

ORIGINAL RESEARCH

INTENSIVE CARE

Depression, anxiety and stress among healthcare workers in COVID-19 ICUs

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Abstract

Background & Objective: In most of the countries, the intensive care, airway management, and emergency resuscitation teams are largely constituted of the anesthetists, laying a great deal of physical, mental, and emotional pressure on them. In the ongoing COVID-19 outbreak, the anesthetists have been on the fore-front. We compared the level of anxiety, depression, and stress among healthcare workers (HCWs) of COVID-19 ICU (CICUs) and non-COVID ICUs (NCICUs) in the tertiary care hospitals of south Punjab.

Methodology: It was a cross-sectional study was conducted after ethical approval from the institutional review board, and completed from December 10, 2020 to January 20, 2021, through Google forms by generating online structured questionnaires i.e. DASS-21 and GHQ-12. Our target population was HCWs of Anesthesia & Critical care of all the public sector tertiary care hospitals of South Punjab. A total of 100 participants has filled the self-reported questionnaire. After sorting the data, we divided the participants into two groups; CICU and NCICU groups.

Results: Out of 100 participants, 31% were in the COVID ICU group and 69% in the NCICU group. Females were 54% of the total. 55% of the participants were below 30 y of age, 77% were married, and 48% were post-graduates. Overall 50% of HCWs had a probable psychological illness, while 25% had anxiety, 21% depression and 12% had stress. Anxiety, depression, and stress were more in COVID ICU group as compared to the non-COVID group [(35% vs. 20%), (32% vs. 16%) and (31% vs. 3%) respectively].

Conclusion: Coronavirus pandemic has affected the mental health of healthcare workers. Those working in COVID ICUs are more prone to develop psychological distress than non-COVID ICU healthcare workers.

Key words: Depression; Anxiety; Stress; COVID-19; Mental distress; Healthcare workers; ICU

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1. Introduction

Coronavirus has spanned different regions in a distinct wave pattern; 1st wave appeared in the spring, while the second wave commenced in the last autumn of 2020, and it is persistently growing in many countries,¹ infecting 96,673,187 people and caused 2,066,876 deaths worldwide.² In Pakistan, 524,783 people got infected and 11,103 deaths occurred since March 2020³. This

pandemic has held an excessive pressure on the Health care administration and HCWs (healthcare workers), exposing them to psychological issues like anxiety, depression, stress, and social dysfunction. Recently, “Coronaphobia” an epithet has been surfaced, depicting the gravity of situation.⁴ Long-term Anxiety, depression, and stress have negative physical effects on the human body, such as disorders of immune, digestive, cardiovascular, reproductive systems, and sleep.⁵

Table 1: DASS-21 questionnaire with Likert scale and cutoff values

S. No.	Questions	Did not apply to me	Applied to some degree	Applied to considerable degree	Applied to me very much
1(s)	I found it hard to wind down	0	1	2	3
2(a)	I was aware of dryness of my mouth	0	1	2	3
3(d)	I couldn't experience any positive feelings at all	0	1	2	3
4(a)	I experienced breathlessness without physical exertion	0	1	2	3
5(d)	I found it difficult to work up the initiative to do things	0	1	2	3
6(s)	I tended to over-react to situations	0	1	2	3
7(a)	I experienced trembling e.g. of hands	0	1	2	3
8(s)	I felt that I was using a lot of nervous energy	0	1	2	3
9(a)	I was worried that I might panic and make fool of myself	0	1	2	3
10(d)	I felt that I had nothing to look forward to	0	1	2	3
11(s)	I found myself getting agitated	0	1	2	3
12(s)	I found it difficult to relax	0	1	2	3
13(d)	I felt down-hearted and blue (sad)	0	1	2	3
14(s)	I was intolerant of anything that kept me from getting my work done	0	1	2	3
15(a)	I felt I was close to panic	0	1	2	3
16(d)	I was unable to become enthusiastic about anything	0	1	2	3
17(d)	I felt I wasn't worth much as a person	0	1	2	3
18(s)	I felt that I was rather touchy	0	1	2	3
19(a)	I experienced palpitations (sense of loud heart beating)	0	1	2	3
20(a)	I felt scared without any good reason	0	1	2	3
21(d)	I felt that life was meaningless	0	1	2	3

DASS-21 Scoring with cutoff values

Category	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Table 2: GHQ-12 scoring system

POSITIVE					
No	Question	Better than usual	Same as usual	Less than usual	Much Less than usual
1	Able to concentrate	0	0	1	1
2	Feeling reasonably happy	0	0	1	1
3	Playing useful part	0	0	1	1
4	Capable of making decisions	0	0	1	1
5	Enjoy normal activities	0	0	1	1
6	Face up to problems	0	0	1	1
NEGATIVE					
No	Question	Not at all	Less than usual	Same as usual	More than usual
7	Under stress	0	0	1	1
8	Could not overcome difficulties	0	0	1	1
9	Feeling unhappy / depressed	0	0	1	1
10	Losing confidence	0	0	1	1
11	Thinking of self as worthless	0	0	1	1
12	Lost much sleep	0	0	1	1
SCORING and Cutoff values in GHQ-12					
Inference	Score				
Normal	0				
Less than optimal mental health	1-3				
Probable mental ill health	>4				

In the course of the first wave, the health-related surveys reported upon the extent of varying degree of anxiety, depression, and stress among HCWs,^{6,7} and highlighted the associated factors, leading to the mental and psychological morbidities.⁸⁻¹⁰ As the second wave has begun taking a toll on human lives, the situation seems worsened even more, thus necessitating the need for re-evaluation of the mental well-being of the HCWs.

In the previous studies, simple surveys were conducted and the study population was HCWs in general. Mostly the intensive care, airway management, and emergency resuscitation teams are constituted of Anesthetists, laying an enormous physical, mental, and emotional pressure on them.^{11,12} We have the perception that the anesthetists working in COVID-19 ICU are more affected by this pandemic as compared to the HCWs, who are working in non-COVID ICUs (NCICU). Therefore, we conducted this study to identify the most affected segment of healthcare workers, i.e. Anesthesiologists, during this pandemic, as no study so far has been done specifically to determine and compare

the level of mental distress among anesthetists working in CICUs (CICU) with non-CICU HCWs. This study will aid to map out the current mental state of CICU HCWs and in the long run, it will help the health care system to improve its services as well as to work on the general well being of the anesthesiologists and other HCWs in special regard to the CICUs.

We compared levels of anxiety, depression and stress among healthcare workers of CICUs and non-CICUs in the tertiary care hospitals of south Punjab.

2. Methodology

To conduct this cross-sectional study, we took ethical approval from the Institutional review board of Sheikh Zayed Hospital Rahim Yar Khan, IRB no. 175/IRB/SZMC, and completed this study from 10th December 2020- 20th January 2021, through Google forms by generating online structured Questionnaires i.e. DASS-21 and GHQ-12. As most of the ICUs are looked after by the teams of Anesthesia department, so our target population was HCWs of Anesthesia & Critical care of all the public sector tertiary care hospitals of South

Table 3: Comparison of Demographic Data between the two groups

Characteristics		Total N = 100	CICU n = 31	Non- CICU n = 69	p value
Gender	Male	43	12 (39)	31 (45)	0.371
	female	54	17 (55)	37 (53.6)	
	Transgender	03	02 (6)	01 (1.4)	
Age (y)	25-30	55	20 (64.5)	35 (51)	0.336
	30-40	29	06 (19.4)	23 (33)	
	> 40	16	05 (16.1)	11 (16)	
Level of Education	MBBS	36	14 (45)	22 (32)	0.113
	MCPS/DA	17	02 (6.5)	15 (22)	
	FCPS/MS	31	12 (38.7)	19 (27)	
	BS Nursing	16	03 (9.7)	13 (19)	
Marital Status	Married	77	23 (74)	54 (78)	0.487
	Unmarried	21	08 (26)	13 (19)	
	Divorced/ Widow	02	0 (0)	02 (03)	
Hours per week	36	15	03 (10)	12 (17)	0.783
	36-42	35	11 (35)	24 (35)	
	42-48	27	09 (30)	18 (26)	
	> 48	23	08 (25)	15 (22)	
Total work Experience (yrs)	< 2	22	10 (32)	12 (17)	0.452
	2-5	43	11 (35.5)	32 (46)	
	5-10	20	05 (16)	15 (22)	
	10-15	08	02 (6.5)	06 (9)	
	> 15	07	03 (10)	04 (6)	

Punjab. While any medical staff working other than ICUs/OTs, and/or in the private sector was excluded from the study.

Data Collection:

All data was collected by generating a Questionnaire using Google forms with self-reported responses and its link was circulated through social media groups of all the Public Sector ICUs (COVID and non-COVID) of South Punjab i.e. Rahim Yar Khan, DG Khan, Multan, and Bahawalpur. A total of 100 participants has filled the self-reported questionnaire. After sorting the data, we divided the participants into two groups; CICU and NCICU groups. Informed consent was a part of the online form in the 1st section. The Questionnaire consisted of three sections. The 1st section was for demographic data which included gender, age, marital status, level of education, duty hours per week, and the place where they had worked in the last 15 days. While

the 2nd and 3rd sections included DASS-21 and GHQ-12 forms respectively (Table 1 and 2).

The Depression-anxiety-Stress-scale-21 (DASS-21) is a globally used tool to quantitatively measure the distress.¹³ It is a set of three self-report scales, designed to measure the emotional states. Each scale contains seven questions, thus a total of 21 questions. The score was calculated and summed up by the Likert scale (0, 1, 2, 3) (Table 1). The cutoff points are given, according to which the participants are labeled as Normal, Mild, Moderate, Severe, and very severe cases of anxiety, stress, and depression.

The General Health Questionnaire-12 (GHQ-12) is a screening tool to identify the potential 'cases' from the 'non-cases' of psychological stress.¹⁴ It contains 12 questions with a Bimodal scoring scale (0-0-1-1) (Table 2). Its score ranges from 0 to 12. The cutoff point was ≥ 4 , i.e. score ≥ 4 is labeled as a potential 'case', and a score less than 4 means a 'non-case' for psychological distress.¹⁵

Statistical Analysis: All the data was entered in SPSS-20. Categorical data were presented

as frequencies, percentages, and bar charts. The two groups; CICU vs. NCICU, were compared for demographic data and the severity of the outcome variables i.e. depression, anxiety, stress and social dysfunction. Statistical significance of categorical data was calculated by Chi-square. Numeric data was presented as mean and standard deviation and the statistical significance was calculated by using a t-test between the two groups. $P < 0.05$ was considered significant.

3. Results

A total of 100 HCWs from all over South Punjab responded to the online questionnaire during one month, and 84% were Anesthesiologists while 16% were staff nurses working in ICUs. Out of these, 31% were placed in the CICU group and 69% in the NCICU group. The basic demographic features were similar for the two groups. More than half of the participants were females

Table 4: Comparison of the Outcome variables between the two groups

DASS-21 Scale		Total N	CICU (n = 31)	Non-CICU (n = 69)	P value
Anxiety	Normal	65	16(52)	49(71)	0.725
	Mild	10	04(13)	06(9)	
	Moderate	15	06(19)	09(13)	
	Severe	10	05(16)	05(7)	
	Mean ± SD	6.65 ± 4.83	8.16 ± 5.35	5.97 ± 4.45	0.035
Depression	Normal	79	21(68)	58(84)	0.076
	Mild	17	07(22)	10(14.5)	
	Moderate	04	03(10)	01(1.5)	
	Mean ± SD	6.26 ± 3.82	7.93 ± 3.77	5.50 ± 3.62	0.003
Stress	Normal	88	21(68)	67(97)	0.000
	Mild	11	09(29)	02(3)	
	Moderate	01	01(3)	0(0)	
	Mean ± SD	8.1 ± 4.77	10.38 ± 5.50	7.07 ± 4.04	0.001
GHQ-12 Scale					
Normal	16	07(22.5)	08(13)	0.207	
Less than optimal Mental Health	34	07(22.5)	27(39)		
Probable Mental illness	50	17(55)	33(48)		
Mean ± SD	3.91 ± 3.04	4.00 ± 3.34	3.86 ± 2.92	0.844	

(54%) and below 30 y of age (55%). The majority was married (77%), nearly half of them were post-graduates (48%) and performing duties > 42 hours per week.

According to DASS-21 scale, overall 25% HCWs have moderate to severe anxiety, 21% have mild to moderate depression and 12% have mild to moderate levels of stress. While comparing the two groups, it was clear that more HCWs were suffering from moderate to severe anxiety in CICU vs. NCICU group (35% vs. 20%), but this difference was statistically insignificant ($p = 0.725$). Similarly, more HCWs have mild to moderate depression in the CICU group vs. NCICU group (32% vs. 16%) statistically this difference was insignificant ($p = 0.076$). Stress was more pronounced in the HCWs of the CICU group (31% vs. 3%) as compared to the NCICU group and it was statistically significant. None suffered from severe stress or depression in either group. The difference of means and SD of Anxiety, depression, and stress score was statistically significant for both groups, indicating higher scores for CICU HCWs.

According to GHQ-12 scale, overall 50% of the HCWs were having probable psychological distress while 34% HCWs were having less than optimal mental health. Comparing the GHQ-12 score in both groups, it was

evident that statistically, both groups were having similar results ($p = 0.207$). The difference of means and SD of the total GHQ-12 score was statistically insignificant for both the groups ($p = 0.844$).

4. Discussion

In our cross-sectional study, we explored the level of different psychological parameters such as anxiety, depression, and stress in the HCWs (mostly anesthetists) serving in CICUs in the region of South Punjab, compared with the HCWs working in non-CICUs. According to our results, we have come up with two vital observations. Our first observation is that there was an overall risk of probable mental illness in half of the HCWs. This is

clarified by the DASS-21 score, which reflects that our doctors and staff nurses working in CICUs were under stress, anxiety, and depression more than those working in places other than CICUs.

Our second observation was slightly intricate. Later in this pandemic, although HCWs were suffering from psychological distress, however, this was not very serious; majority of HCWs fell under the 'Normal' category. This finding may be attributed to the adaptation of some medical interventions; e.g., off-label use of drugs with antiviral and anti-cytokine release syndrome (CRS) characteristics, the introduction of non-invasive ventilation in COVID-19 related ARDS, a decline in the mortality rate,^{16,17} and availability of the vaccine against the virus. The adaptability of coping strategies¹⁸ may be another reason that HCWs were less affected and had only mild to moderate forms of stress and depression.

Going through the literature, we found some local and international studies done earlier in this pandemic that had delineated severe mental health issues in HCWs. The local studies in Pakistan targeted the medical staff in general, working in different hospitals, and not specifically the CICU HCWs. These studies identified higher levels of anxiety, depression, and stress among the HCWs.

A group of researchers reported a very high number of HCWs from COVID isolation wards suffering from moderate to extremely higher levels of anxiety, depression, and stress during the first wave of Coronavirus (85.7%, 72%, and 90% respectively).¹⁹ Another cross-sectional study described two groups with and without insomnia. Their target population was non-specified, including all the HCWs of their hospital. Out of 365 participants, 13.4%, 9.3%, 19.4% had moderate to severe anxiety, depression, and stress respectively.²⁰ Some other local studies evaluated the level of mental distress among HCWs in general and their results showed extremely higher levels of anxiety and depression during the first wave of this pandemic.^{21, 22, 23}

During international literature search, we found similar survey-based studies from India, Iran, China, Turkey, Egypt, Malaysia, Canada, and UK, which reported a higher number of medical professionals suffering from psychological distress during the first wave of Coronavirus.²⁴⁻²⁹ These surveys-based studies identified some major factors as leading causes of the mental and psychological morbidity among HCWs. Some of these factors were: lack of manpower, long working hours, need of rapid decision making, expeditious triaging, unavailability of evidence-based treatment, uncertain outcome, shortage of ICU beds, unavailability of essential equipment, high rate of mortality, observing the misery of the patients with need to take end of life decisions, shortage/lack of availability of PPEs, fear of cross-infection, lacking the capability to cope and certain ethical issues.⁸⁻¹⁰

Continuous mental distress affects the physical well-being in the form of insomnia, anorexia, hormonal imbalance, hypertension, and irritable bowel syndrome,^{28, 29} which eventually affects the quality of work. For instance loss of motivation, work engagement, concentration, mutual collaboration, and productivity leads to poor decision-making and medical accidents.

At the later stages in the pandemic, regardless of the low prevalence of psychological morbidities, HCWs are still liable to psychological distress and the grimness of the situation cannot be overlooked. Therefore, it is essential to take steps at the local level by the hospital administration and higher authorities to ensure that HCWs are not being subjected to unnecessary stress. They need to ensure a safe working environment, proper training to cope with pandemic-stress, destigmatize work-related stress, open recognition of mental health illness as a genuine problem, devise a stress management policy by consultation with the mental-health experts, and to have a human resources manager to deal with the shortage of skilled manpower with special regards to CICUs. Higher authorities should ensure proper infrastructure, create awareness among

the masses, and ensure strict compliance with safety measures.

5. Conclusion

We conclude that the coronavirus pandemic has affected the mental health of healthcare workers. Those working in COVID ICUs are more prone to develop psychological stress than non-COVID ICU healthcare workers, which if left unaddressed, will intensify to various adverse social, psychological and even physical adverse effects among HCWs. Psychological support is imperative to overcome the problem and to reclaim the healthcare system from disintegration.

6. Limitation

We could not determine and exclude the HCWs who were already suffering from some degree of chronic mental disorders. This was a confounder in the study.

7. Conflict of interest

Nil declared by the authors. No institutional or industry funding was involved in this study.

8. Authors' contribution

SS: Concept, Study design, data collection, statistical analysis, manuscript writing

RM, BB: Data collection

9. References

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