Research Article

Assessment of Depression, Anxiety, and Stress among Health Care Professionals due to Covid - 19

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Abstract: Background: The emergence of an undisclosed pneumonia outbreak in Wuhan, China, in December 2019 led to the global spread of Corona virus Disease (COVID-19), declared a pandemic by the WHO on March 12, 2020. Healthcare workers (HCPs) faced unprecedented challenges, with studies revealing elevated stress, depression, and anxiety. Despite differing roles, direct health care providers reported higher psychological distress. The absence of a definitive treatment compounded fears, resulting in anxiety, depression, and stress among patients, Healthcare professionals and normal subject.

Objective: To identify the level of anxiety, depression, and stress among health care professionals due to the wave of Covid- 19.

Materials and Methods: Analytical cross-sectional survey was done among health care workers who were working in a tertiary care hospitals, Sohail Trust Hospital Korangi Industrial Area, Karachi, and Medicare Cardiac and Dental Hospital Tariq Road, Karachi from January 2022 to April 2022 in the third wave of Covid-19. The Depression, Anxiety, and Stress Scale-21 Items (DASS-21) self reporting scale based questionnaire was used to examine mental health. During data analysis, descriptive and inferential statistics were calculated in SPSS.

Result: Out of 416 participants, 56% were females and 56.2% were single. The mean age of the respondents was 29.36 years (± 5.5). The symptoms of anxiety were reported by 47%, depression by 35% and stress was reported by 21% of participants. The level of anxiety, depression, and stress was higher in male technicians, frontline workers, HCP with chronic illnesses, and those who got covid-19 infection. Based on the results, it was identified that male had higher odds of developing anxiety while female, HCPs belonging to age groups of above 25 years and those with work experience lesser than 5 years showed to have greater odds of having stress.

Conclusion: COVID-19 has caused Anxiety, Depression, and Stress among Pakistani healthcare workers. Early intervention with focused strategies and psychological therapies could help to prevent more serious problems.

Keywords: Depression, Anxiety, Stress, Healthcare Professionals, Covid –19, Mental health.

INTRODUCTION

A break out of pneumonia of unrevealed origin was reported in Wuhan city of China in December 2019 and since then virus spread out over the globe. WHO claimed this disease as a pandemic on 12th, March, 2020 because of the global spread of the virus and worldwide mortality caused by Coronavirus Disease [1].

The mental health related symptoms due to Covid-19 were sadness, anxiety, traumatic stress, avoidance, and exhaustion, on the other hand [2].

Studies conducted in China have discovered that during the peak of the COVID-19 outbreak among 1563 HCPs, 73% had stress-related symptoms, 57% experienced depressive symptoms, 45% reported anxiety, and 36% reported insomnia [3].

In 2020 a research study was conducted during Covid –19 pandemics it was found that among 2045 participants 65.6% were suffering from moderate to severe anxiety signs and symptoms and 42.3% had moderate to severe depression symptoms [4].

According to Johnson *et al*., the health care workers providing direct care to the coronavirus disease (Covid-19) patients reported higher depression and post-traumatic stress disorder (PTSD) symptoms contrary to indirect health care providers [5].

Xiang *et al.*, reported in an article that the health care professionals providing care to the Covid-19 suspected or confirmed patients were more susceptible to get the psychological stress than the whole population [6].

Kisely *et al*., explored that almost the dominant psychological impact was related to increased workload, the insecurity for personal protection, and anxiety about getting infection to themselves and their families. The impact on the mental health of the nurses is high as compared to the doctors [7].

Being exposed to the virus, providing care to the patients not

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following the safety measures when dealing with critically ill or terminal patients, agitation for wearing personal protective equipment (PPEs) for long duty hours were a most common stimulus for anxiety and depression among healthcare professionals [8].

There are numerous findings in the literature indicating that front-line clinicians who were exposed to and involved in the diagnosis and treatment of coronavirus disease (COVID-19) patients were more vulnerable than those who are not [9].

One of the obstacles for healthcare workers dealing with patients who are afraid of the sickness is the lack of a viable treatment. Anxiety, sleeplessness, depression, and stress are common side effects of this apprehension [10].

This topic has been selected during the Covid-19 outbreak in Pakistan, the psychological health issues in health care professionals are increasing day by day in Pakistan [11]. Therefore, by observing this, it was preferred to collect data from different healthcare professionals in Pakistan, to explore how much healthcare professionals' mental health was affected during covid-19 in terms of long working hours and high workload.

The purpose of this study was to see the continuing and after-effects of the pandemic on the mental health of health care workers as the pandemic has been continuing for almost two 2 years and to identify the level of anxiety, depression, and stress among health care professionals due to the wave of corona virus disease (Covid- 19) pandemic in Pakistan.

MATERIALS AND METHODS

Analytical cross-sectional survey was done among health care workers who were working in a tertiary care hospitals, Sohail Trust Hospital Korangi Industrial Area, Karachi, and Medicare Cardiac and Dental Hospital Tariq Road, Karachi from January 2022 to April 2022. Both of the hospitals were private tertiary care hospitals that included all medicals and surgical wards including 24 hours' intensive care units and emergency setup. The study populations were health care professionals. The doctors, dentists, nurses, technicians, and physiotherapists with a degree or diploma in health education were included. All non-healthcare staff like security guards, unit receptionists, office workers, sweepers, maintenance departments, and billing departments was excluded from the research study. People with pre-existing psychiatric illnesses, those with recent calamities at home were also excluded. The data was collected through purposive sampling technique. The sample size was calculated by Open EPI Calculator Version 3.01. The prevalence of Anxiety was 20.2%, Depression 12.7%, and Stress was 59% respectively (Aly *et al*. 2021). Keeping the greatest prevalence in these variables was stress 59%, used with a confidence level of 95% and a margin error of 5%, the sample size was calculated to be 372. Therefore, the greatest sample size was used for this study. The sample size was inflated upto 10% to cater non-responses and the final sample size was 416. Data was collected by a well-structured

questionnaire with valid 21 items Likert based scale (DASS 21) to calculate anxiety, depression, and stress levels (Antony *et al*., 1998). On this scale from 1st, 7th questions were about anxiety, the next 7th were related to depression and the last 7th were about stress which is made available to refer in appendices.

This scale consists of four rating scales:

- Never or "0" rate indicated not related to me.
- Sometimes or "1" means a little bit of relation.
- Often or "2" denotes some good degree relation.
- Always or "3" applied most of the time.

The Cronbach's alpha was 0.81 of (DASS 21) (Antony *et al*., 1998) (Table **1**).

Table 1. DASS-21 Cut-off Scores for Anxiety, Depression and Stress.

	DASS-21 Scoring	**Anxiety**	**Depression**	**Stress**
1.	Normal	0-3	0-4	0-7
2.	Mild	4-5	5-6	8-9
3.	Moderate	6-7	7-10	10-12
4.	Severe	8-9	11-13	13-16
5.	Extremely Severe	10+	14+	17+

The study variables were Anxiety, Depression and Stress. The primary exposure variable was health care profession during Covid -19 pandemic. Information was also collected for socio -demographic variables such as age, education, marital status and occupation. The employment related factors were Types of job, working hours, and the duration of Employment. The information was verified by the employment record. Questions regarding chronic illness and disability were asked from study participants and verified through previous labs and routine check-ups. Details like fear of getting Covid -19, worries regarding family getting affected by Covid –19 were also asked. Covid -19 infection was confirmed by PCR test.

Written consent was taken from the participants and their information was kept confidential. The research was conducted after obtaining approval from the institutional Ethical Review.

STATISTICAL ANALYSIS

The data was analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics was computed for all variables. Frequency, mean and standard deviation were calculated for continuous variable while categorical variables were assessed by computing frequencies. The association between independent variables with anxiety, depression and, stress analyzed using Chi-square, and Regression analysis.

Logistic regression was applied to assess the association of independent variables with the dependent variables. Crude odds ratio along with 95% confidence interval (CI) for each variable of

interest were calculated. P-values were calculated by Likelihood Ratio Test for the significance of the beta coefficients.

RESULT

This research study was conducted on 416 participants out of 416 participants 56% were females and 56.2% were single. The mean age of the respondents was 29.36 years with the Standard Deviation of 5.5. The sample composed of educated people among them half of the respondents had completed education up to graduate level (55%) Nursing was the most dominant profession among the whole being 43.3%. In the context of ethnicity, most respondents were Urdu speakers (34.9%). In context of employment related history of respondents, the majority of people (84.6%) were front line workers directly dealing with the Covid-19 patients. The mean duration and mean working hours of the employment was found to be 5.76 years and 8.35 hours per day with Standard Deviation of 4.7 and 2.1 respectively.

The Covid-19 related history revealed that almost half of the respondents were suffering from fear of getting a Covid-19 infection (Table **2**).

Table 2. Socio Demographic Characteristics and Employment - Related History of Respondents.

Variables	Frequency (n = 416)	Percentage (%)
Age(in years)* 29.36 (5.5)		
19-28 (years old)	219	52.6 %
29-38 (years old)	176	42.4 %
39-48 (years old)	15	3.5 %
49-60 (years old)	06	1.3 %
Gender		
Male	183	44.0
Female	233	56.0
Level of Education		
Matric	26	6.3
Intermediate	47	11.3
Graduate	229	55.0
Post-graduate	114	27.4
Marital Status		
Single	234	56.25
Married	182	43.75
Mother Tongue		
Urdu	145	34.9
Sindhi	44	10.6
Punjabi	107	25.7
Pashto	83	20.0
Balochi	9	2.2
Others	28	6.7

Variables	Frequency	Percentage
Occupation		
Nursing Staff	180	43.3
Doctor	135	32.5
Lab/OT Technician	85	20.4
Others	16	3.8
Duration of Employment (in years) * 5.76 (4.7)		
01-10 years	359	
11-20 years	52	
21-30 years	05	
Working Hours per Day* 8.35 (2.1)		
03-10 hours	361	
11-18 hours	55	
Long Term Illnesses		
Yes	62	14.9
No	354	84.1
Total	416	100%
Types of Job		
Frontline Worker	352	84.6
2nd Line Worker	64	15.4
Fear of getting Covid -19		
Yes	200	48.1
No	216	51.9
Worry about that Family could be Affected by You during Covid –19		
Yes	295	70.9
No	121	29.1
Getting Covid -19 Infection		
Yes	138	33.2
No	278	66.8

*Mean Standard Deviation.

The analysis of DASS-21 demonstrated that out of 416 respondents anxiety symptoms were reported by most of the respondents (47%), depression score was 35% and stress was reported by 21%. Almost 18.5 % of the participants reported mild anxiety, 12.5 % moderate anxiety, 8.2% with severe anxiety and only 8% of them reported extremely severe anxiety. For depression sub scale 9.1% were considered mild depression, 18.8% moderate, 3.8 % severe depression and 3.1% were reported to be extremely severe depression. For stress subscale, 7% of participants reported symptoms of mild stress 9% investigated moderate stress, 4.6 % severe whereas only 1% of the respondents faced extremely severe level of stress (Table **3**).

Table 3. Level of Anxiety, Depression and Stress.

DAS Variables	Grading	Frequency (n=416)	Percentage (%)	DAS Positive (%)
Anxiety	Normal	220	52.9	Anxiety Positive 47%
	Mild	77	18.5	
	Moderate	52	12.5	
	Severe	34	8.2	
	Extremely Severe	33	8.0	
Depression	Normal	271	65.1	Depression Positive 35%
	Mild	38	9.1	
	Moderate	78	18.8	
	Severe	16	3.8	
	Extremely Severe	13	3.1	
Stress	Normal	327	78.6	Stress Positive 21%
	Mild	29	7.0	
	Moderate	37	9.0	
	Severe	19	4.6	
	Extremely Severe	4	1.0	

Relationship of Sociodemographic Characteristics with Anxiety, Depression and Stress

In health care professionals the level of Anxiety, Depression and Stress was higher in matriculated and graduate students than other levels of education due to the wave of Covid 19 (p =0.016), while in the male the level of Anxiety, Depression and Stress was slightly higher than in females (p =0.068). The frontline workers were found in a higher level of Anxiety, Depression and Stress than 2nd line workers (p =0.537). Health care workers who were suffering from long-term illnesses like diabetes had a higher level of Anxiety, Depression and Stress than non-diabetics, cancer, hepatitis, gastritis, had a low level of anxiety (p=0.145). The level of Anxiety, Depression and Stress was higher in those who got covid-19 infection than in those who were not infected by Covid 19 infection (p =0.101).

Regression Analyses

Based on the results, we identified that Gender Male Crude (OR: 1.468; 95% CI 0.994-2.166), adjusted (OR: 1.613; 95% CI 1.068--2.435) had higher odds of having anxiety. Moreover, we analyze that age Crude (OR: .381; 95% Cl .224--.649), adjusted (OR: .367; 95% CI .194--.694) those with age. Further, those who were at high risk of getting infection (OR: 1.415; 95%), Adjusted (OR: 1.609; 95% CI 1.044-2.479) had higher odds of developing anxiety. Other all variable chronic illness (p – 0.083), occupation (p- 0.376), level of education (p -0.980), marital status (p- 0.058), were found to be insignificant respectively as shown in the Table **4**.

Table 4. Regression Analyses of Anxiety, Depression and Stress.

S#	Variables	Univariate Analysis				Multivariable Analysis			
		Crude OR	% CI		P-value	Adjusted OR	95% CI		P-value
			Lower	Upper			Lower	Upper	
Predictors of Anxiety									
1	Male	1.468	0.994	2.166	0.053	1.613	1.068	2.435	0.023
2	Chronic Illness (positive)	1.588	0.821	3.068	0.169	1.837	0.924	3.653	0.083
3	Getting Covid-19 infection	1.415	0.940	2.132	0.096	1.609	1.044	2.479	0.031
Predictors of Depression									
1	Female	0.592	0.394	0.890	0.12	0.621	0.390	0.989	0.45
2	Occupation	1.701	1.001	2.88	0.049	1.341	0.700	2.570	0.376
3	Level of education	0.579	0.213	1.570	0.282	1.011	0.422	2.421	0.980
Predictors of Stress									
1	Female	1.322	0.827	2.116	0.244	0.621	0.390	0.989	0.045
2	Age (>25 years)	0.381	0.224	0.649	0.000	0.367	0.194	0.694	0.002
3	Marital status (unmarried)	1.401	0.875	2.241	0.160	1.750	0.980	3.124	0.058
4	Duration of employment (<5 years)	1.454	0.890	2.376	0.135	1.989	1.035	3.824	0.039

CI: Confidence Interval.

DISCUSSION

Our study reported the degree of Anxiety, Depression, and Stress level among healthcare professionals because of the wave of Covid -19 in Pakistan.

The results of our study showed that anxiety were exhibiting by the majority of the respondents (47%), depression score was 35% and stress was found to be 21%. The same outcomes were demonstrated by a Chinese report in which the most well-known emotional wellness issue was likewise moderate to extreme anxiety (28.8%), trailed by depression (16.5%) and stress 10% [12]. Further, a Spanish report uncovered that the most pervasive issue was depression (29.6%), as opposed to anxiety (25.3%), or stress (22.4%) [13]. This examination showed the degree of Anxiety, Depression, and Stress level surveyed among healthcare professionals because of the wave of Corona virus in Pakistan's different nations.

Our review showed that males have a more elevated level of Anxiety, Depression and Stress, while in a reference study, it was discovered that females have fundamentally more elevated levels of Anxiety, Depression, and Stress than males [13]. Furthermore, our study in Latin America have exhibited that men have essentially lower levels of gloom, stress, and tension than women [14].

Unmarried respondents have somewhat high Anxiety, Depression, and Stress level than the married equal outcome was displayed in a Pakistani report [15]. Equally, married individuals would in general have essentially lower levels of Anxiety, Depression, and Stress than single individuals, as revealed in different analyses [16].

Among healthcare professionals, the degree of Anxiety, Depression, and Stress was practically similar in Doctors, Nurses [17]. On the contrary, a study carried out in Iran showed that the Doctors, Nurses were mostly impacted by mental health issues compared to other Healthcare professionals [18].

In our review, the degree of Anxiety, Depression, and Stress was higher in matriculated and graduates because of the wave of Covid -19 which is a typical finding of different research studies [19]. Additionally, understudies, exposure, and the absence of academic progress are sources of huge stress [20].

In our participants, the degree of mental health issues was higher in the people who got Corona virus infection, likewise expressed that having a variety of side effects sustainable with COVID-19 was related to a critical increase in the chances of developing mental health issues [21].

There are various studies that front-line health workers who were associated with dealing COVID-19 patients had a higher possibility of developing mental health issues than the people who were not [22].

In spite of our study, however, having a positive COVID-19 determination was not related to the degree of mental health issues in healthcare professionals [23]. Mental illness was found significantly higher in health care professionals as elaborated in a study conducted in China by Lai *et al.* [24].

STRENGTH AND LIMITATIONS

In this cross-sectional study, we were not able to establish a causal link; furthermore, we used the validating scale to evaluate the anxiety, depression and Stress symptoms of healthcare Professionals and no any diagnostic criteria is used to assess the mental Health. Recall bias could be present but whenever possible records of age, working hours and duration of Employment were verified by CNIC and employment card. The data were collected from two Hospitals which was most suitable for our study.

CONCLUSION

COVID-19 is a global emergency that has developed anxiety, depression, and stress among healthcare professionals in Pakistan. Approximately half of HCP had Anxiety, one-fourth had depression and one-fifth had stress. The level of anxiety, depression, and stress was higher in matriculated and graduate students, in males, technicians, frontline workers, unmarried people, having long-term illnesses, and those who got a Covid-19 infection. Moreover, other relevant research will be needed to evaluate these early interventions and their long-term benefits.

AUTHORS' CONTRIBUTION

- **Irfan Ali**: Conception and Design.
- **Sameera Ali Rizvi**: Drafting of article.
- **Nida Shoaib and Haya Ul Batool Abbasi**: Analysis and Interpretation of data.
- **Khadija Abid**: Final approval.

CONFLICT OF INTEREST

Declared none.

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