ORIGINAL RESEARCH

Coronavirus Disease (COVID-19) Associated Anxiety, Fear and Preparedness Among Healthcare Students at University Teaching Hospital in KSA

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Purpose: The infectious pandemics are generally accompanied by an often-overlooked impact it has on the psychology of the masses. Healthcare students and workers are expected to develop significant levels of stress as compared to the general population. The significance of this study is to assess the depression, anxiety and stress faced by the healthcare students that may lead to unfavourable effects on learning and their overall psychological health.

Methods: This assessment was done by means of an anonymous, online, closed-ended questionnaire. DASS-21 scale was the primary instrument used for this purpose. The responses were recorded on a 4-point Likert scale.

Results: The study had more male students, majority were between 21 and 23 years of age, asymptomatic and almost equal proportion of students from the fraternity of dentistry, medicine, pharmacy and nursing. Dental and pharmacy students were associated with lower stress than medical students whereas nursing students experienced higher anxiety as compared to medical students. Close contact with confirmed COVID-19 cases experienced higher stress and anxiety. Daily patient exposure was associated with significantly higher stress anxiety and depression.

Conclusion: Based on the observations of the present study, a support program for psychological training for these health care students should be introduced.

Keywords: COVID-19, DASS, Saudi Arabia, healthcare, students

Introduction

The Coronavirus disease (COVID-19) is being regarded as the worst-hit pandemic of the century to date.[1] It is caused by the SARS-CoV-2 virus and has rapidly reached global proportions. It is declared a highly infectious disease by the World Health Organization (WHO). Fever, nasal congestion, headache, cough, sore throat, shortness of breath, nausea, vomiting, diarrhoea, etc. are the varied clinical symptoms of COVID-19.[2] The pandemic has transgressed the borders of 220 countries and resulted in 278 million confirmed cases including 5.4 million deaths worldwide within two years (28th December 2021).[3] Alone Saudi Arabia has witnessed 553,921 confirmed cases including 8873 deaths till 28th December 2021.[4]

The radical measures taken in an attempt to control the growing pandemic, such as quarantine of entire communities, country-wide lockdowns, shut down of schools, social isolation, and shelter-in-place orders, have abruptly changed the routine lives of the common man.[5] COVID-19 has caused unprecedented disturbances and disordering of

875

the entire medical education system which may have adverse consequences over the worldwide healthcare systems.[6] Maintaining and equipping an adequate health care workforce in this present crisis requires not only recruiting an adequate number of healthcare workers but also requires potentiating the capacity of each healthcare worker to efficiently take care of a large volume of patients. Given the fact that surges in critically ill patients could last weeks to months, it is also very essential that health care professionals be able to perform according to their full potential over an extended time horizon.[7] Recognizing the possibility that the COVID-19 pandemic could result in scarcity of health care workers, healthcare students may need to be engaged as part of the workforce and especially in the clinical environment.[7]

Today, in most medical schools, students should be present physically during the first 12 to 18 months for interactive problem-solving sessions or discussions in small groups; their physical presence in both in-patient and out-patient settings has been an unquestioned tenet of early clinical immersion, experiences and the clerkship curriculum. The last 18 months of medical school may be individualized, with students participating in advanced clinical rotations, sub-internships before residency, or scholarly projects. COVID-19 has the potential to affect students throughout the medical educational process.[8] The emergence of COVID-19 has extremely disrupted medical education and requires an intense and instantaneous attention from the medical education system across the nations. The need to prepare future medical practitioners has never been more intense than it is now, in the background of this global crisis.[9] Moreover, also coping up with the societal shifts and emotional anxieties faced by all humankind, medical professionals face a higher risk of exposure, extreme workloads, moral dilemmas, and a constantly changing work environment that varies greatly from what they are accustomed to.[10]

The infectious pandemics are generally accompanied by an often-overlooked impact it has on the psychology of the masses.[11] The general population, including healthcare workers is prone to this silent pandemic. Healthcare workers invariably subjected to this deceptive pandemics, are expected to develop significant levels of stress as compared to the general population. Numerous factors may contribute to the perceived altered anxiety levels among the healthcare workers, such as the fear of contracting the infection; fear of transmitting the infection to their loved ones; scarcity of evidenced-based knowledge and awareness; questionable quality of the information shared in the official websites or the social media; and shortage of personal protective equipment (PPE) kits.[12] From these observations, we hypothesized that the COVID-19 outbreak may have a serious adverse impact on the mental health of medical students. The significance of the study is to explain the psychological stress that may lead to unfavorable effects on learning and the overall psychological health of students. Many researchers have addressed similar issues among hospital workers and residents; however, studies related to healthcare students are scarce.

Hence, we have conducted a descriptive cross-sectional study among the healthcare students at teaching hospitals in KSA, intending to assess the psychological effects of the COVID-19 pandemic on healthcare students.

Materials and Methods

The present cross-sectional study was conducted among healthcare students at different teaching college hospitals across the Kingdom of Saudi Arabia including Medicine, Dentistry, Nursing, and Pharmacy. The students already diagnosed with some other mental and psychological illnesses were excluded from the study. The students were selected by the simple random convenience sampling technique. An anonymous, self-explanatory, questionnaire was designed to assess the depression, anxiety, and stress-related to the current COVID-19 pandemic. The study design was presented before the institutional ethical review board at the College of Dentistry, King Khalid University, Saudi Arabia to obtain ethical clearance (IRB/KKUCOD/ETH/2020-21/020). The present study was carried online in full accordance with the regulations laid down by the Declaration of Helsinki concerning research on human participants. Electronic informed consent was attached before the questionnaire in the provided links and the participants had approved before filling the questionnaire.

The online questionnaire was prepared in both English and Arabic language using Google forms and distributed among participants through social media and E-mail as face-to-face interviews had to be avoided following the social distancing norms enforced by the government.

Table 1 Grading of Depression, Anxiety, and Stress

Meaning	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+

A pilot study was conducted on 16 participants, equally selected from each teaching hospital, to increase the credibility of the questionnaire. The pilot responses were excluded from the final responses of the study. The main aim of the pilot study was to incorporate suggestions from the participants, to make the questionnaire more comprehensive and understandable. The questionnaire was modified according to the reviewer's comments before the final approval. The survey was completed by participants from 3rd December 2020 to 12th March 2021. The response rate of the subjects in the current study was 90.90% (642 responded out of total 706 contacted). A total of 642 respondents completed the survey out of which 617 responses were selected for final analysis. Twenty-five participants had to be omitted due to incorrect or incomplete completion of the questionnaire.

The questionnaire was categorized into three parts: (1) Demographics and general characteristics (6 items): was obtained by both open and close-ended questions. (2) Physical symptoms and health status (5 items): information related to systemic health was obtained through closed-ended questions that should be answered only in "Yes" or "No". Concerning symptoms were selected based on similarity towards the symptoms of COVID-19 such as fever, difficulty in breathing, dry cough, body ache, and fatigue. (3) Stress, anxiety, and depression (21 items): Modified short-term Depression Anxiety and Stress Scale 21 (DASS 21)[13] was used to assess the prevalence of stress, anxiety, and depression among respondents. This particular scale is a recognized instrument to measure the principal symptoms of depression, anxiety, and stress in research related to virus-epidemics.[14,15]

The scale comprises a total of 21 items and is further divided into three sub-scales of stress, anxiety, and depression each consisting of 7 equal items. The total score from each subsection can range from normal to extremely severe. The students responded to the items on a 4-point Likert scale (0=never a problem, 1=sometimes a problem, 2=often a problem, and 3=almost always a problem). In more detail, depression, anxiety, and stress were graded into normal, mild, moderate, severe, and extremely severe depending on the score range as described in Table 1.[16]

The collected data was cleaned, coded, entered in Excel, and analyzed by using Statistical Package for Social Sciences (SPSS; IBM SPSS Inc., Chicago, version 15). Descriptive analysis was used to assess the characteristics of the participants. Linear regression was performed to predict the association between predicted variables and the sum scores of the DASS-21 subscales. P-values less than 0.05 were considered to be statistically significant.

Results
Demographic Information and Characteristics of the Respondents

Table 2 shows descriptive statistics related to demographic data and characteristics of the respondents enrolled in the survey. A total of 616 students voluntarily participated in the survey, out of that 318 (51.7%) were male and 298 (48.3%) were female. The majority of respondents, 327 (53.1%) were aged between 21–23 years, however, only 67 (10.9%) respondents reported to be medically compromised (have chronic illness). While considering the distribution of respondents among different faculties, dental students contribute to the largest portion 179 (29.1%) followed by medical 154 (25%), nursing 149 (24.2%) and pharmacy 134 (21.8%) respectively. Out of the total, more than half (64%) of the respondents belong to the 3rd (level 5 and 6) and 4th (level 7 and 8) academic year.

Table 2 Characteristics of the Participants (N=616)

Variable	Variants	Frequency (n) Percentage (%)
Gender	Male	318 (51.7)
	Female	298 (48.3)
Age (in years)	20	135 (21.9)
	21–23	327 (53.1)
	>24	154 (25.0)
Faculty	Dental	179 (29.0)
	Medical	154 (25.0)
	Nurse	149 (24.2)
	Pharmacy	134 (21.8)
Level of education	5	108 (17.5)
	6	50 (8.1)
	7	100 (16.2)
	8	138 (22.4)
	9	27 (4.4)
	10	51 (8.3)
	11	97 (15.8)
	12	45 (7.3)

Only 190 (30.8%) respondents revealed that they experienced significant symptoms similar to COVID-19 infection, whereas the majority, 426 (69.2%) were without any significant symptoms. Among all the participants, 325 (52.8%) were in close contact with the COVID-19 positive patients. Whereas, only 121 (19.6%) of the participants reported that they have been diagnosed with COVID-19 infection by reverse transcription polymerase chain reaction (RT-PCR) test. When asked about the frequency of exposure with patients in the clinics or hospital, the majority 278 (45.1%) of the participants recorded a weekly exposure (Figure 1).

Survey Respondents

Psychological status during COVID-19 pandemic were measured using the DASS-21 scale. The sample mean scores for the DASS-21 subscales were 2.31 ([standard deviation] SD= 1.41) for stress, 2.86 (SD=1.64) for anxiety, and 2.60 (SD=1.47) for depression (Table 3).

Association with Socio-Demographic Variables

Most of the respondents were males (51.7), aged 21 to 23 years (53.1), and dental students (29.1). Age group 21 to 23 was significantly associated with higher stress (Beta [B]=1.67), 95% (confidence interval [CI]: 0.69 to 2.81). Male respondents reported significantly higher stress (B=0.320, 95% CI: 2.56 to 4.15), anxiety (B= 0.240, 95% CI: 1.62 to 3.16) and depression (B= 0.291, 95% CI: 2.31 to 3.95) than female respondents. Dental students were significantly associated with lower stress (B= −0.189, 95% CI: −3.28 to −1.05), anxiety (B=−0.326, 95% CI: −4.61 to −2.53) and depression (B= −0.269, 95% CI: −4.31 to −2.04) than medical students. Pharmacy students was significantly associated with lower anxiety (B= −0.202, 95% CI: −3.55 to −2.53) and depression (B= −0.175, 95% CI: −3.50 to −1.06) than medical
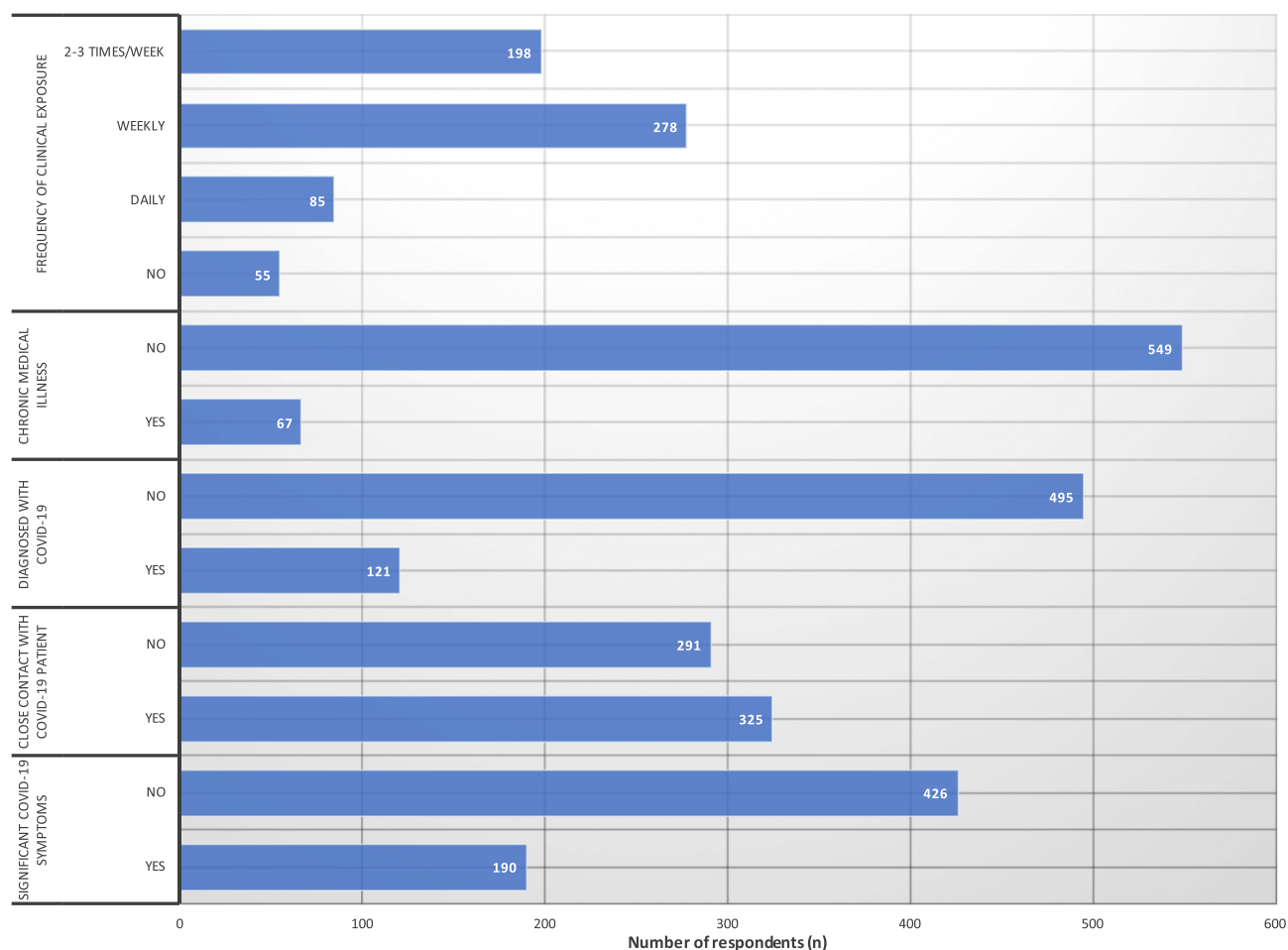
Figure 1 Physical symptoms and health status of the respondents.

students, while nursing students were significantly associated with higher anxiety (B= 0.184, 95% CI: 1.05 to 3.23) as compared to the medical students. Furthermore, the respondents belongs to educational level seven showed significantly higher anxiety (B= 1.61, 95% CI: 0.846 to 3.49) than level five (Table 4).

Association with Physical Symptoms and Health Status

Close contact with confirmed COVID-19 cases were significantly associated with higher stress (B= 1.15, 95% CI: 0.373 to 2.04) and anxiety (B= 1.63, 95% CI: 0.844 to 2.40). Medical illness were significantly associated with higher stress

Table 3 Demographic Information and Characteristics of the Respondents

	Stress	**Anxiety**	**Depression**
Scores Mean ± SD	2.31 ± 1.41	2.86 ± 1.64	2.60 ± 1.47
Normal	272 (44.2)	206 (33.4)	218 (35.4)
Mild	79 (12.8)	88 (14.3)	76 (12.3)
Moderate	103 (16.7)	74 (12)	146 (23.7)
Severe	90 (14.6)	77 (12.5)	73 (11.9)
Extremely severe	59 (9.6)	169 (27.4)	99 (16.1)

Table 4 Stress, Anxiety, and Depression in Association with Socio-Demographic Variables

Variable	N (%) (N=616)	Stress			Anxiety			Depression		
		R^2	AR^2	B (95% CI)	R^2	AR^2	B (95% CI)	R^2	AR^2	B (95% CI)
Age >24 21–23 20	154 (25%) 327 (53.1%) 135 (21.9%)	0.017	0.014	−0.100 (2.41–0.011) 1.67** (0.69–2.81) Ref.	0.015	0.012	0.006 (−1.07–1.22) 1.20 (0.203–0.219) Ref.	0.006	0.003	−0.026 (−1.57–0.919) 0.092 (0.86–2.07) Ref.
Gender Male Female	318 (51.7%) 298 (48.3%)	0.103	0.101	0.320* (2.56–4.15) Ref.	0.058	0.056	0.240* (1.62–3.16) Ref.	0.085	0.083	0.291* (2.31–3.95) Ref.
Faculty Dental Pharmacy Nurses Medical	179 (29.0%) 134 (21.8%) 149 (24.2%) 154 (25%)	0.029	0.024	−0.189* (−3.28–1.05) −0.092 (−2.37–0.044) 0.022 (0.021–0.921) Ref.	0.071	0.067	−0.326* (−4.61 −2.53) −0.202* (−3.55 −2.53) 184* (1.05–3.23) Ref.	0.053	0.049	−0.269* (−4.31–2.04) −0.175* (−3.50–1.06) 0.086 (0.57–0.110) Ref.
Education 12 11 10 9 8 7 6 5	45 (7.3%) 97 (15.8%) 51 (8.3%) 27 (4.4%) 138 (22.4%) 100 (16.2%) 50 (8.1%) 108 (17.5%)	0.020	0.008	0.035 (−1.11–2.51) −0.062 (−2.32–0.542) −0.039 (−2.47–0.993) −0.008 (−2.41–1.98) −0.071 (−2.23–0.427) 1.32 (0.450–3.28) −0.080 (−3.35–0.218) Ref.	0.053	0.042	0.116 (0.519–3.90) −0.08 (−2.48–0.182) 0.006 (−1.52 1.72) −0.044 (−3.13 0.981) −0.099 (−2.41–0.040) 1.61** (0.846–3.49) −0.109 (−3.67–0.357) Ref.	0.035	0.024	0.076 (−2.86–3.40) −0.082 (−2.66–0.249) 0.005 (−1.67–1.86) −0.006 (−2.34–2.09) −0.041 (−1.86–0.810) 1.59 (0.867–3.74) −0.059 (−2.98–0.627) Ref

Notes: *P-value<0.05. **P-value <0.01.
Abbreviations: B, beta; R2, R-squared; AR2, adjusted R-squared; CI, confidence interval.

(B= 1.53, 95% CI: 1.23 to 3.88), anxiety (B= 1.87 95% CI: 1.74 to 4.23) and depression (B= 1.35, 95% CI: 0.982 to 3.71). Similarly, weekly patient exposure was associated with significantly higher anxiety (B=0.209, 95% CI: 0.693 to 3.49) and depression (B= 214, 95% CI: 0.714 to 3.89), but not with stress. Moreover, frequency of exposure to patients on daily basis was associated with significantly higher stress (B= 0.184, 95% CI: 0.856 to 4.67), anxiety (B=373, 95% CI: 3.73 to 7.02) and depression (B=0.240, 95% CI: 1.88 to 5.57). However, physical symptoms and diagnosis with COVID-19 were not significantly associated with stress, anxiety, and depression (Table 5).

Discussion

The Depression, Anxiety, and Stress scale (DASS-21) is the primary instrument used in the present research. It is tripartite consisting of depression, anxiety, and stress scales. The DASS depression scale is characterized by a loss of self-confidence and motivation and is related to a low keenness of achieving the essential and important objectives of life.[17] The DASS Anxiety scale emphasizes the relationship between the lasting state of anxiety and the severe response to fear. It highlights the fear-related symptoms such as nervousness and apprehension related to certain situations.[16] The content of the DASS Stress scale suggests that it is measuring a state of persistent agitation with a reduced threshold to become upset or frustrated. In addition to computing anxiety and depression, DASS scales also differentiate them from the associated state of stress.[17]

The present study assessed the psychological effects of the COVID-19 pandemic on healthcare students at teaching hospitals in KSA. The sample mean scores for the DASS-21 subscales were 2.86 (SD=1.64) for anxiety, 2.60 (SD=1.47) for depression, and 2.31 (SD=1.41) for stress.

In the current survey, the age group ranging from 21 to 23 years was significantly associated with higher stress. Male respondents reported significantly higher anxiety and depression than female respondents. Furthermore, the higher educational levels even showed significantly higher anxiety as compared to level lower levels (level 5). In a similar study carried out amongst the medical students in Indonesia, out of a total of 1027 students, 47.8% had anxiety, 44.6% had stress and 18.6% had depression.[18] Their gender ($P < 0.001$) and educational status ($P < 0.001$) had a significant association with stress, anxiety, depression and Fear of COVID-19 Scale (FCV-19S).[18]

The findings in our study may be because these health care students had significant exposure to the infected patients, so increased possibility of contracting COVID-19 infection during their training and transmitting it to their families and friends. In the present survey, close contact with confirmed COVID-19 cases was significantly associated with higher stress and anxiety. Moreover, daily exposure to infected patients was significantly associated with higher stress, anxiety, and depression in this study.

The prevalence of depression, anxiety, and stress with the DASS-21 in the COVID-19 outbreak was also assessed among 3122 Bangladeshi university students aged 18 to 29 years (59.5% males; mean age 21.4±2 years). Prevalence estimates of depression, anxiety and stress were 76.1%, 71.5% and 70.1% respectively for mild symptoms, 62.9%, 63.6% and 58.6% for moderate symptoms, 35.2%, 40.3%, and 37.7% for severe symptoms and 19.7%, 27.5% and 16.5% for very severe symptoms.[19] The levels of fear of COVID-19, stress, anxiety, and depression were also assessed among 640 undergraduates from Ecuador during the lockdown. The resulting mean levels for stress, anxiety, and depression were above the levels to be considered non-pathological.[20]

Similar studies were carried out assessing the psychological impact of the pandemic on the Healthcare workers (HCWs). HCWs being at the forefront, have a crucial role in the management and control of the ongoing COVID-19 pandemic. Such pandemics have a major psychological effect and impact on the performance, in terms of concentration, cognitive function, and clinical decision-making amongst the HCWs.[21] In a study carried out amongst the healthcare workers at a tertiary care hospital in the north central region of India, the paramedical staffs were more stressed as compared to doctors due to frequent changes in protocols, emotional exhaustion, and conflicts at the workplace. The factors like observing the colleagues recuperating and aspirations for financial compensation were reported as stress busters; family compensations in the case of death at the workplace and disability benefits were more effective motivational factors for the paramedical staff (p<0.05).[22] The COVID-19 pandemic was associated with mild psychological impact among adults in the MENA region while it encouraged some positive impact on family support and mental health awareness.[23]

Table 5 Stress, Anxiety, and Depression in Association with Physical Symptoms and Health Status

Variable	N (%) (N=616)	Stress			Anxiety			Depression		
		R2	AR2	B (95% CI)	R2	AR2	B (95% CI)	R2	AR2	B (95% CI)
Symptoms Yes No	190 (30.8%) 426 (69.2%)	0.009	0.008	−0.096 (−1.99–0.186) Ref.	0.012	0.010	−0.109 (−202–0.326) Ref.	0.011	0.010	−0.105 (−2.14 −0.307) Ref.
Close contact Yes No	325 (52.8%) 291 (47.2%)	0.013	0.012	1.15* (0.373–2.04) Ref.	0.027	0.025	1.63* (0.844–2.40) Ref.	0.012	0.010	1.09 (0.320–2.02) Ref.
Diagnosed Yes No	121 (19.6%) 495 (80.4%)	0.006	0.005	−0.0079 (−2.09–0.008) Ref.	0.012	0.010	−0.109 (−2.35–0.376) Ref.	0.003	0.001	−0.056 (−1.82–0.320) Ref.
Medical illness Yes No	67 (10.9%) 549 (89.1%)	0.023	0.022	1.53* (1.23–3.88) Ref.	0.035	0.033	1.87* (1.74–4.23) Ref.	0.018	0.017	1.35* (0.982–3.71) Ref.
Exposure frequency 2–3 week Weekly Daily No exposure	198 (32.1%) 278 (45.1%) 85 (13.8%) 55 (8.9%)	0.022	0.017	0.049 (−1.16–2.26) 0.064 (−0.995–2.34) 0.184* (0.856–4.67) Ref.	0.076	0.071	0.166 (0.323–3.22) 0.209* (0.693–3.49) 0.373* (3.73–7.02) Ref.	0.027	0.022	0.157 (0.161–3.43) 0.214* (0.714–3.89) 0.240* (1.88–5.57) Ref.

Note: * P-value<0.05.
Abbreviations: B, beta; R2, R-squared; AR2, adjusted R-squared; CI, confidence interval.

Another study observed that about ten percent of 218 Italian HCWs reported moderate to extremely severe symptoms of depression, anxiety, and stress during the COVID-19 lockdown.[24] In a survey of Australian and New Zealand critical care healthcare workers, between 22 and 29% of respondents reported moderate to extremely severe depression, anxiety, and stress symptoms, with women reporting higher scores than men.[25] In yet another study the prevalence rates of depression, (DASS-depression>9) anxiety (DASS-anxiety>7) and stress (DASS-stress>14) were 37.8%, 43.0% and 38.5%, respectively in Chinese HCWs.[26]

In China, frontline healthcare workers engaged in the direct diagnosis, treatment, and care of patients with COVID-19 were associated with a higher risk of symptoms of depression (P=0.01), anxiety (P<0.001), insomnia (P<0.001), and distress (P<0.001).[27] The health care workforce should be supported and well equipped to provide care for their patients and communities. The shortage of Personal Protective Equipment (PPE) in clinical settings gives rise to the development of adverse mental status amongst these workers.

In addition to the effect on the healthcare students and the HCWs, various studies have been conducted assessing the impact on the general population. Throughout the early stage of the COVID-19 outbreak in Saudi Arabia, the results showed that nearly one-fourth of the sampled general population experienced moderate to severe psychological impact. Out of 1160 respondents from the general population of Saudi Arabia, 23.6% reported moderate or /severe psychological impact. The analysis revealed 28.3%, with moderate to severe depression whereas 24%, and 22.3% reported to have moderate to severe anxiety and stress symptoms respectively.[28]

A multi-center study carried out across 7 countries in the Asian general population showed that the Thai population reported the highest mean Impact of Event Scale-Revised (IES-R) and DASS-21 scores. In contrast, Vietnamese reported the lowest mean scores in IES-R and DASS-21 scales.[29]

The result of a study conducted on the Austrian general population revealed that 43.3% of respondents reported moderate (5.6%) or severe (37.7%) psychological impact of the disease. In addition, 26.5% revealed moderate (13.3%) to severe (13.2%) level of depression; 20.3% moderate (8.9%) to severe (11.4%) level of anxiety and about 21.2% participants reported that they have experienced moderate (10.5%) or severe stage of stress (10.7%).[30] Moreover in the Austrian general population, higher age and lower levels of education were significantly associated with a higher psychological burden for females.[30] The risk factors for having adverse mental health effects included age less than 30 years and higher education background in the Asian general population during the COVID-19 pandemic.[29]

Finally, we could not control all the possible factors that led to few limitations in present study. The cross-sectional nature of the study cannot confirm the causality association between compared variables. The self-reported responses could over or underestimate the result. We have not included the area of residency of the participants which could increase stress because of chances of contracting infection to the family members.

Conclusion

Current study had more male students, majority were between 21–23 years of age and were asymptomatic. Dental and pharmacy students were associated with lower stress than medical students whereas nursing students experiences higher anxiety as compared to medical students. Close contact with confirmed COVID-19 cases experienced higher stress and anxiety. Daily patient exposure was significantly associated with higher stress anxiety and depression.

Based on the observations of the present study, a support program for psychological training for these health care students should be introduced. This can go a long way to reduce the impact of depression, anxiety, and stress among them and promote the psychological health of these students.

Abbreviations

DASS-21, modified short-term Depression Anxiety and Stress Scale 21; COVID-19, coronavirus disease-19; PPE, personal protective equipment; IRB, institutional review board; SD, standard deviation; FCV-19S, Fear of COIVD-19 Scale; HCWs, healthcare workers; B, beta; R2, R-squared; AR2, adjusted R-squared; CI, confidence interval.

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Disclosure

The authors report no conflicts of interest in this work.

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