

# Effect of COVID-19 on Mental Health of Healthcare Professionals of Karachi

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## Abstract

**Objective:** To assess the effect of COVID-19 on the mental health of healthcare professionals from district central, Karachi.

**Methods:** A cross-sectional study was carried out from October 2021 to June 2022. The study population consisted of dentists, doctors, and dental/medical students of clinical years. Data collection from healthcare professionals was performed using an online questionnaire through different social networking sites such as WhatsApp and Facebook. Data was analyzed by SPSS version 21 whereas binary logistic regression was applied for inferential analysis.

**Results:** The study participants were  $31.54 \pm 8.64$  years old on average, 121 (59.0%) of them were aged up to 30 years, 110 (53.7%) of them were females, 99 (48.3%) of them were dentist whereas 57 (27.8%) were doctors by profession. Moreover, 100 (48.8%) participants were found to have an effect of COVID-19 on their mental health. Furthermore, multivariable logistic regression analysis revealed that both dentists and doctors had significantly lower odds of having an effect of COVID-19 on their mental health than dental/medical students of clinical years (AOR 0.16, 95% CI 0.06-0.42,  $p < 0.001$  and AOR 0.18, 95% CI 0.06-0.52,  $p = 0.001$  respectively).

**Conclusion:** Almost half of the healthcare professionals included in the study had an effect of COVID-19 on their mental health. Moreover, healthcare students had significantly higher odds of having such an effect than healthcare practitioners. Authors recommend provision of psychological counseling, implementation of safety measures and the availability of related protective equipment for the healthcare workers, particularly for dental and medical students, to enable them to deal with their patients in a minimal risk environment.

**Keywords:** COVID-19, Mental Health, Health Personnel

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## Introduction

Late in the year 2019, a highly contagious disease was first reported from Wuhan, Hubei Province, China, which later came to be known as the coronavirus disease (COVID-19). Due to its widespread transmission, the World Health Organization designated it as a pandemic<sup>1</sup>. Its symptoms inclu-

de sore throat, mild flu, cough, fever, breathing difficulties and pneumonia<sup>2</sup>.

The emergence of COVID-19 pandemic with very high infection and mortality rate has resulted in anxiety and fear among people globally. Literature reports fear among people of being in contact with COVID-19 infected individuals<sup>3</sup>. Healthcare workers in particular have to face many concerns because of this pandemic. They may experience physical uneasiness and difficulty in breathing while wearing personal protective equipment, which is crucial for their safety against the exposure of virus<sup>4</sup>. Moreover, there exists a fear of auto inoculation and of spreading the infection to their families and friends<sup>5,6</sup>.

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Effects of isolation on mental health of healthcare workers have been described previously<sup>7</sup>. During the COVID-19 epidemic, many health professionals became sick and had to be isolated or hospitalized. We have learned from prior experiences that health care workers who have been quarantined feel more worried, irritated, helpless, and lonely than non-healthcare workers<sup>8</sup>. Their greatest worry was the possibility of infection to themselves or their family members. In this context, acute stress reactions may include physical, social, cognitive, and emotional reactions<sup>9</sup>. Furthermore, Wong TW et al., in 2005 reported that psychologically, the response of health care professionals to an epidemic may lead to stress and anxiety<sup>10</sup>.

Several host factors may also affect the mental health of healthcare workers dealing with COVID-19 patients in various capacities. Arshad M S et al., in 2020 reported that the effect of COVID-19 on mental health was higher in nurses as compared to other healthcare workers, i.e., doctors, pharmacists, and supportive staff<sup>11</sup>. Furthermore, Salman M et al., in 2020 and Hayat K et al., in 2021 reported female healthcare workers aged 30 to 49 years to have more depression and anxiety due to COVID-19<sup>12,13</sup>. Overall, local literature reports adverse effect of the COVID-19 outbreak on the mental health of healthcare workers<sup>14,15</sup>. Despite the danger to themselves and their families, most healthcare professionals have opted to care for patients with COVID-19 infections.

To add to the currently available local literature regarding the relationship between COVID-19 pandemic and the mental health of healthcare professionals<sup>11-15</sup>, this study was conducted to assess the effect of COVID-19 on the mental health of healthcare professionals from district central, Karachi.

### **Subjects and Methods**

A cross-sectional study was carried out among healthcare professionals including dentists, doctors and dental/medical students of clinical years from October 2021 to December 2022. The study was conducted after getting due ethical approval.

For sample size estimation, the percentage frequency of the study outcome was kept at 50% that gives the maximum sample size of any percentage between 0% and 100%. The confidence level was kept at 95% whereas the precision at 7%, and the sample size was calculated to be 196 participants.

The data collection was performed by using an online questionnaire specially designed for the study. Participants were approached by the principal investigator using non-probability convenience sampling technique using different social networking sites such as WhatsApp, and Facebook. The initial part of the questionnaire contained a consent section to be filled in by every participant prior to answering the questions.

The study questionnaire was piloted on 10% of sample size to check for reliability and validity. The reliability of the questionnaire was assessed by calculating Cronbach's alpha that was found to be 0.867, indicating a good level of internal consistency. The face validity of the questionnaire was assessed by asking participants if the study questionnaire appeared to have assessed the impact of COVID-19 on their mental health. The content validity of the questionnaire was assessed by two public health experts. An online approach was used for this purpose. Relevance ratings of the items were decided and based on that item-level content validity index (I-CVI) was calculated by dividing the experts in agreement by total number of experts. Only those items were retained in the questionnaire whose I-CVI value was equal to 1.

The first section of the study questionnaire contained five questions related to socio-demographic characteristics of the respondents such as age, gender, marital status, education, and profession while the second section contained 13 questions to assess the effect of COVID-19 on the mental health of the participants. These questions included becoming uncomfortable by thinking about COVID-19, having sweaty hands after thinking about COVID-19, having fear of death from COVID-19, becoming anxious while watching news related to

COVID-19, being too worried by COVID-19 to become unable to sleep at night, experiencing palpitation when thinking about getting COVID-19, preferring to wash hands soon after shaking with somebody, becoming more frustrated by staying at home during COVID-19 pandemic, having fear of economic crisis due to COVID-19 related lockdowns, feeling that COVID-19 pandemic has brought too many difficulties to overcome, becoming angry because things are going beyond control, feeling stressed due to COVID-19 pandemic and having little appetite or overeating because of COVID-19 pandemic. The participants responded on a four-point Likert scale, ranging from “strongly disagree” to “strongly agree”. The minimum score possible for each question was 1, and the maximum was 4, where a higher score indicated a greater effect on mental health. Their mean effect score was generated which was classified into two categories, presence, or absence of impact, using a cut off of 50%.

Statistical Package for Social Sciences version 21 was used for data entry and analysis. Descriptive statistics were reported in terms of means and standard deviations and frequencies and percentages for continuous and categorical variables respectively whereas the inferential analysis was performed using binary logistic regression. Statistical significance was set at  $p \leq 0.05$ .

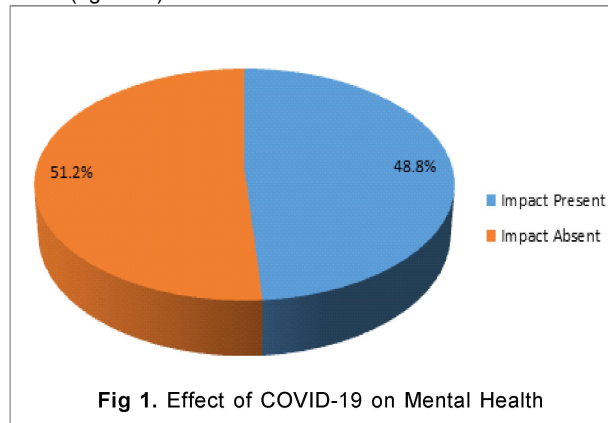
**Results**

With a 100% response rate, data of a total of 205 participants was analyzed. The study participants were  $31.54 \pm 8.64$  years old on average, 121 (59.0%) of them were aged up to 30 years, 110 (53.7%) of them were females, 99 (48.3%) of them were married, 151 (73.7%) of them were graduates, 99 (48.3%) of them were dentist whereas 57 (27.8%) were doctors by profession (Table 1).

**Table 1.** Participant Profile

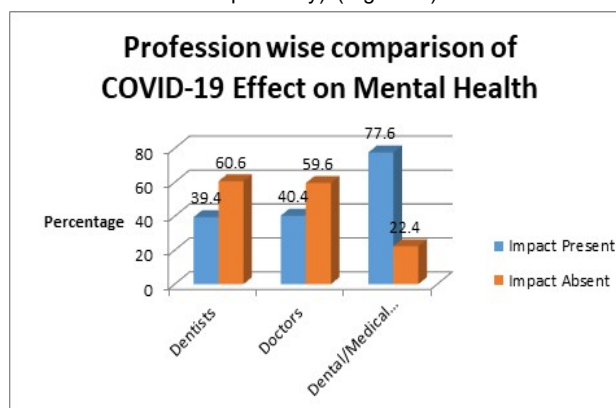
Participant Characteristics (n=205)	Mean $\pm$ SD/Count (%)
Age (Years)	31.54 $\pm$ 8.64
Age Category	
Up to 30 Years	121 (59.0)
More than 30 Years	84 (41.0)
Gender	
Male	95 (46.3)
Female	110 (53.7)
Marital Status	
Unmarried	96 (46.8)
Married	99 (48.3)
Divorced/Widowed/Separated	10 (4.9)
Education Level	
Graduation	151 (73.7)
Post-Graduation	54 (26.3)
Profession	
Dentist	99 (48.3)
Doctor	57 (27.8)
Dental/Medical Student of Clinical Years	49 (23.9)

The study results showed that overall, 100 (48.8%) participants had an effect of COVID-19 on their mental health (figure 1).



**Fig 1.** Effect of COVID-19 on Mental Health

Moreover, profession wise comparison showed dental/medical students to have greater effect of COVID-19 on their mental health than either dentists or doctors (77.6% vs. 39.4% and 40.4% respectively) (Figure 2).



**Fig 2.** Profession wise comparison of COVID-19 Effect on Mental Health

Univariate logistic regression analysis of the relationship between participant characteristics and the effect of COVID-19 on their mental health is shown in table 2. As the p values of all the variables were less than 0.25, they all were included in the final multivariable regression model.

**Table 2.** Univariate Analysis of association between Participant Characteristics and the Effect of COVID-19 on their Mental Health

Participant Characteristics (n=205)	COR	95% CI		p value
		Lower	Upper	
<b>Age Group</b>				
More than 30 Years	0.61	0.35	1.07	0.090
Up to 30 Years			<b>Ref</b>	
<b>Gender</b>				
Male	1.69	0.97	2.94	0.063
Female			<b>Ref</b>	
<b>Marital Status</b>				
Married	0.89	0.23	3.37	0.869
Divorced/Widowed/ Separated	0.43	0.11	1.63	0.217
Unmarried			<b>Ref</b>	
<b>Education Level</b>				
Post-Graduation	0.46	0.24	0.89	0.021
Graduation			<b>Ref</b>	
<b>Profession</b>				
Dentist	0.18	0.08	0.41	<0.001
Doctor	0.19	0.08	0.46	<0.001
Dental/Medical Students of Clinical Years			<b>Ref</b>	

Multivariable logistic regression analysis of the relationship between participant characteristics and the effect of COVID-19 on their mental health showed that after controlling for the potential confounding effects of all other variables, the profession of the healthcare workers was found to be significantly associated with the effect of COVID-19 on their mental health where both dentists and doctors had significantly lower odds of having an effect of COVID-19 on their mental health than dental/medical students of clinical years (AOR 0.16, 95% CI 0.06-0.42,  $p < 0.001$  and AOR 0.18, 95% CI 0.06-0.52,  $p = 0.001$  respectively) (table 3).

**Table 3.** Multivariable Analysis of association between Participant Characteristics and the Effect of COVID-19 on their Mental Health

Participant Characteristics (n=205)	AOR	95% CI		p value
		Lower	Upper	
<b>Age Group</b>				
More than 30 Years	1.53	0.62	3.76	0.348
Up to 30 Years			<b>Ref</b>	
<b>Gender</b>				
Male	1.82	0.98	3.37	0.055
Female			<b>Ref</b>	
<b>Marital Status</b>				
Married	1.14	0.51	2.54	0.733
Divorced/Widowed/ Separated	3.27	0.68	15.62	0.137
Unmarried			<b>Ref</b>	
<b>Education Level</b>				
Post-Graduation	0.39	0.15	1.01	0.052
Graduation			<b>Ref</b>	
<b>Profession</b>				
Dentist	0.16	0.06	0.42	<0.001
Doctor	0.18	0.06	0.52	0.001
Dental/Medical Students of Clinical Years			<b>Ref</b>	

## Discussion

The mental health problems faced by healthcare workers due to COVID-19 not only influence their attention and decision making, but also affect their overall well-being<sup>5</sup>. Taking care of mental health of the staff has been reported to be necessary for better control of communicable diseases<sup>16</sup>. The study results showed that 48.8% of the healthcare workers had an effect of COVID-19 on their mental health. Likewise, Menon GR et al., in 2022 reported 52.9% of the healthcare workers to have the risk of psychological distress<sup>17</sup>. Similarly, Kafle K et al., in 2021 reported 53.2% of the healthcare workers to have some level of distress due to COVID-19<sup>18</sup>. These findings are indicative of the magnitude of mental distress caused by COVID-19 among healthcare professionals.

The study results did not show the age of healthcare professionals to be significantly associated with the effect of COVID-19 on their mental health. Similar findings were reported by Huang JZ et al., in 2020<sup>4</sup>. This finding may be due to the fact that in terms of age, the risk of COVID-19 is more pronounced at the extremes where most of the healthcare workers do not belong. Unlike these findings though, Shrestha DB et al., in 2020 reported the

prevalence of distress to be higher among older individuals, including healthcare workers<sup>19</sup>. Further exploration of this relationship is therefore suggested.

The study results further showed that gender of the healthcare professionals was not significantly associated with the effect of COVID-19 on their mental health. A previous study by Huang JZ et al., in 2020 reported females to have a higher prevalence of mental discomfort than males<sup>4</sup>. Likewise, Kafle K et al, in 2021 reported female healthcare workers to have significantly more distress due to COVID-19 than males<sup>18</sup>. Similar findings were also reported by Al-Hanawi MK et al., in 2020<sup>20</sup>. It can be argued though that as there is no yet known gender predisposition to the effects of COVID-19, the effect of COVID-19 on the mental health of healthcare workers should be similar. Moreover, being a health professional, female healthcare workers can reasonably be expected to have similar level of awareness regarding COVID-19, and hence a similar effect on their mental health.

The study results also showed that education level of healthcare professionals was not significantly associated with the effect of COVID-19 on their mental health. Likewise, Al-Hanawi MK et al., in 2020 reported that amongst health workers education was not significantly correlated with distress due to COVID-19<sup>20</sup>. As all healthcare workers have fundamental knowledge of the risks associated with the COVID-19 outbreak, such a finding was not unexpected.

Healthcare professionals, both medical and dental, were found to have significantly lower odds of having an effect of COVID-19 on their mental health than clinical year students, both medical and dental. As the transition from healthcare student to healthcare professional is usually associated with an increase in the experience, knowledge and confidence, healthcare professionals are better equipped to deal with mentally distressing scenarios than healthcare students.

It is acknowledged that as the study was conducted on a single site, and had a moderate

sample size, the extent of generalizability of the study results is limited.

## Conclusion

Almost half of the healthcare professionals included in the study had the effect of COVID-19 on their mental health. Moreover, healthcare students had significantly higher odds of having such an effect than healthcare practitioners.

Authors recommend psychological counseling for vulnerable groups of Pakistani healthcare workers. Moreover, both public and private sector healthcare establishments should ensure implementation of safety measures and availability of related protective equipment for the healthcare workers, particularly for dental and medical students, to enable them to deal with their patients in a minimal risk environment.

## Conflict of Interest

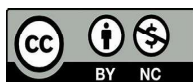
Authors have no conflict of interest and no grant/funding from any organization.

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