Mental Health Outcomes Among Health Care Workers Exposed to Covid-19 in a Tertiary Government Hospital*

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ABSTRACT

BACKGROUND

The Coronavirus disease 2019 (COVID-19) is a major health crisis that affected 32 million people to date and caused death to 990,000 individuals. The impact of this pandemic on the healthcare system took its toll especially to the healthcare workers and its effect on their physical and mental health. We aim to assess severity of generalized anxiety, depression and subjective distress among medical, allied and ancillary healthcare workers (HCWs) who handled COVID-19 patients.

METHODOLOGY

This is a cross sectional, survey based study done from July1 to August 31, 2020 involving healthcare workers who handled COVID-19 patients in a tertiary hospital in Pangasinan. The self-administered questionnaires used were the Generalized Anxiety Disorder- 7 for generalized anxiety, Patient Health Questionnaire (PHQ-9) for depression and Impact of Events Scale−Revised (IES-R) for subjective distress.

RESULTS

A total of 417 of 450 contacted individuals completed the survey, with a participation rate of 92.67%. Majority were women (64.57%) and 53.24% were aged 19 to 30 years old. Sixty percent of the respondents were nurses, 25.9% were physicians and the rest were composed of medical technologists (6.47%), radiologic technologists (5.52%) and respiratory therapists (1.68%). Subjective distress was noted to be present in 253 (60.67%) healthcare workers followed by anxiety 224 (53.72%) and depression 184 (44.12%). Allied health professionals and male participants experienced anxiety the most as well as subjective distress. Depression was more severe among physicians (2 [1.85%]) and women (3 [1.1%]). Physicians and allied health professionals reported more severe degrees of mental health symptoms compared to nurses.

CONCLUSION

In this study, a significant proportion of HCWs especially physicians and allied health professionals involved in handling and treating suspected and confirmed COVID-19 patients experienced generalized anxiety, depression and distress.

Keywords: COVID-19, Coronavirus, Depression, Stress, Anxiety, mental health, healthcare workers (HCWs)

INTRODUCTION

According to Centers for Disease Control and Prevention, pandemic is defined as constant presence and/or usual prevalence of a disease or infectious agent that has spread over several countries or continents, usually affecting a large number of people.[1] The World Health Organization (WHO) declared coronavirus disease 2019 (COVID-19) outbreak a public health emergency of international concern when all 34 regions of China had cases of infection and the total case count surpassed that for the Severe Acute Respiratory Syndrome (SARS) of 2003.[2] On March 11, 2020, COVID-19 was declared a pandemic. COVID-19 is a major health concern affecting several nations, currently with over 31, 361, 979 cases and 965,

642confirmed death.[3] To date, there are about 291, 789 confirmed cases and 5, 049 deaths reported in the Philippines.[4] Infection with COVID-19 is characterized by fever, dry cough, sore throat, fatigue and difficulty of breathing. Recent reports have shown that 80% of patients with the disease have mild symptoms and will recover. Mortality rate is low at 2.3%[5], but because of the high transmission rate, total mortality from COVID-19 surpassed that of SARS and Middle East Respiratory Syndrome coronavirus (MERS-CoV) combined.[6]

As COVID-19 pandemic was declared, it brought not only death from the viral infection but also unbearable psychological pressure and mental health problems especially to health care workers.[7] Studies show that the infection rate of medical staff during the SARS and MERS outbreaks reached 21% and 18.6%, respectively, which resulted in adverse psychological effects, including anxiety and depression.[8] The unpredictability and uncertainty of pandemic outbreak of infectious disease from its clinical presentation, rapid transmission pattern, seriousness of public health impact and implication for international public health and underprepared health facilities to address the pandemic outbreak of COVID-19 has considerably high potential for psychological fear contagion. This result in prevalent multitude of psychological problems including fear, anxiety, stigma, prejudice, marginalization towards the disease and its relation to all people ranging from healthy to at-risk individuals to health care workers.[9] It is pivotal therefore not to neglect psychological impact of the outbreak to individuals and society, which is often the limiting factor for the nation to overcome the crisis. Even after the pandemic has ended, psychological ramifications can be long-lasting.[10]

The stress that health care workers are dealing with includes perceived risk of infection to themselves and their families, patient mortality and availability of effective protective equipment as well as clear infection control guidance. Evidence-based evaluations and mental health interventions targeting front-line health care workers are relatively scarce. In the province of Pangasinan, where COVID-19 is being handled by secondary and tertiary hospitals, healthcare workers are faced with the same stressors. To address this gap, this study aims to evaluate the mental health outcomes among healthcare workers exposed to COVID-19 by quantifying the magnitude of symptoms of generalized anxiety, depression and subjective distress in this time of pandemic.

OBJECTIVES

General: To assess mental health outcomes among healthcare workers exposed to COVID-19 in a tertiary hospital in Pangasinan.

Specific:
1. To assess severity of generalized anxiety, depression and subjective distress among medical, allied and ancillary healthcare workers who handled confirmed, suspected and probable COVID-19 patients.

2. To compare the severity of generalized anxiety, depression and subjective distress among medical, allied and ancillary healthcare workers who handled confirmed, suspected and probable COVID-19 patients in a tertiary hospital in Pangasinan.

SIGNIFICANCE OF THE STUDY

This pandemic has highlighted the fragility of mental resilience and the need for the provision of coordinated psychological intervention. Identifying vulnerable groups susceptible to psychological distress and strengthen their psychological defense by counseling services and development of support system among colleagues can aid us in fighting this long-drawn battle and secure success for the future.

Definition of Terms
1. Mental health- a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community.[11]

2. COVID-19- stands for coronavirus disease 2019 caused by the SARS-CoV-2 (2019-nCoV) virus.[12]

3. Confirmed case - A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.[12]

4. Suspected case[12]
   a. Patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness of breath), and a history of travel to or residence in a location reporting community transmission of COVID-19 disease during the 14 days prior to symptom onset

   b. Patient with any acute respiratory illness and having been in contact with a confirmed or probable COVID-19 case in the last 14 days prior to symptom onset

   c. A patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath; and requiring hospitalization) and in the absence of an alternative diagnosis that fully explains the clinical presentation.

5. Probable case[12]
   a. A suspect case for whom testing for COVID-19 is inconclusive.

   b. A suspect case for whom testing could not be performed for any reason.

6. Exposed to COVID-19 – healthcare workers who underwent on duty at Isolation/COVID ward, involved in handling suspected and confirmed COVID-19 patients and those involved in the triage areas

REVIEW OF RELATED LITERATURE

Pandemics are large-scale outbreaks of infectious disease that can greatly amplify morbidity and mortality over a wide geographic area. Economic, social, and political disruption are significant effects of the pandemic. [13] Increased global travel and integration, urbanization, changes in land use, and greater exploitation of the natural environment may have contributed to the increased likelihood of pandemics over the past century [14, 15] The world has endured several notable pandemics which include Black Death, Spanish flu, SARS, Zika virus and human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and currently the COVID-19.[1]

COVID-19 is an enveloped, positive single-strand RNA virus. It belongs to the Orthocoronavirinae subfamily, with the characteristic crown-like spikes on their surfaces.[16] The mean incubation period is 5.2 days.[17] The most common signs and symptoms are fever (83%−98%), cough (76%−82%), and shortness of breath (31%−55%). It is crucial to trace the travel and exposure history following 14 days before onset of symptoms in diagnosing COVID-19 since the signs and symptoms are non-specific.[18] In a number of patients, there is progression of the condition to acute respiratory distress syndrome wherein patients worsen in a short period of time and die of multiple organ failure.[18,19] Laboratory diagnosis include clinical specimen (nasopharyngeal swab, sputum, or lower respiratory tract aspirates, etc.) that were isolated and identified as 2019-nCoV or a positive RT-PCR. [20, 21]

For COVID-19, fear has promulgated due to its unparalleled magnitude of spread and rate of transmission. There is more intensified psychological fear now as compared to 17 years ago during the SARS period, which may be related to increased air travel and enhanced global connectedness making an effortless spread of the pandemic.[22] Increased propagation of fear potentially leads to erratic behavior among people amidst infectious outbreaks and play a major role on how people respond to such crisis.[23] Extensive media coverage, serving as a tool in boosting precautionary and preventive measures may inevitably amplify the apprehension of the public's physical and psychological response to the infectious disease threat.[24]

Facing this critical situation, front line health care workers who are directly involved in the diagnosis, treatment, and care of patients with COVID-19 are at risk of developing psychological distress and other mental health symptoms. Overwhelming workload, depletion of personal protection equipment, loneliness, separation from family and feelings of being inadequately supported may all contribute to the mental burden of these health care workers.[25]

In a study by Wang et.al. among health workers in China during the initial outbreak of COVID-19, 16.5% reported moderate to severe

depressive symptoms, 28.8% had moderate to severe anxiety symptoms and 8.1% had moderate to severe stress levels.[23] Increased levels of stress and anxiety to health care workers are also related to social stigmatization and contact with infected patients.[26] During the outbreaks of SARS and MERS-CoV, healthcare workers had reported high levels of stress that resulted in post-traumatic stress disorder (PTSD).[26, 27] Risk factors of psychological stress among medical practitioners include perception of their risk of infection, the impact of disease on their work, feelings of depression and working in high-risk medical units.[28]

Mental health problems affecting the decision-making ability of medical workers may have long term detrimental effect on their overall well-being.[29] The long-term mental health impact of COVID- 19 may take weeks or months to become fully apparent, and managing this impact requires concerted effort not just from psychiatrists but from the health care system at large.[30] Stigmatization, discrimination and fear of labeling may potentially hinder healthcare workers to ask for counseling and psychosocial interventions.[31] Working under high stress environment, the emotional and behavioral responses of the health care workers are naturally adaptive in the face of extreme (unpredictable and uncertain) stress, and thus counseling and psychotherapy based on the stress-adaptation model might act as early and prompt intervention. Protecting health care workers is an important component of public health measures for addressing the COVID-19 epidemic.[25]

METHODOLOGY

4.1 Study Design

This is a cross- sectional study which utilized validated and self-administered questionnaires. Data collection was from July 1 to August 31, 2020.

4.2 Participants

417 HCWs (doctors, nurses, respiratory therapists, radiologic and medical technologists) involved in handling suspected and confirmed COVID-19 patients in Region I Medical Center, Dagupan City, Pangasinan were targeted to achieve 5% margin of error at 95% confidence interval. The target sample size of participants was determined using the formula $N = Z\alpha^2 P (1 - P) / d^2$, in which $\alpha = 0.05$ and $Z\alpha = 1.96$, and the estimated acceptable margin of error for proportion d was 0.1. The proportion of health care workers with psychological comorbidities was estimated at 35%, based on a previous study of the SARS outbreak.[32] Informed consent was obtained from health care workers who participated in the survey. This study was approved by the Ethics Review board of Region I Medical Center (R1MC).

4.3 Outcomes

Basic demographic data were gathered which include gender, age, marital status, number of children, educational attainment and occupation. The number of children, senior citizens, pregnant and household members with comorbidities, the number of years of service to the hospital and the length of time in handling suspected and confirmed COVID-19 patients were also obtained.

The questionnaires used include Generalized Anxiety Disorder- 7 for generalized anxiety, Patient Health Questionnaire (PHQ-9) for depression and Impact of Events Scale–Revised (IES-R) for subjective distress.

Patient Health Questionnaire (PHQ-9)

The 9- item Patient Health Questionnaire is a self-report measure used to assess the severity of depression. Respondents are asked how much each symptom has bothered them over the past 2 weeks, with response options of "not at all", "several days", "more than half the days", and "nearly every day", scored as 0, 1, 2, and 3, respectively. The total scores are categorized as follows: minimal/no depression (0−4), mild depression (5−9), moderate depression (10−14), moderately severe (15-19) and severe depression (20-27). [33]

The diagnostic validity of the 9-item PHQ-9 was recognized in studies including 8 primary care and 7 obstetrical clinics. PHQ-9 scores > 10 had a sensitivity of 88% and a specificity of 88% for Major Depressive Disorder. Reliability and validity of the tool have indicated it has sound psychometric

properties. Internal consistency of the PHQ-9 has been shown to be high.[34] A study involving two different patient populations produced Cronbach alphas of .86 and .89. Criteria validity was established by conducting 580 structured interviews by a mental health professional. Results from these interviews showed that individuals who scored high (≥ 10) on the PHQ-9 were between 7 to 13.6 times more likely to be diagnosed with depression by the mental health professional. Meanwhile, individuals scoring low (≤ 4) on the PHQ-9 had a less than a 1 in 25 chance of having depression.[35]

Generalized Anxiety Disorder (GAD-7)

The 7- item Generalized Anxiety Disorder is a self-rated scale to evaluate the severity of anxiety and has good reliability and validity. A 7-item questionnaire that asked patients how often, during the last 2 weeks, they were bothered by each symptom. Response options were "not at all," "several days," "more than half the days," and "nearly every day," scored as 0, 1, 2, and 3, respectively. The total scores are categorized as follows: minimal/no anxiety (0−4), mild anxiety (5−9), moderate anxiety (10−14), or severe anxiety (15−21).[36]

The GAD-7 is a valid and efficient tool for screening for general anxiety disorder and assessing its severity in clinical practice and research in the general population. It has a good reliability, as well as criterion, construct, factorial, and procedural validity with sensitivity of 89% and specificity of 82%.[37,38] On the other hand, in a systematic review and diagnostic meta-analysis of five thousand two hundred twenty-three participants, 11 out of 12 samples identified provided data on the accuracy of the GAD-7 for identifying generalized anxiety disorder.[39]

Impact of Event Scale-Revised (IES-R)

The 22- item Impact of Event Scale-Revised is a self-report measure used to assess the degree of subjective distress of the participants in response to a specific traumatic event, especially in the response sets of intrusion (intrusive thoughts, nightmares, intrusive feelings and imagery, dissociative-like re-experiencing), avoidance (numbing of responsiveness, avoidance of feelings, situations, and ideas), and hyperarousal (anger, irritability, hypervigilance, difficulty concentrating, heightened startle). The total scores are categorized as follows: subclinical (0−8), mild distress (9−25), moderate distress (26−43), and severe distress (44−88).[40]

The IES-R was designed and validated using a specific traumatic event as a reference in the directions to the individual while administering the tool and while using a specific time frame of the past seven days. The scale discriminates between different types of traumatized groups from non-traumatized groups in general population studies. The subscales of avoidance and intrusion show good internal consistency. The IES-R has been extensively evaluated in many languages.[41, 42]

4.4 Study Area/ Setting

Region I Medical Center, Dagupan City, Pangasinan a tertiary government hospital catering to confirmed and suspected COVID-19 patients.

4.5 Inclusion Criteria

The following were included in the survey: (1) adults exposed to suspected and confirmed COVID-19 patients; (2) good mental health status

4.6 Exclusion Criteria

(1) HCWs with previous medical history of depression, anxiety, post traumatic disorder and/or under psychotropic medications; (2) HCWs who are stratified as high-risk group (senior citizen, pregnant and with co-morbidities such as diabetes, CAD, cancer, cerebrovascular Disease and chronic respiratory diseases)

4.7 Ethical Considerations

The study was conducted in accordance with the ethical standards of the institution and with Helsinki declaration and its later amendments. Written informed consent was obtained from all participants included in the study. Vulnerable population were protected accordingly. All the information gathered were strictly held confidential by the investigators of the study. There are no risks

of physical injury nor economic risk associated with participation in this study. Inclusion in this study is purely voluntary with no monetary benefit. The primary investigator did not receive any compensation for this study and shouldered all expenses.

4.8 Statistical Analysis

Data analysis was performed using Statistical Package for the Social Sciences (SPSS) statistical software version 20.0 (IBM Corp). Baseline and demographic descriptive statistics were presented using counts and percentages for categorical variables.

The significance level will be at α = .05, and all tests are 2-tailed. The original scores of the 3 measurement tools were presented as medians interquartile ranges (IQRs). The data collected from the counts of each level for symptoms of depression, generalized anxiety and subjective distress were presented as numbers and percentages. The original scores of the 3 measurement tools were not normally distributed and so are presented as medians with interquartile ranges (IQRs). The nonparametric Mann-Whitney *U* test and Kruskal-Wallis test was applied to compare the severity of each symptom between 2 or more groups.

RESULTS

Demographic Characteristics

In this study, among the 450 HCWs asked to participate, 417 (92.67%) have completed the survey. Characteristics of the participants are presented in Table 1. Most participants were female 273 (64.57%), single (62.59%) and aged 19-30 years old (53.24%). Majority of the respondents were nurses (60.43%) and the rest was comprised of physicians (25.9%) and allied health professionals (13.67%). Fifty three percent lives with senior citizens and have household members with comorbidities, 237 (56.83%). Exposure to confirmed and suspected COVID-19 patients is typically 14 days in 44.84% of the participants.

Severity Level

Table 2 shows the summary of the severity of symptoms of anxiety, depression and distress. Two hundred twenty-four (53.72%) participants had generalized anxiety and was more severe among men and allied health professionals. Off all respondents, 149 (35.73%) had mild symptoms, 47 (11.27%) reported moderate and only 6.71% had severe symptoms. Two hundred sixty-nine or 67.5% answered the last question that it was difficult for them to do their work, take care of things at home and get along with other people this particularly affected more women (174, 43.71%) than men (95, 23.87%).

Depression was present in 44.12% (184) with physicians and women exhibiting the more severe symptoms. Symptoms were mild in 127 (30.46%) participants, moderate in 46 (11.03%) and severe in 4 (0.96%).

Subjective distress was experienced by 253 (60.67%) healthcare workers. Similar to generalized anxiety, symptoms were more severe with men and allied health professionals. Severity was mild in 182 (43.65%), moderate in 59 (14.15%) and severe in 12 (2.88%).

Scores of Measurement

Table 3 summarizes the scores for generalized anxiety, depression and distress. The median (IQR) score for GAD-7 was 5, 4 for PHQ-9 and 12 for IES-R. In all 3 scales, there was a significant difference in comparison in terms of occupation with p value 0.011 for anxiety, <0.001 for depression and 0.045 for distress. Pairwise comparison shows that physicians have higher scores than nurses with p value of 0.003 for anxiety and <0.001 for depression. Allied health professionals scored significantly higher than nurses for depression (p value 0. 012) and distress (p value 0.024). No significant difference was observed between physicians and allied health professionals.

TABLE 1. Demographics

Characteristic	Total	Physician	Nurse	Allied Health Professional			
				Total	Medical Technologist	Radiologic Technologist	Respiratory Therapist
Overall	N = 417	108 (25.9%)	252 (60.43%)	57 (13.67%)	27 (6.47%)	23 (5.52%)	7 (1.68%)
Gender, n (%)							
• Men	144 (34.53)	39 (36.11)	91 (36.11)	14 (24.56)	4 (14.81)	7 (30.43)	3 (42.86)
• Women	273 (65.47)	69 (63.89)	161 (63.89)	43 (75.44)	23 (85.19)	16 (69.57)	4 (57.14)
Age, n (%)							
• 19-30	222 (53.24)	47 (43.52)	133 (52.78)	42 (73.68)	21 (77.78)	15 (65.22)	6 (85.71)
• 31-40	147 (35.25)	50 (46.3)	88 (34.92)	9 (15.79)	5 (18.52)	4 (17.39)	0
• 41-50	37 (8.87)	9 (8.33)	22 (8.73)	6 (10.53)	1 (3.7)	4 (17.39)	1 (14.29)
• 51-59	11 (2.64)	2 (1.85)	9 (3.57)	0	0	0	0
Marital Status, n (%)							
• Single	261 (62.59)	73 (67.59)	145 (57.54)	43 (75.44)	23 (85.19)	15 (65.22)	5 (71.43)
• Married	152 (36.45)	34 (31.48)	104 (41.27)	14 (24.56)	4 (14.81)	8 (34.78)	2 (28.57)
• Separated	1 (0.24)	0	1 (0.4)	0	0	0	0
• Widowed	3 (0.72)	1 (0.93)	2 (0.79)	0	0	0	0
Educational Attainment, n (%)							
• Elementary	0	0	0	0	0	0	0
• High School	0	0	0	0	0	0	0
• College Graduate	278 (66.67)	0	226 (89.68)	51 (89.47)	22 (81.48)	22 (95.65)	7 (100)
• Post Graduate	139 (33.33)	108 (100)	25 (9.92)	6 (10.53)	5 (18.52)	1 (4.35)	0
Number of Children, n (%)							
• None	252 (60.43)	73 (67.59)	138 (54.76)	41 (71.93)	19 (70.37)	18 (78.26)	4 (57.14)
• 1-2	135 (32.37)	33 (30.56)	89 (35.32)	13 (22.81)	7 (25.93)	4 (17.39)	2 (28.57)
• ≥3	30 (7.19)	2 (1.85)	25 (9.92)	3 (5.26)	1 (3.7)	1 (4.35)	1 (14.29)
Number of Senior Citizen in the household, n (%)							
• None	192 (46.04)	45 (41.67)	119 (47.22)	28 (49.12)	15 (55.56)	10 (43.48)	3 (42.86)
• 1-2	206 (49.4)	57 (52.78)	123 (48.81)	26 (45.61)	12 (44.44)	11 (47.83)	3 (42.86)
• ≥3	19 (4.56)	6 (5.56)	10 (3.97)	3 (5.26)	0	2 (8.7)	1 (14.29)
Number of Household Members with Comorbidities, n (%)							
• None	180 (43.17)	32 (29.63)	115 (45.63)	33 (57.89)	14 (51.85)	16 (69.57)	3 (42.86)
• 1-2	197 (47.24)	65 (60.19)	114 (45.24)	18 (31.58)	11 (40.74)	5 (21.74)	2 (28.57)
• ≥3	40 (9.59)	11 (10.19)	23 (9.13)	6 (10.53)	2 (7.41)	2 (8.7)	2 (28.57)
Number of Pregnant in the Household, n (%)							
• None	391 (93.76)	102 (94.44)	234 (92.86)	55 (96.49)	27 (100)	21 (91.3)	7 (100)
• ≥1	26 (6.24)	6 (5.56)	18 (7.14)	2 (3.51)	0	2 (8.7)	0
Number of Years in Hospital Service, n (%)							
• < 1 year	39 (9.35)	17 (15.74)	11 (4.37)	11 (19.3)	4 (14.81)	3 (13.04)	4 (57.14)
• 1-3 years	111 (26.62)	62 (57.41)	34 (13.49)	15 (26.32)	7 (25.93)	6 (26.09)	2 (28.57)
• 4-6 years	129 (30.94)	12 (11.11)	99 (39.29)	18 (31.58)	9 (33.33)	9 (39.13)	0
• 7-9 years	70 (16.79)	7 (6.48)	60 (23.81)	3 (5.26)	2 (7.41)	1 (4.35)	0
• ≥10 years	68 (16.31)	10 (9.26)	48 (19.05)	10 (17.54)	5 (18.52)	4 (17.39)	1 (14.29)

Length of Time in Handling Confirmed and Suspected COVID-19 Patients, n (%)							
• 1-7 days	153 (36.69)	17 (15.74)	132 (52.38)	4 (7.02)	2 (7.41)	1 (4.35)	1 (14.29)
• 8-14 days	77 (18.47)	16 (14.81)	59 (23.41)	2 (3.51)	2 (7.41)	0	0
• >14 days	187 (44.84)	75 (69.44)	61 (24.21)	51 (89.47)	23 (85.19)	22 (95.65)	6 (85.71)

Table 2. Severity Categories of Anxiety, Depression and Distress Measurements

Severity Category	Overall	Physician	Nurse	Allied Health Professional				Men	Women
				Total	Medical Technologist	Radiologic Technologist	Respiratory Therapist		
	N = 417	n = 108	n = 252	n = 57	n = 27	n = 23	n = 7	n = 144	n = 273
GAD-7, Generalized Anxiety									
• Normal	193 (46.28)	40 (37.04)	126 (50)	27 (47.37)	12 (44.44)	8 (34.78)	7 (100)	76 (52.78)	117 (42.86)
• Mild	149 (35.73)	41 (37.96)	87 (34.52)	21 (36.84)	10 (37.04)	11 (47.83)	0	46 (31.94)	103 (37.73)
• Moderate	47 (11.27)	18 (16.67)	25 (9.92)	4 (7.02)	1 (3.7)	3 (13.04)	0	11 (7.64)	36 (13.19)
• Severe	28 (6.71)	9 (8.33)	14 (5.56)	5 (8.77)	4 (14.81)	1 (4.35)	0	11 (7.64)	17 (6.23)
PHQ-9, Depression Symptoms									
• Normal	233 (55.88)	37 (34.26)	163 (64.68)	33 (57.89)	13 (48.15)	13 (56.52)	7 (100)	87 (60.42)	146 (53.48)
• Mild	127 (30.46)	49 (45.37)	62 (24.6)	16 (28.07)	10 (37.04)	6 (26.09)	0	44 (30.56)	83 (30.4)
• Moderate	46 (11.03)	16 (14.81)	24 (9.52)	6 (10.53)	3 (11.11)	3 (13.04)	0	9 (6.25)	37 (13.55)
• Moderately Severe	7 (1.68)	4 (3.7)	1 (0.4)	2 (3.51)	1 (3.7)	1 (4.35)	0	3 (2.08)	4 (1.47)
• Severe	4 (0.96)	2 (1.85)	2 (0.79)	0	0	0	0	1 (0.69)	3 (1.1)
IES-R, Distress Symptoms									
• Normal	164 (39.33)	45 (41.67)	101 (40.08)	18 (31.58)	8 (29.63)	9 (39.13)	1 (14.29)	66 (45.83)	98 (35.9)
• Mild	182 (43.65)	41 (37.96)	114 (45.24)	27 (47.37)	9 (33.33)	12 (52.17)	6 (85.71)	57 (39.58)	125 (45.79)
• Moderate	59 (14.15)	17 (15.74)	33 (13.1)	9 (15.79)	8 (29.63)	1 (4.35)	0	15 (10.42)	44 (16.12)
• Severe	12 (2.88)	5 (4.63)	4 (1.59)	3 (5.26)	2 (7.41)	1 (4.35)	0	6 (4.17)	6 (2.2)

Abbreviations: GAD-7, 7-item Generalized Anxiety Disorder; PHQ-9, 9- item Patient Health Questionnaire; IES-R, 22-item Impact of Event Scale–Revised

Table 3. Scores of Anxiety, Depression and Distress Measurement

	Occupation							P-value	Gender		P-value
	Median (IQR)								Median (IQR)		
	Overall	Physician	Nurse	Allied Health Professional					Men	Women	
	Median (IQR)			Total	Med Tech	Rad Tech	Respiratory Therapist				
GAD-7, Anxiety	5 (2-8)	6.5 (3-10)	4.5 (2-8)	5 (2-7)	5 (2-8)	6 (3-8)	2 (1-4)	.011*	4 (2-8)	5 (2-8)	0.138
PHQ-9, Depression	4 (1-8)	6 (3-9)	3 (1-6)	4 (3-8)	5 (2-9)	4 (3-9)	3 (2-3)	<.001*	3 (1-7)	4 (1.5-8)	0.123
IES-R, Distress	12 (4-23)	14.5 (4-24)	11 (4-22)	17 (6-24)	23 (6-39)	13 (6-20)	14 (9-24)	.045*	11 (3-22.75)	13 (5-23)	0.16

*significant p < .05

DISCUSSION

The mental well-being of HCWs involved in handling and treating patients with COVID-19 was significantly affected by this pandemic. The occurrence of symptoms of generalized anxiety, depression and distress with the majority of the participants surpassed the 35% prevalence of psychological comorbidities that was seen during the SARS period.[32] Our findings is similar to a recent study by Lai et.al in China wherein the proportions of healthcare workers who experienced anxiety, depression and distress (71%) were 44.6%, 50% and 71% respectively.[25] In contrast to studies done in China, anxiety was more common among the male gender in this study. Depression was more consistent as more women were affected similar to other studies done in Asia.[25, 47,48]

In the Philippines, a study by Tee et al[43] reported low proportions of healthcare providers presenting with symptoms of anxiety, depression and distress however only 32% of their respondents are healthcare professionals which might explain the discrepancy with our results.

Distress seems to be more evident in our results and the variables that can account for it are the following: shortage of supplies of PPE and the increasing influx of suspected and confirmed cases of COVID-19, unsafe working environment, isolation, transmission of the disease to family members which contribute to the pressures and concerns of HCWs. This could, in turn, lead to lack of motivation, desperation and feelings of guilt.[49]

It is noteworthy that in this study, the nurses had the lowest scores in all 3 scales. It can probably be due to the good support of the nursing service to their staff. Other contributing factors since two or more nurses work per shift, would be their ability to talk to someone about their experiences and discuss the emotional and physical challenges of work which could help reduce the feelings of loneliness and stress.[48]

During outbreaks, the HCWs experience considerable stress just like during the MERs outbreak and similar outcome is being expected in COVID-19. There is a need to highlight the need for appropriate psychological support, interventions and staff support measures. Ensuring and protecting the safety of HCWs is a crucial tool in national emergency public health response in fighting this pandemic.

LIMITATIONS

We recognize several limitations of this study which include, first, its limited scope because data collected came from a single tertiary hospital in our region, done in a short period of time with no longitudinal follow-up. Experiences of HCWs from other hospitals might be different thus should be compared especially with the private institutions. Second, there was oversampling of nurses leading to selection bias. As a result, the conclusion might be less generalizable to the entire population. Another limitation is that self-reported levels of psychological impact, anxiety, depression and stress may not always be aligned with assessment by mental health professionals. Third, most of the cases handled were asymptomatic patients or had mild symptoms which can significantly affect the results as compared to other centers wherein severe cases are being handled by healthcare workers. Further studies which can include assessment of post- traumatic stress disorder (PTSD) among health care workers and social support in accordance with existing public health measures is of valuable information and can undoubtedly contribute to literature.

CONCLUSION

The results of this study established that a significant portion of healthcare workers are suffering from generalized anxiety, depression and distress. Clearly, there is a need to better recognize mental health needs of our health care workers to avert the occurrence of significant mental health problems. They would benefit from personalized care from mental health professionals such as psychiatrists, psychologists and psychotherapists focusing on telehealth measures or providing online or smartphone- based psychoeducation. This may promote mental wellness and may initiate psychotherapeutic treatments and psychosocial interventions like cognitive behavioral therapy, mindfulness-based therapy and mental health and psychosocial support (MHPSS). Moreover, positive working environment with the re-assurance of

personal safety and their family safety can further preserve our health care workers' mental well-being. Public health measures should also include care of the mental health of our front liners.

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APPENDIX

Supplementary Table 1. Level of Difficulty

	Not difficult at all		Somewhat difficult		Very difficult		Extremely difficult		Total	
	GAD-7 (n = 129)	PHQ-9 (n = 157)	GAD-7 (n = 230)	PHQ-9 (n = 190)	GAD-7 (n = 36)	PHQ-9 (n = 17)	GAD-7 (n = 3)	PHQ-9	GAD-7 (n = 398)	PHQ-9 (n = 364)
Gender										
• Men	41 (31.78)	52 (33.12)	81 (35.22)	70 (36.84)	13 (36.11)	5 (29.41)	1 (33.33)	0	136 (34.17)	127 (34.89)
• Women	88 (68.22)	105 (66.88)	149 (64.78)	120 (63.16)	23 (63.89)	12 (70.59)	2 (66.67)	0	262 (65.83)	237 (65.11)
Occupation										
• Physician	22 (17.05)	27 (17.2)	71 (30.87)	69 (36.32)	11 (30.56)	6 (35.29)	0	0	104 (26.13)	102 (28.02)
• Nurse	83 (63.34)	104 (66.24)	136 (59.13)	97 (51.05)	17 (47.22)	6 (35.29)	2 (66.67)	0	238 (59.8)	207 (56.87)
• Allied Health Professional	24 (18.6)	26 (16.56)	23 (10)	24 (12.63)	8 (22.22)	5 (29.41)	1 (33.33)	0	56 (14.07)	55 (15.11)
Medical Technologist	12 (50)	12 (46.15)	10 (43.48)	12 (50)	3 (37.5)	3 (60)	1 (100)	0	26 (46.43)	27 (49.09)
Radiologic Technologist	8 (33.33)	8 (30.77)	10 (43.48)	11 (45.83)	5 (62.5)	2 (40)	0	0	23 (41.07)	21 (38.18)
Respiratory Therapist	4 (16.67)	6 (23.08)	3 (13.04)	1 (4.17)	0	0	0	0	7 (12.5)	7 (12.73)

Supplementary Table 2. Intergroup Comparison of Occupation Differences on Scores of Anxiety, Depression, and Distress

		Occupation			p value	
Scale	Physician	Nurse	Allied Health Professionals	p^a	p^b	p^c
GAD-7, median (IQR)	6.5 (3-10)	4.5 (2-8)	5 (2-7)	.003*	0.066	0.687
PHQ-9, median (IQR)	6 (3-9)	3 (1-6)	4 (3-8)	<.001*	0.076	.012*
IES-R, median (IQR)	14.5 (4-24)	11 (4-22)	17 (6-24)	0.118	0.377	.024*

*significant at p < .05
p^a Physician vs Nurse
p^b Physician vs Allied Health Professionals
p^c Nurse vs Allied Health Professionals