The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

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Abstract

Background: Burnout is defined by WHO as a syndrome resulting from chronic workplace stress that has not been effectively managed. Burnout was considered as a work-related occurrence, however, it might likewise exist in students.

Aim: To determine the prevalence of burnout among healthcare students in Makkah city, Saudi Arabia during the COVID-19 pandemic.

Materials and Methods: This study followed the descriptive, cross-sectional, survey-based study design, including healthcare students in Makkah city, Saudi Arabia. To achieve the study's aim, a paper and electronic questionnaire (BCSQ-12-SS) consisting of 12 questions covering domains of overload (4 questions), lack of development (4 questions), and neglect (4 questions) was distributed to the healthcare students between December 11, 2021 and March 3, 2022. Data were collected in Excel and entered into SPSS for analysis.

Results: This study found out that of the 517 healthcare students, female students (25%) showed a higher percentage of burnout than males (17%). It also found out that that 5th, 3rd and 6th year students showed a significantly higher level of agreement on total burnout score as compared to other students.

Conclusion: Based on the findings of this study, burnout among medical students is an issue that cannot be overlooked. Its presence in the medical students is alarming and an interference should be considered.

Keywords: Burnout; Healthcare Students; COVID-19 Pandemic

Introduction

Background

The World Health Organization (WHO) has stated the coronavirus disease 2019 (COVID-19) as a Public Health Emergency International Concern (PHEIC) [7]. This pandemic has left healthcare workers around the world struggling with difficult challenges in overcoming the pandemic and its consequences [8]. The pandemic has caused considerable panic, and the healthcare providers is under unprecedented stress as a result of its rapid spread, high-intensity work, long shifts and thus they are at a high risk of infection [7].

The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

02

In order to prevent the spread of infection, most countries around the world have taken drastic measures. Following the discovery of the first case in Saudi Arabia, the government responded quickly and effectively, launching a social media campaign encouraging people to stay at home and practice social distancing [4].

Burnout is defined by WHO as a syndrome resulting from chronic workplace stress that has not been effectively managed. It is divided into three dimensions: depletion of energy, increased mental distance from one's job, and diminished professional efficacy [6].

A study from the United Arab Emirates by Al-Rawi., *et al*. [1] aimed at assessing the Prevalence of Burnout among Dental Students during COVID-19 Lockdown. This cross-sectional observational study used the burnout clinical subtype questionnaire (BCSQ-12-SS) to assess such a prevalence. Among the 500 dental students from the University of Sharjah (UOS) and Ajman University of Science and Technology (AUST), 74% were females. The study concluded that there were no statistically differences in terms of the relationship between burnout and some sociodemographic variables, including age, gender, relationships, distance from family, residency, year of study, studying hours, and number of failed subjects. However, it also found that there was a significant association between burnout and receiving a scholarship and family support. Moreover, From the results of regression analysis, it has been seen that weekly studying hours were a significant predictor of overload, while scholarship was a significant predictor of neglect scores. There were no significant predictors regarding lack of development or total burnout.

In Poland, Forycka., *et al*. [2] assessed the status of burnout among the Polish medical students due to COVID-19. For burnout, the researchers used (Maslach Burnout Inventory) as their scale. In this regard, the respondents presented lower exhaustion (p = 0.003) and cynicism (p = 0.02), and higher academic efficacy (p = 0.002). Additionally, the students with burnout reported reduced motivation to learn significantly more often. Furthermore, the study reported that the prevalence of burnout was at its lowest for the fourth-year students.

A study titled as "Medical Studies during the COVID-19 Pandemic: The Impact of Digital Learning on Medical Students' Burnout and Mental Health" by Zis., *et al*. [9] investigated the prevalence of burnout due to COVID-19 among 189 medical students in Cyprus. The mean age of the participants was 22.6 ± 4.1 years, while most of them (69.5%) were females. The study used Maslach Burnout Inventory and found out that the overall burnout prevalence did not differ significantly between the two periods (pre-COVID-19 18.1% vs. COVID-19 18.2%). The study also showed that the burnout prevalence dropped significantly in year 4 (pre-COVID-19 40.7% vs. COVID-19 16.7%, p = 0.011), whereas it increased significantly in year 6 (pre-COVID-19 27.6% vs. COVID-19 50%, p = 0.01). Moreover, the study argued that burnout was found to affect almost one in five medical students, with higher levels in the clinical years. Such higher prevalence of burnout in the year when clinical training begins has been observed in numerous studies of burnout.

In Romania, Silistraru., *et al*. [5] investigated the prevalence of burnout in Romanian medical students during the COVID-19 pandemic using the Maslach Burnout Inventory-General Survey for Students (MBI-GS(S)). a number of 126 Romanian medical students at two leading medical schools in the country were investigated. The MBI-GS(S) group report revealed that 36.5% of the medical students in the sample (46) experienced burnout. This study also found out that higher stress levels were significantly associated with the female gender and international status. One of the main conclusions is that the consequences of burnout in medical students play a significant role in shaping the future healthcare practitioners' perception of the medical profession and of patients' wellbeing.

In the light of this introduction, this current study is to determine the prevalence of burnout among healthcare students in Makkah city, Saudi Arabia during the COVID-19 pandemic.

Objectives of the Study

Primary objective

The current study aims to determine the prevalence of burnout among healthcare students in Makkah city, Saudi Arabia during the COVID-19 pandemic.

The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

03

Secondary objectives

- To compare the burnout levels between different colleges.
- To investigate the association between burnout and socio-demographic variables.

Methodology

Study design

This study was designed a cross-sectional survey. An electronic and paper questionnaire was used to collect the required data.

Sample size determination

The minimum number of participants was needed for this study is 271 using estimated prevalence of 50%, precision level of 5% and confidence interval of 90%. However, 380 invitations were sent for expected 40% dropout.

Study population

The target sample in this study was healthcare students.

Inclusion criteria

All students attending healthcare colleges in Makkah city, Saudi Arabia.

Exclusion criteria

Graduated students.

Study procedures

An electronic/ paper questionnaire was collected from the students. This study was based on a structured self-reported question-naire. The questionnaire was derived from a previous study [1] with some modifications. It is composed of two sections. The first section covers the socio-demographic characteristics of the participant; like the college, age, gender, participant's relationship status, place of residency (with parents, dormitory, shared flat, or private flat), perceived parental support for one's studies (insufficient, good, or very good), weekly hours spent on studying, number of failed subjects (none, one, two, or more), and years of study first (foundation), second, third, fourth, fifth, or sixth). The second section assesses the level of burnout during COVID-19 among healthcare students by using Burn-out Clinical Subtypes Questionnaire-Student Survey (BCSQ-12-SS) which consists of twelve questions; Q1-Q4 deal with overload, Q5-Q8 deal with lack of development, and Q9-Q12 deal with neglect. Likert scale was used as 1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, and 5 = strongly agree. The language of the questionnaire was English. Data was entered in excel sheet and then an analysis was done using SPSS software for mac v23.

Note: Data collection sheet (questionnaire) is attached in appendix.

Outcome assessment

Primary outcome

An evaluation of the prevalence of burnout among healthcare students during the coronavirus disease-2019 (COVID-19) pandemic in Makkah city, Saudi Arabia.

Secondary outcome

- An evaluation of burnout levels between different colleges.
- An investigation of the association between burnout and socio-demographic variables.

The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

04

Data collection and management

Data was collected from participants who met the criteria. Electronic data collection forms do not show any nominative information. Participants were identified by serial study code and initials. Three different persons performed data entry. After verification, data was transferred to the statistical database directly.

Statistical analysis plan

Different statistical procedures were used in this study. For the sociodemographic data, frequencies and percentages were used. Furthermore, means and standard deviations were used as measures for the descriptive statistics of the participants' burnout. Backward regression analysis was also calculated to evaluate the predictors of burnout scores. Finally, prevalence of burnout according to college and gender was given in frequencies and percentages as well as the p-value.

Ethical part and confidentiality

The research proposal was submitted to institutional reviewing board at UQU. No study activities had been started until the IRB approval was obtained.

Publication

The main credit in publication will go to the principal investigator and co-investigators. Those who will contribute less substantially to data collection and analysis will have an acknowledgement in the manuscript.

Attachments

- Data collection form.
- Informed consent form.

Results

Overview

The current study investigated the prevalence of burnout among healthcare students during COVID-19 pandemic in Makkah city using the Burnout Clinical Subtypes Questionnaire-Student Survey (BCSQ-12-SS). The questionnaire is divided into 3 main dimensions, the first one is the overload dimension (Q1 to Q4), the second one is lack of development (Q5 to Q8) and the third one is neglect (Q9 to Q12). 517 healthcare students answered the questionnaire.

This section consists of five Parts, the first one contains the distribution of the sociodemographic data (i.e. age, gender, family support, weekly studying hours) given in frequencies and percentages. The second part contains some descriptive statistics of the burnout questionnaire. Data in this part are given in frequencies and percentages as well as each question's mean and standard deviation. The impact of sociodemographic characteristics on burnout scores is given in means and standard deviations as well as the p-value in the third part of this section. For the p-value, if it is 0.05 or lower, the result was considered as significant, but if it is higher than 0.05, the result was regarded as non-significant. Furthermore, Backward regression analysis was calculated to evaluate the predictors of burnout scores in the fourth part of this section. Finally, prevalence of burnout according to college and gender was given in the fifth part of this section. Data in this regard are given in frequencies and percentages as well as the p-value.

Sociodemographic results

The data presented in table 1 as count (n) and percent (%) including college, Marital status, weekly studying hours, place of residence, age, gender, family support, weekly studying hours, failed subjects, and the year of study. As it indicates, the vast majority (66%) of the

The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

05

participants were females, compared to 34% males. The age distribution of the participants indicated that most of them were from 20 years old to 22 years old (61.3%), while only 1.2% of the participants were older than 26 years old. As to their majors, 41.8% of the participants studied dentistry, followed by 19.5% who were studying applied medical science. Most of the participants were in their 2nd year of college (26.3%) followed by those who study in the 4th year (22.6%). The time spent by the participants on studying was less than 30 hours a week (53.6%) compared to 11.8% of the participants who are studying for more than 40 hours a week. Moreover, 92.3% of the participants indicated that they have never failed a subject at college. Additionally, 94% of the sample indicated that they live with their parents, while 82.6% said that they receive family support, compared to 17.4% who do not. However, more than half of the participants (60%) said that they are on a scholarship, while 40% are not. Finally, the vast majority of the participants were singles (95.9%) while only 2 participants were either widowed or divorced.

Variables		n	%	Variables		n	%
College	Dentistry	216	41.8%	Gender	Male	176	34.0%
	Medicine	54	10.4%				
	AMS	101	19.5%				
	Nursing	47	9.1%		Female	341	66.0%
	Pharmacy	67	13.0%				
	Other	32	6.2%				
Marital status	Single	496	95.9%	Family support	Yes	427	82.6%
	Married	19	3.7%		No		
	Divorced	1	0.2%			90	17.4%
	Widowed	1	0.2%				
Weekly studying hours (hrs)	< 30	277	53.6%	Year	1st year (Foundation)	7	1.4%
	30 - 40	179	34.6%		2nd year	136	26.3%
					3rd year	115	22.2%
					4th year	117	22.6%
	➤ 40	61	11.8%		5th year	76	14.7%
					6th year	51	9.9%
					Other	15	2.9%
Place of residency	With parents	486	94.0%	Scholarship	Yes	310	60.0%
	Dorms	8	1.5%		No	115	22.2%
	Flat	20	3.9%				
	Shared	3	0.6%		Not applicable	92	17.8%
Age	< 19	39	7.5%	Failed subjects	None		92.3%
	20 - 22	317	61.3%		One		5.4%
	23 - 25	155	30.0%		Two or more		2.3%
	> 25	6	1.2%				

***Table 1:** Sociodemographic data of the participants (n = 517) given in counts (n) and percentages (%).*

The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

06

Descriptive statistics of the participants' burnout

In table 2, descriptive statistics for the survey questions are reported as counts (n) and percentages (%) for a 1-5 Likert scale, as well as means ± SD. The most prominent result of these data is that when the students were asked about whether they "would like to study something else that would be more challenging to my abilities" most of them (31.1%) strongly disagreed with this sentence compared to only 5.8% who strongly agreed with a mean of 2.36 ± 1.21. However, for the statement "My studies do not provide me with opportunities to develop my abilities" 129 participants (25%) strongly disagreed with this sentence while only 9.1% of the total sample strongly agreed with the given sentence with a mean of 2.52 ± 1.26. Moreover, the students highly disagreed (24.2%) in contrast to only 9.5% who strongly agreed when they were asked "feel that my current studies are restraining the development of my abilities". Furthermore, the total burnout score (average of the three aforementioned factors) was 2.80 ± 0.62 showing that most healthcare students are uncertain.

Questions	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)	Mean ± SD
1- In my commitments to my study, I think I work harder than it's healthy	69 (13.3%)	111 (21.5%)	125 (24.2%)	140 (27.1%)	72 (13.9%)	2.93 ± 1.25
2- I would like to study something else that would be more challenging to my abilities	30 (5.8%)	67 (13%)	126 (24.4)	133 (25.7%)	161 (31.1%)	2.36 ± 1.21
3- When the results of my studies are not good at all, I stop making an effort	79 (15.3%)	126 (24.4%)	118 (22.8%)	92 (17.8%)	102 (19.7%)	2.97 ± 1.35
4- I neglect my personal life to achieve great objectives in studying	88 (17.0%)	120 (23.2%)	151 (29.2%)	105 (20.3%)	53 (10.3%)	3.16 ± 1.22
5- I feel that my current studies are restraining the development of my abilities	49 (9.5%)	64 (12.4%)	117 (22.6%)	162 (31.3%)	125 (24.2%)	2.51 ± 1.24
6- I give up in response to an obstacle in my studies	71 (13.7%)	127 (24.6%)	116 (22.4%)	116 (22.4%)	87 (16.8%)	2.95 ± 1.3
7- I am endangering my health to achieve good results in my studies	101 (19.5%)	134 (25.9%)	124 (24.0%)	98 (19.0%)	60 (11.6%)	3.22 ± 1.28
8- I would like to study something else in which I could better develop my talent	39 (7.5%)	58 (11.2%)	122 (23.6%)	151 (29.2%)	147 (28.4%)	2.40 ± 1.22
9- I give up when I face any difficulty in my tasks as a student	56 (10.8%)	136 (26.3%)	117 (22.6%)	108 (20.9%)	100 (19.4%)	2.88 ± 1.29
10- I ignore my own needs to satisfy the requirements of my studies	73 (14.1%)	100 (19.3%)	145 (28.0%)	143 (27.7%)	55 (10.6%)	2.98 ± 1.21
11- My studies do not provide me with opportunities to develop my abilities	47 (9.1%)	79 (15.3%)	102 (19.7%)	158 (30.6%)	129 (25.0%)	2.52 ± 1.26
12- When the effort invested in studying is not enough, I give up	10 (1.9%)	10 (1.9%)	15 (2.9%)	17 (3.30%)	30 (5.8%)	2.42 ± 1.40
Total burnout						2.80 ± 0.62

***Table 2:** Descriptive statistics of questions used in the survey (n=517) in counts (n) and percentages (%).*

Effect of socio-demographic factors on burnout scores of dental students

The effect of socio-demographic variables on burnout scores is presented in table 3. As it indicates, none of the socio-demographic characteristics had a significant impact on burnout scores, Except for year of study, gender, and college ($p < 0.05$).

Variables	n	Overload		Lack of development		Neglect		Total burnout score	
		Mean ± SD	p-value	Mean ± SD	p-value	Mean ± SD	p-value	Mean ± SD	p-value
Gender									
Female	341	3.30 ± 1.43	0.01*	3.46 ± 1.18	0.29	3.03 ± 1.48	0.91	2.73 ± 0.66	0.0002*
Male	176	2.97 ± 1.55		3.34 ± 1.44		3.01 ± 1.55		2.94 ± 0.49	
Age									
≤ 19	39	3.23 ± 1.51		3.82 ± 1.02		2.69 ± 1.45		2.71 ± 0.59	
20 - 22	317	3.15 ± 1.46	0.67	3.40 ± 1.28	0.05*	3.06 ± 1.48	0.40	2.79 ± 0.64	0.37
23 - 25	155	3.23 ± 1.50		3.32 ± 1.32		3.05 ± 1.55		2.86 ± 0.59	
> 25	6	3.83 ± 1.47		4.33 ± 0.51		2.5 ± 1.76		2.56 ± 0.46	
College									
Dentistry	216	3.32 ± 1.51		3.49 ± 1.34		2.95 ± 1.54		2.89 ± 0.55	
Medicine	54	3.29 ± 1.35		3.33 ± 1.22		3.20 ± 1.57		2.73 ± 0.69	
Nursing	47	2.97 ± 1.49	0.001*	3.48 ± 1.24	0.83	3.06 ± 1.53	0.84	2.60 ± 0.58	0.013*
Pharmacy	67	2.79 ± 1.46		3.28 ± 1.34		2.95 ± 1.41		2.85 ± 0.73	
AMS	32	2.94 ± 1.46		3.36 ± 1.18		3.13 ± 1.48		2.78 ± 0.63	
Others	101	4.03 ± 1.12		3.4 ± 1.10		2.96 ± 1.46		2.58 ± .61	
Marital status									
Married	19	3.31 ± 1.56		2.89 ± 1.41		2.94 ± 1.58		2.89 ± 0.74	
Single	496	3.18 ± 1.48	2.82	3.44 ± 1.27	0.10	3.03 ± 1.50	0.97	2.80 ± 0.61	0.77
Others	2	4.5 ± 0.70		2.5 ± .707		3 ± 2.82		2.94 ± 0.43	
Year of study									
1st year	7	4.42 ± 1.51		3.71 ± 1.25		3.42 ± 1.81		2.66 ± 0.26	
2nd year	136	3.06 ± 1.44		3.41 ± 1.11		3.08 ± 1.43		2.73 ± 0.56	
3rd year	115	3.12 ± 1.51		3.41 ± 1.38		3.10 ± 1.50		2.87 ± 0.66	
4th year	117	3.00 ± 1.47	0.02*	3.33 ± 1.37	0.68	3.12 ± 1.50	0.54	2.70 ± 0.65	0.02*
5th year	76	3.31 ± 1.41		3.38 ± 1.31		2.75 ± 1.61		2.99 ± 0 .65	
6th year	51	3.60 ± 1.55		3.54 ± 1.18		2.90 ± 1.61		2.85 ± 0.54	
Intern	15	3.66 ± 1.34		3.93 ± 1.16		2.73 ± 1.22		2.71 ± 0.58	

Weekly study: hours									
< 30	277	3.27 ± 1.42		3.48 ± 1.24		3.02 ± 1.51		2.80 ± 0.64	
30 - 40	179	3.18 ± 1.54	0.11	3.30 ± 1.36	0.32	2.98 ± 1.49	0.67	2.79 ± 0.60	0.82
> 40	61	2.83 ± 1.50		3.47 ± 1.17		3.18 ± 1.54		2.85 ± 0.58	
Residency									
Parents	486	3.18 ± 1.48		3.42 ± 1.28		3.03 ± 1.51		2.80 ± 0.62	
Dorms	8	4.12 ± 0.99	0.12	3.5 ± 1.19	0.49	3.12 ± 1.24	0.74	2.63 ± 0.61	0.75
Flat	20	2.9 ± 1.55		3.55 ± 1.09		2.75 ± 1.40		2.84 ± 0.68	
Shared	3	4.33 ± 0 .57		2.33 ± 1.52		3.66 ± 2.30		3.06 ± 0.58	
Failed subject									
None	477	3.19 ± 1.48		3.41 ± 1.26		3.05 ± 1.51		2.80 ± 0.61	
One	28	3.25 ± 1.35	0.57	3.35 ± 1.56	0.51	2.67 ± 1.44	0.40	2.93 ± 0.59	0.12
Two or more	12	2.75 ± 1.65		3.83 ± 1.19		2.83 ± 1.52		2.49 ± 0 .72	
Family support									
Very good	176	3.18 ± 1.47		3.30 ± 1.35		2.89 ± 1.42		2.88 ± 0.69	
Good	247	3.28 ± 1.52	0.18	3.46 ± 1.23	0.29	3.08 ± 1.53	0.36	2.75 ± 0.57	0.102
Insufficient	94	2.95 ± 1.35		3.53 ± 1.22		3.12 ± 1.58		2.80 ± .58	

***Table 3:** Effect of sociodemographic variables on the participants' burnout (n = 517) in counts (n).*

Regarding gender, female students showed a significantly higher level of agreement on overload questions as compared with male. Regarding college, dental students showed a significant higher level of agreement on total burnout score as compared to other students in different colleges. Regarding year of study, 5th, 3rd and 6th year students showed a significantly higher level of agreement on total burnout score as compared to other students.

Backward regression analysis

Backward regression analysis was conducted to evaluate the predictors of burnout scores as illustrated in table 4. From the results of regression analysis, it can be noticed that the gender was a significant predictor of overload, while age was a significant predictor of lack of development scores. Furthermore Age, college and family support were significant predictors for total burnout score. There were no significant predictors regarding neglect.

Prevalence of burnout

Table 5 indicated the prevalence of burnout among the participants based on their majors. As it shows, the prevalence showed a high percentage (22.2%) among the dentistry students, while only 4 students who were studying nursing showed some levels of burnout (8.5%). However, the total percentage of prevalence here was 19.7% for all the participants. The results also showed that there are no differences between different colleges in prevalence of burnout.

The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

09

Variable	Predictor	Coefficient	SE	p-value
Overload	Gender	-0.37	0.13	0.007*
	Weekly study hours	0.14	0.10	0.15
	Year of study	0.05	0.03	0.12
Lack of development	Age	-0.21	0.09	0.01*
Neglect	Non-significant factors			
Total burnout score	Age	0.08	0.04	0.05*
	College	-.03	0.01	0.03*
	Family support	0.06	0.03	0.047*

***Table 4:** Backward linear regression.*

Variable	Normal n (%)	Burnout n (%)	Total n (%)	p-value
Dentistry	188 (77.8%)	48 (22.2%)	216 (100%)	
Medicine	46 (85.2%)	8 (14.8%)	54 (100%)	
AMS	83 (82.2%)	18 (17.8%)	101 (100%)	
Nursing	43 (91.5%)	4 (8.5%)	47 (100%)	0.051
Pharmacy	47 (70.1%)	20 (29.9%)	67 (100%)	
Other	28 (87.5%)	4 (12.5%)	32 (100%)	
Total	415 (80.3%)	102 (19.7%)	517 (100%)	

***Table 5:** Prevalence of burnout according to college (n = 517) in counts (n) and percentage (%).*

Regarding the prevalence of burnout among the participants based on their gender, table 6 indicates that females (25%) showed a higher percentage of burnout than males (17%). The results showed that there are statistically differences between the two genders in prevalence of burnout (p < 0.05).

Gender	Normal n (%)	Burnout n (%)	Total n (%)	p-value
Female	132 (75%)	44 (25%)	174 (100%)	
Male	283 (83%)	58 (17%)	341 (100%)	0.03*
Total	415 (80.3)	102 (19.7%)	517 (100%)	

***Table 6:** Prevalence of burnout according to gender (n = 517) in counts (n) and percentage (%).*

Discussion

This study investigated the prevalence of burnout among healthcare students in Makkah city, Saudi Arabia during the COVID-19 pandemic. A number of 517 participants were included in this study, in which the majority of the students (66%) were females, while 34% of the students were males. The age distribution of the participants showed that the vast majority of the students were from 20 years old to 22 years old (61.3%), followed by 19.5% who were studying applied medical science.

The Prevalence of Burnout among Healthcare Students during COVID-19 Pandemic in Makkah City: A Cross-Sectional Study

10

This study found out that in terms of sociodemographic data of the students, there is only a statistically significant results with the year of study, gender, and college (p < 0.5), which contradicts the finding of Al-Rawi., *et al*. [1] who indicated that there was a significant association between burnout and receiving a scholarship and family support. In general, this study comes in line with the finding of Al-Rawi., *et al*. [1] for the rest of the sociodemographic variables as there was no statistically significant variations in the relation between burnout and some sociodemographic characteristics (i.e. Marital status, family support, failed subjects).

Furthermore, a study conducted by Silistraru., *et al*. [5] indicated that females were found to be strongly associated with higher stress levels, which comes in line with the present study, as it shows that females have higher scores of burnout (p = < 0.05). Additionally, the current study revealed that female students showed a significantly higher level of agreement on overload questions as compared with male. Female students (25%) also showed a higher percentage of burnout than males (17%).

This study also found out that 5th, 3rd and 6th year students showed a significantly higher level of agreement on total burnout score as compared to other students. In comparison with the findings of Zis., *et al*. [9], he said that the burnout prevalence dropped significantly during COVID-19 in year 4 (16.7%, p = 0.011), whereas it increased significantly in year 6 (19 50%, p = 0.01).

Some studies showed a higher percentage of prevalence of burnout due to COVID-19, which slightly disagrees with the finding of this study. In the current study the total percentage of prevalence of medical students' burnout was 19.7% for all the participants, while Silistraru., *et al*. [5] reported that 36.5% of the medical students in the sample (46) experienced burnout, which might be attributed to the smaller sample size.

Finally, as a comparison of the results of regression analysis between the current study and Al-Rawi., *et al*. [1], he found out that weekly studying hours were a significant predictor of overload, while the gender was a significant predictor of overload in this study. Al-Rawi., *et al*. [1] also found that scholarship was a significant predictor of neglect scores while in this study, there were no significant predictors for neglect. Moreover, Al-Rawi., *et al*. [1] also indicated that there were no significant predictors regarding lack of development or total burnout while in the current study, age was a significant predictor of lack of development scores. Furthermore, Age, college and family support were significant predictors for total burnout score.

Conclusion and Recommendations

To sum up, this study explored the prevalence of burnout among healthcare students during COVID-19 pandemic in Makkah city, Saudi Arabia. Based on the findings of this study, female medical students have a higher percentage of burnout than males. As to the students major, dentistry students are at a bigger risk of burnout than their peers. All in all, the total percentage of prevalence of medical students' burnout cannot be overlooked, hence, a specific intervention based on the extent of burnout must be done to assist students in maintaining their mental health, which has the potential to reduce study obstacles. This study also recommends that further studies should be done to investigate this matter in different universities in Saudi Arabia.

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Volume 22 Issue 8 August 2023