



Psychological Wellbeing of Healthcare Workers in Different Hospitals of Karachi (Pakistan) During COVID-19 Pandemic

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Authors' contributions

This research was carried out in collaboration among all the authors. All authors collectively designed the study and were responsible for the literature review. Authors HSM and FA performed the statistical analysis. Authors SA and HSM compiled the results of the study under the supervision of author FA. Authors SA and AI wrote the first draft of the manuscript, which was edited and finalized by authors HSM and FA. All authors read and approved the final manuscript.

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ABSTRACT

Background: With increasing morbidity and mortality rates throughout the world, COVID-19 has caused a universal psychological impact on the lives of people.

Aims: To examine psychological wellbeing of frontline healthcare professionals and compare mental health among doctors, paramedical staff and allied health workers.

Methods: This cross-sectional study included 225 healthcare professionals from 13 different hospitals in Karachi, Pakistan. The symptoms of depression, anxiety and insomnia were assessed using the 9-item Patient Health Questionnaire (PHQ-9), the 7-item Generalized Anxiety Disorder (GAD-7) and the 7-item Insomnia Severity Index (ISI) respectively.

Results: Major findings of the study were that 44.7% participants had no depression, 38% were reported to have mild anxiety and 3.5% had severe insomnia. Insomnia was correlated with anxiety and depression leading to moderate correlation of 0.516 and 0.694 in both with a highly significant p

value ($p=0.001$ and $p=0.001$). A significant association of depression was seen with healthcare providers and years of experience with ($p=0.009$) and ($p=0.010$) respectively. Levels of anxiety were associated with occupation and years of experience that led to the finding that doctors suffered more from mild anxiety (83.5%) whereas years of experience had no significant association. Correlation of insomnia with occupation and years of experience led to the finding that sub threshold insomnia was found in 29% participants, where majority of participants were allied health workers. However, borderline significant association was found between insomnia and the number of years of work experience ($p=0.049$).

Conclusion: It is concluded that frontline workers experienced different levels and symptoms of psychological distress in this pandemic.

Keywords: COVID-19; pandemic; psychological wellbeing; anxiety; depression; insomnia; healthcare workers; mental health.

1. INTRODUCTION

The emergence of novel Coronavirus (COVID-19), the latest public health calamity from Wuhan, China has been a catastrophe for the world since December 2019 [1]. In March 2020, a patient with previous travel history was the first COVID-19 positive patient reported in Pakistan. Since then, despite all preventive measures, the numbers have been increasing, with 185,033 positive cases, 3,695 deaths and 73,471 recoveries as of 23rd June 2020, resulting in hospitals being throng with patients [2], leading to a strong impact on healthcare workers' mental wellbeing and their undergoing exhaustion [3].

The respiratory illness outbreak, caused by COVID-19, has being declared as a global pandemic by the WHO [4,5]. Along with the physical stress, health professionals, dealing with this global, contagious public health occurrence, are under tremendous amount of psychological distress [6]. Even before the pandemic outbreak general practitioners' mental well-being was very pivotal [7]. Studies conducted previously in UK found certain factors that were associated with clinician's anxiety and depression scores that were on the verge of exceeding psychological prosperity [7]. Important factors that were linked to anxiety included job demand, work load, interferences from home and expectations' by patients [7]. Doctors who had less free time throughout the day were prone to have higher depression scores compared to doctors who had half day free [7]. Anxiety and depression scores were higher in doctors who had more frequent on call duties [7].

Studies done during 2003 SARS outbreak revealed that, rise in confirmed and presumed cases, scarcity of personal protective equipment,

insufficient medicines, excessive amount of work, ubiquitous media reporting, fear of spreading disease to family members, worry about personal safety, and not being adequately supported, caused stress, anxiety and depression symptoms and were the main factors that elevated mental stress among health personnel [8,9,10]. Despite it all, healthcare providers are continuing to do their best, both for patients and themselves [11]. To cope up with this imbalance, in Feb 2020, China developed a psychological intervention plan, initiating programs for counseling medical staff on effective ways of dealing with common psychological problems and introducing stress relieving activities. Unfortunately, these programs could not be implemented effectively [9].

The aim of this research was to evaluate the mental health of healthcare workers in the midst of the COVID-19 pandemic by looking at symptoms of anxiety, depression, and insomnia. This research could be used to respond to future unexpected outbreaks in a better equipped manner.

2. MATERIALS AND METHODS

This study was a cross-sectional study conducted. Data was collected in March and April 2020. After informing participants of their confidentiality and anonymity, in total, data was collected from 255 healthcare workers from 13 different hospitals of Karachi, Pakistan who consented to be a part of this study. The original sample size was $n=344$ based on a previous study which assessed insomnia among Covid-19 pandemic in China with a prevalence of 34% [8].

A two-step questionnaire was formulated and disseminated using emails and various social media platforms and the responses were recorded over a period of three days. The

questionnaire comprised of questions pertaining to demographics (step one) and questions particularly relating to psychological well being of health care workers (step two). The questionnaire was pilot tested with 15 individuals to ensure the understandability of the questionnaire in the local setting.

During this study, elevated symptoms of depression, anxiety and insomnia among healthcare providers of Pakistan were assessed using the 9-item Patient Health Questionnaire (PHQ-9) [12], the 7-item Generalized Anxiety Disorder (GAD-7) [13] and the 7-item Insomnia Severity Index (ISI) respectively [14] which were used previously in Wuhan, China [8]. The total scores of these measurement tools were interpreted as follows: PHQ-9, normal (0-4), mild (5-9), moderate (10-14), and severe (15-21) depression; GAD-7, normal (0-4), mild (5-9), moderate (10-14), and severe (15-21) anxiety; and ISI, normal (0-7), sub-threshold (8-14), moderate (15-21), and severe (22-28) insomnia. These categories were based on values established in the literature [11-17]. The cutoff score for detecting symptoms of major depression, anxiety and insomnia were 10, 7 and 15 respectively. Participants who had scored greater than the cutoff threshold were characterized as having severe symptoms.

The data analysis was performed using SPSS statistical software version 20.0. The significance level was set at $\alpha = 0.05$. Descriptive analysis for the numeric outcome variables was represented through mean and standard deviation whereas categorical data was expressed through frequencies and percentages. Pearson correlation was applied to find correlation between depression, anxiety and insomnia whereas ANOVA and pooled t test was applied to find difference in mean among different categories. In addition, chi square test was applied to find any association between categorical variables.

3. RESULTS

In the study, a total of 255 health care professionals participated. Out of the total there were n=145 (56.9%) females and the remaining were males n=110 (43.1%). Among the health care professionals, the majority n=224 (87.8%) were doctors, n=16 (6.3%) were nurses/paramedics and n=15 (5.9%) were allied healthcare professionals. Out of total participants, majority n=156 (61.2%) had an

overall experience of upto 5 years, followed by n=53 (20.86%) with an experience of more than 10 years. Healthcare professionals were divided into different age groups, majority, n=102 (40%) participants, were 25-30 years old followed by n=50 (19.6%) participants having age of 30-35 years. Furthermore, when the working sector was inquired n=151 (59.2%) were working for the private sector and the remaining n=104 (40.8%) belonged to public sector.

The mean score of participants' depression was 6.2 +/- 5.2 with majority n=114 (44.7%) having no depression, n=84 (32.9%) having mild depression and only n=19 (7.5%) healthcare professionals suffered from severe depression. Similarly, anxiety analysis revealed that the mean score of anxiety was 6.9 +/- 4.9 and that mild anxiety was the most common among the healthcare workforce, n=97 (38%). Likewise, when insomnia was scored, the mean was 7.36 +/- 6.1. More than half of the participants, n=148 (58%) had no insomnia and only a small percentage n=9 (3.5%) participants were found to have severe insomnia.

Figs. 1 and 2 show the correlation between insomnia and anxiety and insomnia and depression respectively. A moderate correlation of 0.516 was observed when insomnia was correlated with anxiety, which had a highly significant value ($p=0.001$). Furthermore, when insomnia was correlated with depression, a moderate correlation of 0.694 was observed with a highly significant p value ($p=0.001$).

When the psychological well-being was being assessed through depression scores, a significant association was observed between levels of depression and different fields of healthcare professionals as shown in Table 1. A significant association was also observed when depression scores were corresponded to years of experience as shown in Table 2.

Association was observed between anxiety and occupation as well as anxiety with the years of experience. Healthcare workers predominantly suffered from mild anxiety out of which, majority were doctors, n=81 (83.5%), followed by allied healthcare workers, n=9 (60%), and nurses/paramedics, n=7 (43.8%). When anxiety was associated with years of work experience, mild anxiety was observed in participants n=57 (58.8%) having upto 5 years of experience, whereas those who had more than 5 years of experience were found to have no anxiety at all.

No significant association was observed when anxiety was associated with years of experience as majority were suffering from either no anxiety or mild anxiety.

Furthermore, correlation of insomnia with occupation and years of experience were also analyzed. Majority of the participants had no insomnia n=148 (58%) followed by sub-threshold

insomnia in n=74 (29%). It was also found that a majority of the doctors n=130 (58.8%) had no insomnia as compare to majority of the allied healthcare workers n=6 (40%) who were suffering from sub-threshold insomnia. In addition, participants with work experience of upto 5 years had no insomnia n=82 (52.6%) followed by n=48 (30.8%) having sub-threshold insomnia.

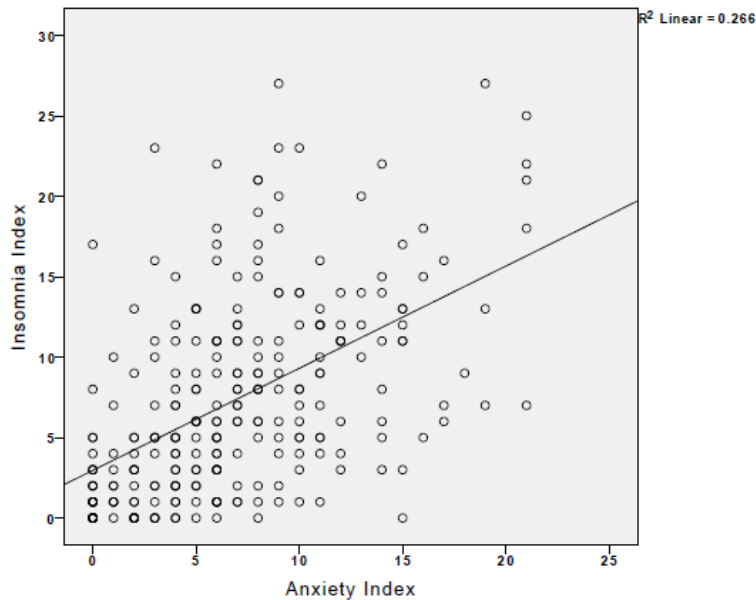


Fig. 1. Correlation between anxiety and insomnia (p<0.001)

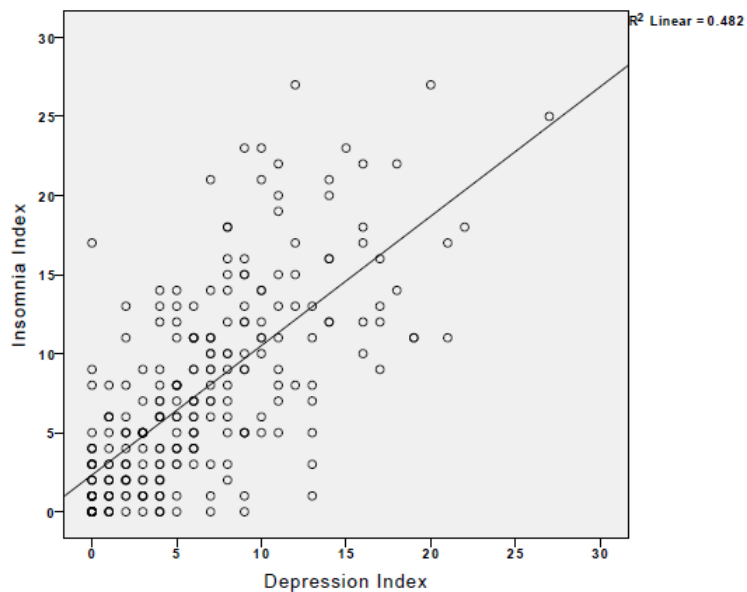


Fig. 2. Correlation between depression and insomnia (p<0.001)

Table 1. Association between depression scores and different fields of healthcare professionals (p=0.009)

Depression		Occupation		
		Doctor	Nurses & Paramedics	Allied Healthcare
No Depression	Within depression groups	93.9%	2.6%	3.5%
Mild Depression	Within occupation	47.8%	18.8%	26.7%
	Within depression groups	78.6%	14.3%	7.1%
Moderate Depression	Within occupation	29.5%	75.0%	40.0%
	Within depression groups	86.8%	2.6%	10.5%
Severe Depression	Within occupation	14.7%	6.2%	26.7%
	Within depression groups	94.7%	0.0%	5.3%
	Within occupation	8.0%	0.0%	6.7%

Table 2. Association between depression scores and years of experience (p=0.010)

Depression	Years Of experience			
	Less Than 1 Year	1-5 Years	5-10 Years	Over 10 Years
No Depression	2.6%	54.5%	12.3%	30.7%
Mild Depression	2.4%	59.5%	19.0%	19.05%
Moderate Depression	7.9%	76.3%	13.2%	2.6%
Severe Depression	5.3%	78.9%	10.5%	5.3%

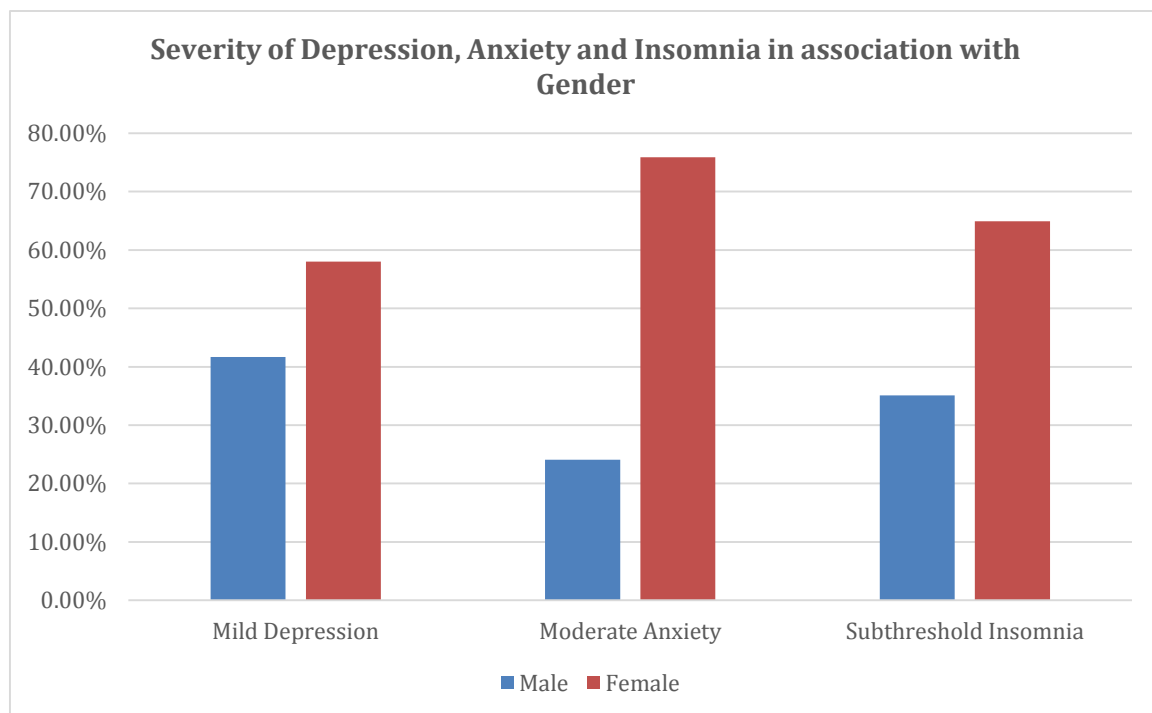


Fig. 3. Association between psychological distress and gender

It was also observed that as the work experience increased, participants had lower levels of insomnia and borderline significant association was found between insomnia and the number of years of work experience ($p=0.049$).

Association was observed between psychological distress and gender, which is illustrated in Fig. 3.

In addition public and private sector of work was compared to psychological distress. Most of the participants with sub-threshold insomnia, $n=48$ (64.9%), belonged to private work sector and the remaining $n=26$ (35.1%) were from the public sector of work and a significant association was found between insomnia and the sector of work ($p=0.042$).

4. DISCUSSION

A cross sectional survey was conducted on psychological wellbeing of health care professionals working during the unheralded public health challenge of COVID-19, a pandemic situation in Pakistan, specifically Karachi. In total, 255 healthcare professionals took part in the research. Participants who showed signs of depression, anxiety and insomnia were divided into groups and were further associated with age, gender, hospital sector and experience. Females (56.9%) showed mild depression and mild anxiety along with sub threshold insomnia with majority being 25-30 years old. Out of these $n=145$ females, mostly were doctors (88.27%) with upto 5 years of experience working in private sector. When analyzed with respect to gender, female healthcare workers were found to have more depression (58.3%), anxiety (57.5%) and insomnia (64.9%) as compared to the male counterparts which was similar to a study conducted in Wuhan Feb'20 [8]. Furthermore, during the times of acute SARS outbreak 89% of healthcare providers' psychological wellbeing was reported to be compromised [15].

When the findings of this research were correlated with other studies conducted on similar topics, it was concluded that the results were consistent with those of the others. A study conducted in Wuhan, China showed that healthcare providers working on frontline who were observed to have severe symptoms on all measurements were mostly female nurses between 26-40 years of age working in tertiary care hospitals [8]. Healthcare worker due to their

demanding job and patients expectations are already experiencing sufficient level of anxiety and depression but female practitioners in hospitals were more prone to have severe anxiety and depression compared to males due to their additional vulnerability towards work-home interferences [7]. Further studies also highlighted healthcare practitioners to be among the highly vulnerable members of the society as they were in close contact with the patients and exposed to various risk levels. The confirmation of person-to-person transmission of COVID-19 via respiratory droplets, limited number of PPE and long working hours contributed to stress and concerns among healthcare workforce [8,16,17,18,19]. Another study further stated that doctors' undergo depression more than other professionals and general population and puts on extra apprehension on psychological wellbeing of healthcare providers during COVID-19 or any pandemic crisis [8,20]. In one survey, 53 (23.04%) of 230 healthcare workers had psychosocial issues. More females (48 (90.57%)) than males (5 (9.43%)) and more nurses (43 (81.13%)) than physicians (10 (18.9%)) suffered from mental health problems as a result of the infectious outbreak among these 53 medical personnel. Females were more anxious than males (25.67% vs. 11.63%), and nurses were more anxious than doctors (26.88% vs. 14.29%) [21].

Depression and anxiety with respect to gender was compared to a local study conducted in Lahore during regular days and it was observed that doctors had mild (34%) to moderate (24.8%) anxiety and depression with more in females (59.99%) than males (25.0%) [22]. It was further noted that majority of the participants with mild depression had a clinical experience of 2 years (30%) or 3.5 years (23%) but predominantly all had experience less than 5 years (61.2%), while most of the healthcare professionals with over 10 years of experience (66%), had no depression. Similarly, another study also conducted in Lahore during non-pandemic days showed decreased depression and anxiety level in doctors with more years of work experience [22].

During times prior to COVID-19, multiple factors were found to have led to an increased rate of anxiety and depression among doctors. These factors included extensive workload, long working hours, arduous patients, restricted resources and critical decision making which being front-line workers, were all further exaggerated in time of COVID-19 [8,18].

According to a recent study conducted in Pakistan, (i) greater fatigue, (ii) greater family pressure, and (iii) decreased feelings of security, all positively influenced levels of anxiety in physicians during COVID-19. High workload was linked to greater fatigue ($\beta = 0.41$, $R^2 = 0.17$, $p < 0.001$) and family strain ($\beta = 0.47$, $R^2 = 0.22$, $p < 0.001$), according to structural equation modeling. Exhaustion ($\beta = 0.17$, $p < 0.005$), family pressure ($\beta = 0.34$, $p < 0.001$), and feelings of security ($\beta = 0.30$, $p < 0.001$) all explained anxiety ($R^2 = 0.28$) in a significant way [23].

In this study healthcare professionals were categorized into doctors, nurses/allied healthcare workers and paramedics. Among these doctors were found to be having sub-threshold insomnia with mild depression and anxiety as compared to other groups. In contrast, another study conducted in China concluded nurses to be having more psychological distress [8].

Healthy workplace environment plays a vital role in preventing depression among nurses and healthcare workers [24]. Nurses working in different department has contrasting anxiety and depression scores, higher levels were spotted in nurses working in psychiatric and intensive care unit due to more than usual traumatic events occurring in those departments [24]. Analysis of the study conducted showed that among the nurses/paramedics, (75%) suffered from mild depression and (43.8%) were suffering from mild anxiety during this unpredicted public health challenge. In contrast, a study conducted in Singapore during COVID-19 showed (8.1%) nurses suffering from depression and (10.8%) nurses having anxiety. This reduced level of psychological distress could be attributed to the past SARS exposure which might have resulted in the nurses in Singapore being more mentally prepared and having an idea and experience on how to work under these sort of pressures [25]. While a study conducted during SARS breakdown in Taiwan among healthcare workers in department of emergency showed nurses to develop more psychological distress than doctors due alterations in shifts, excess work load in tensed environment that might contribute to impaired work performance and errors of judgment [8,26]. Furthermore, according to a recent study based on data from the UK's first two waves, frontline workers in general, as well as specific frontline worker classes, had substantially higher prevalence estimates of depression, anxiety, and PTSD during both waves 1 and 2. The average rate of anxiety for

frontline staff was (22%) between waves one and two, according to GAD-7 cut-off ratings. In both waves, the average rate of depression for frontline workers was (24.4%) according to the PHQ-9 cut-off ratings. Finally, between waves one and two, the average prevalence estimate of PTSD for frontline workers was (37.5 %) according to the ITQ's diagnostic algorithm [27].

With more work experience comes more responsibility, although these professionals have demanded job but they also had access to additional alternatives and protocols that helps to balance anxiety to certain extent, while healthcare provider with less experience are new to work, still learning and have much less access to protocols and dominance which increases the risk of anxiety and depression [28]. Therefore, it also concluded that healthcare workers who had less work experience had more symptoms of psychological distress (76.7%) [26,8]. This was coherent with the findings of this study that showed mild anxiety in participants with less than one year of work experience (55.6%).

Most of the health care providers are working in between 35 to 120 hours in a week although this meticulous schedules help gained knowledge, practice and confidence but was accompanied by fatigues [29]. Sleep deprivation not only affects work performance but also one's immune system and therefore upon exposure, there are increased chances of being infected [8,11,30]. During this pandemic when many professionals were on duty for 25 hours straight and were titled as sleep-deprived group, sub-threshold insomnia was found to be most common among doctors, (28.6%), nurses/paramedics (25%) and allied healthcare (40%) respectively as compared to Wuhan where majority of the nurses and frontline workers were experiencing severe insomnia during this COVID-19 outbreak [8].

Occupational stress is related to disparity between job requirements and one's competency and the availability of resources, especially if the private and public sector of work are compared [30]. In this survey, participants working in private sector were facing mild depression, severe anxiety and severe insomnia, mostly among healthcare workers of 25-30 years of age. When this was compared to a study previously done in Bahawalpur District of Pakistan during the pre COVID-19 times, it was observed that there was a high prevalence of insomnia in public sector (mean 3.8 +/- 1.6) due to long working hours and late night shifts along with limited resources

leading to added stress and anxiety. In contrast to the private sector (mean 3.1 +/- 1.9) where duties are bit more flexible and better resources develops less stress and anxiety [30]. Another study conducted elsewhere revealed that the hospital setup demanded doctors to use limited supply and adapt fast, especially with a continuously reducing workforce as COVID-19 exposure had also been effecting frontline workers very frequently [31]. Results of both studies kept side-by-side presented opposite results suggesting of COVID-19 positive patients are directed to private sector as their first option for better treatment due to better resources available in time.

Among healthcare professionals, this study showed that 40% had depression, 97% had anxiety and 38% had insomnia whereas a study conducted in China stated 50.4%, 44.6% and 34% of the healthcare workforce to be having depression, anxiety and insomnia respectively in this pandemic era [8]. The findings of this study were also compared to a study conducted in Chicago during COVID-19 that focused on elements that further added to the distress to frontline workers. As a result of declaring multiple deaths daily, healthcare professionals ended up writing their own living wills. Healthcare workers with children were also found to be under a lot of additional pressure in managing home and work together which was becoming challenging [32].

The strength of this research was the data was collected from people who were actually frontline workers. The limitation of this study was the inability to opt for probability sampling as the data collection was done online. This also resulted in majority of the participants belonging to the younger age groups.

This study highlighted the healthcare professionals that are prone to develop psychological distress during COVID-19. As the pandemic crisis continues, principal clinical strategies are needed to assist health care professionals and therefore, development of a support system and counseling services should be initiated for psychological support to front line healthcare workforce.

5. CONCLUSION

Healthcare workers are highly vulnerable to psychological distress with varying levels of depression, anxiety and insomnia. Identifying the

impact of this catastrophe is extremely hard to recognize.

Data obtained from this study will be expedient for investigating the processes in the hospitals that can be modified for addressing and lowering the mental distress among healthcare providers in addition to how to grapple with next pandemic wave.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

This study was approved from the clinical research ethics committee of Ziauddin University, Karachi, on healthcare providers, belonging to the clinical divisions of medicine, working in different tertiary care hospitals of Karachi, Pakistan.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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