

ORIGINAL ARTICLE

Post COVID-19 Pandemic Generalized Anxiety Status of Health Professional undergraduate studentsRIZWANA KAMRAN¹, SHAZIA TUFAIL², HINA ZAFAR RAJA³, REHAN UDDIN ALVI⁴, AQSA SHAFIQUE⁵, MUHAMMAD NASIR SALEEM⁶, WAQAS SAMI⁷, ASAD MAHMOOD⁸¹Assistant Professor, School of Health Professions' Education and Post graduate Studies, CMH Lahore Medical College & Institute of Dentistry, NUMS Rawalpindi, Pakistan²Associate Professor, Department of Gynecology and Obstetrics, CMH Lahore Medical College & Institute of Dentistry,³Professor of Prosthodontics, CMH Lahore Medical College & Institute of Dentistry, Lahore, NUMS Rawalpindi, Pakistan⁴Professor & Head of Department Dermatology & Director FDP, CMH Lahore Medical College & Institute of Dentistry, Lahore,⁵CMH Lahore Medical College and Institute of Dentistry, MSPH Student 2021-2023 at Health Services Academy⁶Professor & Head of Department of Operative Dentistry, CMH Lahore Medical College & Institute of Dentistry,⁷Faculty of Biostatistics, Department of Community Medicine and Public Health, College of Medicine, College of Medicine, Majmaah University, Kingdom of Saudi Arabia⁸Associate Professor of Oral Biology, Lahore Medical and Dental College, LahoreCorrespondence to Dr. Rizwana Kamran, Email: rizwana_kamran@hotmail.com**ABSTRACT****Aim:** To assess the psychological impact of COVID-19 on mental status of undergraduate medical students, after reopening of educational institutions.**Methods:** This descriptive, online cross-sectional study was conducted on medical students of Combined Military Hospital Lahore Medical College & Institute of Dentistry, Lahore Pakistan for 6 months from 1st June to 30th November, 2021. Generalized Anxiety Disorder Scale (GAD-7) was used as the study tool. Data was analyzed by using statistical software SPSS - 23. Frequencies and percentages were used for descriptive variables. A univariate analysis was utilized to identify the noticeable associations between traits of sample and the anxiety level in current scenario of COVID-19 pandemic. Finally multivariate logistic regression analyses, odds ratio (OR), and Spearman's correlation coefficient, *r*, was used to evaluate the association between COVID-19-related stressors and anxiety level.**Results:** Of the 324 respondents, majority were females residing in urban areas with their parents. Severe anxiety was experienced by 23.8% of students. Female respondents were found to have more anxiety as compared to males (OR = 1.81; 95% CI = 1.173 – 2.815). Moreover, respondents having a relative or an acquaintance infected with COVID-19 reported to have more anxiety (OR = 3.007, 95% CI = 2.377 - 3.804).**Conclusion:** A significant number of students are experiencing anxiety in the post COVID-19 phase, especially those that had an acquaintance infected with COVID-19. There is a need to look after student's mental health and to implement appropriate psychological strategies and interventions to deal with this level of psychological distress in the students at this phase of pandemic for optimum training of future health professionals.**Keywords:** Anxiety, COVID-19, healthcare professionals, mental health, medical students, pandemic**INTRODUCTION**

The outbreak of novel coronavirus COVID-19 is one of the biggest worldwide challenge¹. COVID-19 pandemic ranked ninth amongst the top 10 deadliest pandemics with over 290 million cases and 5.44 million deaths worldwide². The first case was identified in Pakistan on 26th February, 2020 leading to 1,295,933 confirmed cases, 10,184 active cases, and 28,933 deaths till 3rd January, 2022³. The country attempted to control the spread of disease by prompt testing and treating patients, social distancing, travel restrictions, quarantine protocols, and vaccinations.

COVID-19 has affected quality of life leading to continuous stress, anxiety and other mental health disorders in all genders and diverse age groups⁴. Generally, university students practice active social behaviors. Despite this, they are at a greater risk of developing mental health problems than the general population due to their high level of anxiety, abnormal dietary habits, and increased use of drug abuse⁵. Likewise, under graduate medical students (UGMS) undergo stress due to cognitive overload, lack of adequate rest and sleep and fear of insufficient training due to limited clinical exposure. In addition, during COVID-19 pandemic closure of educational institutions led to added factors of increased mental stress⁶. Studies depicted increased levels of mental stress and anxiety, globally, owing to changed course curriculum, home isolation, fear of safety, technological challenges and concerns about the future. Studies reflect increase in mental stress, from 68% in Australia to 87% in Pakistan to 91% in United States^{7,8}.

Received on 11-07-2022

Accepted on 22-11-2022

Educational institutions reopened in March 2021 as 72.1 million people were fully vaccinated in post Covid-19 anxiety may have its influence over all members of society.

Therefore, the purpose of this study was to explore the psychological impact of COVID-19 on mental status of UGMS during the pandemic after reopening of educational institutions. The results of the present study might help in devising psychological interventions for UGMS and in developing new health policies for training of health professionals.

METHODOLOGY

This cross-sectional descriptive study was carried out in Combined Military Hospital Lahore Medical College & Institute of Dentistry (CMH LMC& IOD) for 6 months from 1st June to 30th November, 2021. Health care students of all academic years studying in CMH LMC& IOD were included in the study, while those who refused to take part in study or did not submit their Google forms were excluded. Non-probability convenience sampling technique was used. Sample size of 255 students was calculated by OpenEpi Version 3, open source sample size calculator keeping the confidence interval 95% with a power of 80%, however 324 students participated in the study. Generalized Anxiety Disorder Scale (GAD-7) was used to analyze the anxiety state of study participants⁹. After getting approval from Institutional Review Board of CMH LMC, questionnaire link was shared through email. Informed consent was obtained from the participants. The questionnaires were anonymous to ensure the confidentiality and reliability of data. The questionnaires comprised of demographic details of the respondents (gender, age, academic year, living with parents, urban/rural residence and relative or an acquaintance

infected with COVID-19) and GAD 7. The GAD-7 consisted of seven items based on seven core symptoms and inquired the frequency with which respondents suffered from these symptoms within the last two weeks. Respondents reported their symptoms using a 4-item Likert rating scale ranging from 0 (not at all), 1 (several days), 2 (more than half the days) to 3 (nearly every day), such that the total score ranged from 0 to 21. Scores of 5, 10, and 15 were considered as the cut-off points for mild, moderate and severe anxiety, respectively. Data was analyzed by using statistical software SPSS - 23. Frequencies and percentages were used for descriptive variables. A univariate analysis was utilized to identify the noticeable associations between traits of sample and the anxiety level in current scenario of COVID-19 pandemic. Statistically significant variables were screened and included in multivariate logistic regression analyses. The estimates of the strengths of associations were demonstrated by the odds ratio (OR) with 95% confidence interval (CI). Spearman's correlation coefficient, r , was used to evaluate the association between COVID-19-related stressors and anxiety level. A p -value ≤ 0.05 was considered as significant.

RESULTS

Three hundred and twenty four students participated in the study with the response rate of 44.7%. Of the respondents, 223 were females and 101 were males. Out of the females, 87% lived with parents and 13% lived without parents whereas 85.1% of the males lived with parents and 14.9% lived without parents. Majority (301) lived in urban areas whilst only 22 resided in rural area. An enthusiastic response was received from females of second, first and final year with responses given by 59, 56 and 54 students respectively, followed by 36 responses from third year females and only half the response (18) from fourth year female students.

The male responses have been relatively short of a target set by females, yet first and second year managed to give 39 and 25 responses respectively. Others gave responses as meager as 13 from each final and third year and 11 from fourth year. 223 students reported contraction of COVID-19 infection, among their

close acquaintances, while 101 students (51 females and 36 males) reported no such infection existed among their close family, friends or relatives (Table 1).

Table-1: Demographic characteristics of participants in the study (n=324)

Variables	Female n(%)	Male n(%)	Total n(%)
Gender	223(68.8)	101(31.2)	324(100)
Living with parents			
Yes	194(87)	86(85.1)	280(86.4)
No	29(13)	15(14.9)	44(13.5)
Place of residence			
Urban	211(94.6)	90(89.1)	301(67.8)
Rural	12(5.4)	11(10.9)	23(32.1)
Academic year			
1 st year	56(25.1)	41(40.6)	97(29.9)
2 nd year	59(26.5)	26(25.7)	85(26.2)
3 rd year	36(16.1)	13(12.9)	49(15.1)
4 th year	18(8.1)	12(11.9)	30(9.4)
5 th year	54(24.2)	9(8.9)	63(19.4)
Any Relative or an Acquaintance infected with COVID-19			
Yes	172(76.7)	65(64.4)	223(100)
No	51(22.9)	36(35.6)	101(100)

Present study showed various levels of anxiety due to COVID-19 pandemic among UGMS in CMH LMC (Table 2). Of the total 324 valid responses, 77 students experienced severe anxiety with 67 students experiencing moderate anxiety due to COVID-19 pandemic. More than half of students were going through mild or minimal anxiety.

Table-2: Level of Anxiety due to COVID-19

Level of Anxiety	n(%)
Minimal	80(24.7)
Mild	100(30.9)
Moderate	67(20.7)
Severe	77(23.8)
Total	324(100)

Table 3: Univariate analysis of UGMS' Anxiety due to COVID 19 during lockdown

Variables	Total	Normal n (%)	Mild Anxietyn (%)	Moderate Anxiety n (%)	Severe Anxiety n (%)	p-value	
Gender	Male	101	35 (34.7)	35 (34.7)	8 (7.9)	23 (22.8)	<0.001*
	Female	223	45 (20.2)	65 (29.1)	59 (26.5)	54 (24.2)	
	Total	324	80	100	67	77	
Living with parents	Yes	280	70 (25.0)	93 (33.2)	53 (18.9)	64 (22.9)	0.057
	No	44	10 (22.7)	7 (15.9)	14 (31.8)	13 (29.5)	
	Total	324	80	100	67	77	
Place of residence	Rural	22	5 (22.7)	9 (40.9)	1 (4.5)	7 (31.8)	0.219
	Urban	302	75 (24.8)	91 (30.1)	66 (21.9)	70 (23.2)	
	Total	324	80	100	67	77	
Relative or an acquaintance infected with COVID-19	Yes	237	46 (19.4)	80 (33.8)	54 (22.8)	57 (24.1)	0.003*
	No	87	34 (39.1)	20 (23.0)	13 (14.9)	20 (23.0)	
	Total	324	80	100	67	77	
Academic year	First year	97	26 (26.8)	27 (27.8)	19 (19.6)	25 (25.8)	0.424
	2 nd year	85	24 (28.2)	23 (27.1)	21 (24.7)	17 (20.0)	
	3 rd year	49	12 (24.5)	14 (28.6)	6 (12.2)	17 (34.7)	
	4 th year	30	5 (16.7)	11 (36.7)	9 (30.0)	5 (16.7)	
	Final year	63	13 (20.6)	25 (39.7)	12 (19.0)	13 (20.6)	
	Total	324	80	100	67	77	

Table 4 Ordinal logistic regression analysis of elements affecting UGMS' anxiety

Variables	Number	B	SE	OR	p-value	OR (95%CI)	
Gender	Female	223	0.597	0.223	1.81	0.007*	1.173 – 2.815
	Male	101	---	---	---	---	---
Relative or an acquaintance infected with COVID-19	Yes	237	0.493	0.235	1.63	0.036*	1.031 – 2.601
	No	87	---	---	---	---	---

B; Beta, SE; Std. Error, OR; Odds ratio, CI; Confidence interval, a reference groups

Results of ordinal logistic regression are presented in Table 4; the significant variables from table 3 were included in this analysis. The model chi-square was significant with $p=0.002$. The good fit was also indicated by conducting the parallel lines analysis with $p>0.05$. Female respondents were found to have more anxiety as compared to males (OR=1.81; 95% CI=1.173– 2.815). Moreover, respondents having a relative or an acquaintance infected with COVID-19 reported to have more anxiety (OR=3.007, 95% CI=2.377 - 3.804).

DISCUSSION

A cross sectional descriptive study was carried out to analyze the psychological impact of COVID-19 pandemic on undergraduate medical students. A total of 324 students participated in the study. Generalized Anxiety Disorder Scale (GAD-7) was used as a research tool to analyze the anxiety state. It is one of the most widely used instruments with remarkable internal consistency for the detection and screening of anxiety disorders⁹. It is a self-reporting valid scale with satisfactory psychometric properties¹⁰.

Psychological intervention is generally required during pandemics to fulfill mental health needs of affected individuals¹¹. Moderate to high stress levels were reported in dental graduates from various institutes across Pakistan during COVID-19 pandemics⁹. Mental health issues may be addressed after control of emergency situations to reduce negative effects on society.

Distribution of students living with and without parents was almost similar for both genders. Females students as well as students living in urban of all academic years responded well to the study. This finding is consistent with the results of reported in another study within Pakistan which despite the lesser number of female participants, the response of females (99%) was much higher than males (68.7%)¹².

223(68.8%) participants reported about the presence of COVID-19 affected relative/s in the family. Among these, majority were living with their families. The proximity of living with a Covid-19 affected individual may aggravate the anxiety status of study participants, as depicted in another study, reporting aggravated stress and domestic violence, specially targeted towards female family members¹³. Present study showed that anxiety was present at variable intensity in undergraduate medical students, with minimal anxiety reported in only (24.7%) participants. Presence of anxiety alone is an alarming factor, as it leads to stress response within body affecting multiple organs. The result are consistent with another local study depicting moderate to high perceived stress levels of undergraduate dental students from all provinces of Pakistan, thus leading to emotional, physical, cognitive and psychological symptoms⁸. In the pre-covid era, similar findings were reported in other studies^{14,15}, however, few studies reported absence of stress in undergraduate medical students¹⁶. Thus COVID-19 pandemic may have a significant but variable effect in the lives of individuals.

There is a significant difference in anxiety levels in between males and females, with p value of <0.001 , in the present study. This difference is in concordance with results of other studies from all parts of world¹⁷, where females report increased stress and anxiety levels^{18,8}, possibly owing to fluctuations in ovarian hormone levels¹⁹. Generally females show hypersensitivity to aversive stimuli leading to activation of neural responses as fear, anxiety or mood changes. COVID-19 pandemic resulted in physical, social, economical and mental compromises at all levels of society, jeopardizing the quality of lives. Persistent stress may lead depression reduced cognitive skills of students and poor academic performances²⁰.

The limitations of this study was to broaden the horizon of target population. This will improve the generalizability of results and help in improvement of educational policies. It is therefore recommended that due to the prevalent global calamity, health professional education can adopt stress management techniques

e.g. critical thinking skills²¹, yoga²², DEAL model (detection, evaluation, assessing and self-reflection of stressor)²³ etc. to improve the learning capabilities and improve the psychological health status of undergraduate students. Modification of institutional policies to provide instrumental and emotional support to undergraduate students may help them to overcome this difficulty²⁴.

CONCLUSION

There is a dire need to look after student's mental health and to implement appropriate psychological strategies. This can help in achieving the learning outcomes of health professional education during critical scenarios.

Conflict of interest: The authors have no conflict of interest

Acknowledgements: We wish to thank all participants who sent their responses and the reviewers for their constructive feedback.

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