)**	**0 (0)**	
Clinical role						
Physician	**49 (35.51)**	**20 (14.49)**	**36 (26.09)**	**10 (7.25)**	**23 (16.67)**	**0.0001[3]**
Nurse	**107 (58.15)**	**27 (14.67)**	**39 (21.20)**	**5 (2.72)**	**6 (3.26)**	
Allied health	**29 (69.05)**	**4 (9.52)**	**8 (19.05)**	**0 (0)**	**1 (2.38)**	
Work area						
COVID	**98 (43.36)**	**31 (13.72)**	**60 (26.55)**	**11 (4.87)**	**26 (11.50)**	**0.001[2]**
Non-COVID	**87 (63.04)**	**20 (14.49)**	**23 (16.67)**	**4 (2.90)**	**4 (2.90)**	
Job demand	**14.42 ± 1.84**	**15.41 ± 1.84**	**15.75 ± 1.63**	**16.20 ± 1.32**	**16.47 ± 1.83**	**0.0001[1]**
High	**87 (38.33)**	**33 (14.54)**	**65 (28.63)**	**15 (6.61)**	**27 (11.89)**	
Low	**98 (71.53)**	**18 (13.14)**	**18 (13.14)**	**0 (0)**	**3 (2.19)**	**0.0001[2]**
Job control	17.86 ± 2.10	17.88 ± 2.33	17.40 ± 2.16	17.33 ± 1.80	16.80 ± 2.30	0.075[1]
High	80 (57.55)	22 (15.83)	26 (18.71)	3 (2.16)	8 (5.76)	
Low	105 (46.67)	29 (12.89)	57 (25.33)	12 (5.33)	22 (9.78)	0.092[2]
Job support	**19.81 ± 2.60**	**17.82 ± 3.43**	**17.51 ± 2.90**	**16.60 ± 2.85**	**16.67 ± 2.48**	**0.0001[1]**
High	**105 (69.54)**	**14 (9.27)**	**24 (15.89)**	**3 (1.99)**	**5 (3.31)**	**0.001[2]**
Low	**80 (37.56)**	**37 (17.37)**	**59 (27.70)**	**12 (5.63)**	**25 (11.74)**	

Statistical tests used: 1 = One-way ANOVA; 2 = Chi-square test; 3 = Fisher's exact test
Boldface indicates significance at 0.05 α-level

Table 4. Multivariate Analysis of Sociodemographic and Job-related Factors Associated with the Presence of Depression

	Odds ratio	95% CI	*p*-value
Age	0.98	0.94 to 1.00	0.086
Marital status (baseline: married/living with partner)			
Single/separated/widow/widower	1.30	0.77 to 2.20	0.321
Clinical role (baseline: allied health)			
Nurse	1.15	0.53 to 2.50	0.716
Physician	1.86	0.80 to 4.35	0.150
Work area (baseline: non-COVID work area)	1.56	0.97 to 2.52	0.066
Stationed in COVID work area			
Job demand (baseline: low job demand)	**3.33**	**2.07 to 5.37**	**0.0001**
High job demand			

Statistical tests used: Binary logistic regression
Boldface indicates significance at 0.05 α-level

The association of severity of stress with sociodemographic and job-related factors in terms of age, marital status, clinical role, work area, job demand, and job support were the ones found to be statistically significant (p-value<0.05) as shown in Table 7. These factors were further analyzed using the binary logistic regression, shown in Table 8.

Table 8 shows that the odds of having stress decreases by 3% per year increase in age. Those who were stationed in a COVID ward are 2.73 (95% CI: 1.51 to 4.93) times more likely to experience stress as compared to employees stationed in a non-COVID area. The odds of having stress among those with high-demanding jobs is 3.59 (95% CI: 1.97 to 6.53) times higher as compared to employees with low-demanding jobs. Work area and job demand are the only significant predictors of stress (p-values<0.05).

The association between job demand and presence of depression, anxiety, and stress with job support as an effect modifier was also tested. The results are shown in Table 9.

All risk ratios are >1, therefore, the risk of having depression is higher among employees with highly demanding work compared to employees having low-demanding work for all levels of job support. Using the Mantel-Haenszel

Table 5. Sociodemographic and Job-related Factors Associated with the Presence of Anxiety (n=364)

	Severity of anxiety, Mean ± SD; Frequency (%)					*p*-value
	Normal	Mild	Moderate	Severe	Extremely severe	
Age	**36.76 ± 9.24**	**34.76 ± 8.84**	**34.37 ± 8.66**	**35.37 ± 8.54**	**30.09 ± 4.69**	**0.0002**[1]
Sex						
Male	40 (35.40)	9 (7.96)	37 (32.74)	13 (11.50)	14 (12.39)	0.721[2]
Female	100 (39.84)	25 (9.96)	65 (25.90)	28 (11.16)	33 (13.15)	
Length of Employment						
1 to 12 mos	18 (40.91)	3 (6.82)	14 (31.82)	5 (11.36)	4 (9.09)	0.871[2]
More than 12 mos	122 (38.13)	31 (9.69)	88 (27.50)	36 (11.25)	43 (13.44)	
Marital status						
Married	55 (45.08)	14 (11.48)	31 (25.41)	14 (11.48)	8 (6.56)	0.191[3]
Living with partner	3 (42.86)	0 (0)	0 (0)	1 (14.29)	3 (42.86)	
Single	79 (34.65)	20 (8.77)	68 (29.82)	25 (10.96)	36 (15.79)	
Separated	2 (50.00)	0 (0)	1 (25.00)	1 (25.00)	0 (0)	
Widow/widower	1 (33.33)	0 (0)	2 (66.67)	0 (0)	0 (0)	
Clinical role						
Physician	**42 (30.43)**	**8 (5.80)**	**41 (29.71)**	**14 (10.14)**	**33 (23.91)**	**0.0001**[2]
Nurse	**80 (43.48)**	**22 (11.96)**	**48 (26.09)**	**22 (11.96)**	**12 (6.52)**	
Allied health	**18 (42.86)**	**4 (9.52)**	**13 (30.95)**	**5 (11.90)**	**2 (4.76)**	
Work area						
COVID	**73 (32.30)**	**24 (10.62)**	**62 (27.43)**	**30 (13.27)**	**37 (16.37)**	**0.005**[2]
Non-COVID	**67 (48.55)**	**10 (7.25)**	**40 (28.99)**	**11 (7.97)**	**10 (7.25)**	
Job demand	**14.43 ± 1.82**	**14.62 ± 2.16**	**15.29 ± 1.73**	**15.51 ± 1.66**	**16.70 ± 1.50**	**0.0001**[1]
High	**65 (28.63)**	**17 (7.49)**	**73 (32.16)**	**29 (12.78)**	**43 (18.94)**	
Low	**75 (54.74)**	**17 (12.41)**	**29 (21.17)**	**12 (8.76)**	**4 (2.92)**	**0.0001**[2]
Job control	17.66 ± 2.39	17.71 ± 2.12	17.73 ± 2.01	17.78 ± 1.90	17.30 ± 2.08	0.820[1]
High	55 (39.57)	13 (9.35)	40 (28.78)	17 (12.23)	14 (10.07)	
Low	85 (37.78)	21 (9.33)	62 (27.56)	24 (10.67)	33 (14.67)	0.789[2]
Job support	**19.65 ± 2.95**	**18.82 ± 3.08**	**18.26 ± 2.79**	**17.66 ± 2.89**	**16.98 ± 2.97**	**0.0001**[1]
High	**76 (50.33)**	**17 (11.26)**	**36 (23.84)**	**10 (6.62)**	**12 (7.95)**	
Low	**64 (30.05)**	**17 (7.98)**	**66 (30.99)**	**31 (14.55)**	**35 (16.43)**	**0.0001**[2]

Statistical tests used: 1 = One-way ANOVA; 2 = Chi-square test; 3 = Fisher's exact test
Boldface indicates significance at 0.05 α-level

Table 6. Multivariate Analysis of Sociodemographic and Job-related Factors Associated with the Presence of Anxiety

	Odds ratio	95% CI	p-value
Age	0.97	0.95 to 1.00	0.075
Clinical role (baseline: allied health)			
Nurse	0.70	0.34 to 1.43	0.324
Physician	0.83	0.37 to 1.87	0.654
Work area (baseline: non-COVID work area)			
Stationed in COVID work area	**1.60**	**1.01 to 2.55**	**0.047**
Job demand (baseline: low job demand)			
High job demand	**2.71**	**1.71 to 4.29**	**0.0001**

Statistical tests used: Binary logistic regression
Boldface indicates significance at 0.05 α-level

adjustment, it was found that the risk of having depression is 1.90 (95% CI: 1.43 to 2.52) times greater for employees with highly demanding work compared to employees with low-demanding work after accounting for job support levels. Test of homogeneity has a p-value >0.05, therefore there is insufficient evidence that job support modifies the association between job demand and depression.

Similar statistical analysis was done for data for both anxiety and stress as shown in Tables 10 and 11, with tests for homogeneity showing insufficient evidence that job support modifies the association between job demand and anxiety, as well as job demand and stress.

DISCUSSION

The results of this study among HCWs show a much higher prevalence of depression, anxiety, and stress compared to a local study conducted among the general population in the Philippines.[16] Likewise, compared to a systematic review on HCWs caring for COVID-19 patients from the Middle East, Europe, and Africa during the first year of the pandemic that showed 24.3% and 25.8% prevalence rates for depression and anxiety, respectively, our findings show a higher rate.[7]

Consistent with the conclusions of Salari, HCWs in hospitals caring for COVID-19 patients have a higher

Table 7. Sociodemographic and Job-related Factors Associated with the Presence of Stress (n=364)

	Severity of stress, Mean ± SD; Frequency (%)					*p*-value
	Normal	Mild	Moderate	Severe	Extremely severe	
Age	**36.29 ± 9.07**	**33.60 ± 8.32**	**31.22 ± 7.11**	**29.78 ± 3.40**	**29.60 ± 1.71**	**0.0001[1]**
Sex						
Male	79 (69.91)	15 (13.27)	10 (8.85)	5 (4.42)	4 (3.54)	0.670[2]
Female	175 (69.72)	25 (9.96)	27 (10.76)	18 (7.17)	6 (2.39)	
Length of Employment						
1 to 12 mos	30 (68.18)	4 (9.09)	7 (15.91)	2 (4.55)	1 (2.27)	0.734[2]
More than 12 mos	224 (70.00)	36 (11.25)	30 (9.38)	21 (6.56)	9 (2.81)	
Marital status						
Married	**102 (83.61)**	**9 (7.38)**	**7 (5.74)**	**3 (2.46)**	**1 (0.82)**	**0.033[2]**
Living with partner	**4 (57.14)**	**1 (14.29)**	**1 (14.29)**	**1 (14.29)**	**0 (0)**	
Single	**142 (62.28)**	**29 (12.72)**	**29 (12.72)**	**19 (8.33)**	**9 (3.95)**	
Separated	**4 (100)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	
Widow/widower	**2 (66.67)**	**1 (33.33)**	**0 (0)**	**0 (0)**	**0 (0)**	
Clinical role						
Physician	**71 (51.45)**	**17 (12.32)**	**21 (15.22)**	**21 (15.22)**	**8 (5.80)**	**0.0001[2]**
Nurse	**150 (81.52)**	**19 (10.33)**	**11 (5.98)**	**2 (1.09)**	**2 (1.09)**	
Allied health	**33 (78.57)**	**4 (9.52)**	**5 (11.90)**	**0 (0)**	**0 (0)**	
Work area						
COVID	**136 (60.18)**	**34 (15.04)**	**27 (11.95)**	**21 (9.29)**	**8 (3.54)**	**0.0001[2]**
Non-COVID	**118 (85.51)**	**6 (4.35)**	**10 (7.25)**	**2 (1.45)**	**2 (1.45)**	
Job demand	**14.69 ± 1.84**	**15.90 ± 1.35**	**15.57 ± 1.98**	**16.43 ± 1.67**	**17.80 ± 1.32**	**0.0001[1]**
High	**135 (59.47)**	**35 (15.42)**	**27 (11.89)**	**20 (8.81)**	**10 (4.41)**	
Low	**119 (86.86)**	**5 (3.65)**	**10 (7.30)**	**3 (2.19)**	**0 (0)**	**0.0001[2]**
Job control	17.82 ± 2.12	17.35 ± 2.37	17.35 ± 2.14	17.09 ± 2.13	16.90 ± 2.33	0.211[1]
High	107 (76.98)	12 (8.63)	12 (8.63)	6 (4.32)	2 (1.44)	
Low	147 (65.33)	28 (12.44)	25 (11.11)	17 (7.56)	8 (3.56)	0.209[2]
Job support	**19.18 ± 2.89**	**17.27 ± 3.05**	**17.62 ± 3.47**	**17.13 ± 2.28**	**16.70 ± 3.02**	**0.0001[1]**
High	**122 (80.79)**	**9 (5.96)**	**11 (7.28)**	**5 (3.31)**	**4 (2.65)**	
Low	**132 (61.97)**	**31 (14.55)**	**26 (12.21)**	**18 (8.45)**	**6 (2.82)**	**0.002[2]**

Statistical tests used: 1 = One-way ANOVA; 2 = Fisher's exact test
Boldface indicates significance at 0.05 α-level

Table 8. Multivariate Analysis of Sociodemographic and Job-related Factors Associated with the Presence of Stress

	Odds ratio	95% CI	*p*-value
Age	0.97	0.93 to 1.01	0.110
Marital status (baseline: married/living with partner)			
Single/separated/widow/widower	1.33	0.72 to 2.47	0.359
Clinical role (baseline: allied health)			
Nurse	0.49	0.20 to 1.21	0.123
Physician	1.21	0.46 to 3.18	0.692
Work area (baseline: non-COVID work area)			
Stationed in COVID work area	**2.73**	**1.51 to 4.93**	**0.001**
Job demand (baseline: low job demand)			
High job demand	**3.59**	**1.97 to 6.53**	**0.0001**

Statistical tests used: Binary logistic regression
Boldface indicates significance at 0.05 α-level

Table 9. Association between Job Demand and Presence of Depression, with Job Support as Effect Modifier

Job-related factors	Risk ratio	95% CI
High job demand * high job support	1.95	1.16 to 3.27
High job demand * low job support	1.88	1.34 to 2.62
Mantel-Haenszel adjusted (combined)	1.90	1.43 to 2.52

Test of homogeneity (chi-square): p-value = 0.900
Statistical test used: Test for effect measure modification

Table 10. Association between Job Demand and Presence of Anxiety, with Job Support as Effect Modifier

Job-related factors	Risk ratio	95% CI
High job demand * high job support	1.40	1.01 to 1.94
High job demand * low job support	1.55	1.19 to 2.03
Mantel-Haenszel adjusted (combined)	1.49	1.21 to 1.83

Test of homogeneity (chi-square): p-value = 0.621
Statistical test used: Test for effect measure modification

Table 11. Association between Job Demand and Presence of Stress, with Job Support as Effect Modifier

Job-related factors	Risk ratio	95% CI
High job demand * high job support	1.98	0.99 to 3.97
High job demand * low job support	3.58	1.84 to 6.97
Mantel-Haenszel adjusted (combined)	2.84	1.75 to 4.61

Test of homogeneity (chi-square): p-value = 0.220
Statistical test used: Test for effect measure modification

prevalence of behavioral disorders[7] and therefore need particular attention and possible interventions from both hospital administrators and policy makers. This may especially be true during long drawn pandemic situations, as this study shows higher prevalence rate two years into the pandemic compared to previous studies conducted within a year of the onset of the pandemic.

Earlier studies consistently revealed that females, nurses, and work in areas of high infection rate are associated with higher risk for depression, anxiety, and stress.[5,17–22] In contrast, this study shows no significant difference in depression, anxiety, and stress in males and females. This does not support the findings conducted within the first year of the pandemic that showed consistently higher risk of stress in females compared to males.[5,17–21] It suggests that as the pandemic becomes long drawn, the risk of stress, as well as depression and anxiety, become similar for both males and females; therefore, all genders should be given the same attention with regard to their mental health.

Working in areas of higher infection rate was consistently seen to be significantly associated with stress, depression, and anxiety in earlier studies.[5,17,22,23] Similarly, the results show significant association between work in COVID-designated areas and increased prevalence of depression, anxiety, and stress. This finding should prompt hospital managers to judiciously monitor work assignments and institute regular and mandatory rotation of personnel particularly for those working in highly infectious areas.

Regarding job-related factors, only job demand was found to be consistently associated with the presence of depression, anxiety, and, stress, while job control had no significant effect on all three. This result is consistent with one of the key findings of Kinman in 2020 relating increased rates of poor mental health to increasing job demands. Work shifts, workloads, and long working hours with staffing shortages have been consistent predictors of stress even prior to the COVID-19 pandemic.[24–28] The demanding workloads, together with limited time and opportunity for rest and recovery may be detrimental to mental health and well-being of HCWs. As three out of the five questions on job demand pertain to how fast, intense, or hard one must work while on the job, it seems that the amount and type of work HCWs are faced with plays a significant factor in their state of mental health. Moreover, work that exposes them to traumatic experiences have also been found to increase post-traumatic stress symptoms, with repeated exposures having been found to have a cumulative effect.[28]

However, it should be noted that this study does not take into account the physical demands at work, nor the amount of time spent at work, which have consistently been found to be a significant predictor of stress in previous studies.[24–27]

Contrary to previous findings that a supportive work environment can attenuate the effects of traumatic events and work demands,[28] the result of this study tells otherwise. However, during the time of the pandemic, social distancing was enforced, and close personal contact was prohibited within the hospital; as such, social support as stated in the questionnaire as having good relationship and understanding with superiors and co-workers and a pleasant work environment may not have played a significant factor. Studies during the pandemic showed that systemic support, such as the provision of adequate personal protective

equipment and knowledge, protected against adverse mental health outcomes.[5] In the hospital, HCWs were provided with housing and transportation needs at the height of the pandemic, along with additional financial compensation from the government. Another aspect which the study was not able to take into account was virtual social support, which includes online wellness sessions and counselling provided by the hospital. These systemic support factors may have played a greater role in modifying mental health outcomes and should be further investigated in the future.

The significant association between job demand and depression, anxiety, and stress revealed in this study means that the focus should be placed on modifying aspects of work related to increased job demand. This could be done by ensuring optimum staffing-levels and patient to HCW ratio. Hospitals should also ensure that the HCWs are competent and adequately equipped to handle the job they are designated to perform. Understaffing has been reported to result in high workloads and time pressures, increasing fatigue, and stress for HCWs.[29] Because attrition may be high and may lead to understaffing, it is also important for hospital officials to provide adequate compensation plus other incentives to retain HCWs. For those working in clinical areas with a higher likelihood of traumatic experiences, such as the intensive care unit and emergency room department, it may be helpful to have a scheme of rotation so as not to burden them continuously. Administrators should also ensure that HCWs are given adequate breaks during a work shift to provide sufficient time for rest and recovery.

The study results indicate no significant association between job control and depression, anxiety, and stress. This does not support a previous similar study where employees with higher perceived control reported lower levels of emotional distress,[30] as well as a systematic review conducted in 2021 concluding that increasing control and opportunities for workers' voice and participation reliably improve worker well-being.[31] The limitation of this study is that it does not investigate other factors as confounders and modifiers impacting the effect of job control and demand on depression, anxiety, and stress, apart from job support. These additional factors could potentially influence said effects on mental health outcomes.

CONCLUSION

This study on HCWs of a tertiary government hospital in the Philippines involved in direct patient care during the COVID-19 pandemic revealed a high prevalence of depression, anxiety, and stress. The rates are higher than previously reported in local and international studies and should serve as a clear warning to policy makers and hospital administrators. The mental health problem is a true and serious threat to the safety and well-being of our HCWs, and therefore is also a threat to patient safety and the resilience of our health system.

Regarding the association of sociodemographic factors, work in a COVID/high infection area was the only factor shown to be significant and was only associated with the occurrence of anxiety and stress but not with depression. Therefore, hospital administrators and managers should judiciously monitor work assignments and institute regular and mandatory rotation of personnel.

In terms of job-related factors, job demand was consistently associated with and shown to be a significant predictor of depression, anxiety, and stress. Moreover, our investigation into the association between job demand and mental health outcomes with job support as an effect modifier showed that job support does not modify the risk for depression, anxiety, and stress among HCWs with high job demand. This means that rather than putting much focus on instituting programs to foster a highly supportive work environment, attention should be placed on modifying aspects of work related to increased job demand. It is recommended that the hospital administrators ensure optimum staffing levels and patient to HCW ratio. This avoids HCWs from being subjected to high workloads and time pressures that subsequently increase risk for stress, anxiety, and depression. Administrators should also ensure that the HCWs are competent and adequately equipped to handle the job they are designated to perform. This starts from hiring of individuals with the appropriate knowledge and skill set for the job that is required of them and continuously providing them with education and training once employed.

The healthcare workforce is one of the essential building blocks of a strong and resilient healthcare system which is what is needed during pandemics and other health crises events. Ensuring health workforce safety, protection, mental health, and well-being should always be given priority by governments and policy makers, particularly those working to achieve Universal Health Care.

Statement of Authorship

Both authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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