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Breaking the stigma: Determining factors affecting the mental health of students after COVID-19 pandemic

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ABSTRACT

Introduction: Pandemics and other public health crises have impacted the lives of millions of individuals worldwide, affecting their mental well-being in various ways. During such crises, young adults and professionals are particularly vulnerable to mental health challenges. This study's main objective was to destigmatize mental illness and assess the burden of stress, anxiety, depression, and suicidal behavior among medical and dental students. Additionally, the study aimed at coping strategies for both individuals with psychiatric illnesses and those without. **Method:** This cross-sectional study aimed to assess depression and poor mental health symptoms among university students at Liaquat University of Medical & Health Sciences in Jamshoro, Pakistan. Purposive sampling was employed to promote honest reporting by the students, and strict anonymity was ensured throughout the study. Data collection occurred in the final quarter of 2022. **Results:** The results from this study show that females, students aged 18-25, and single students faced higher risks of mental health issues. Undergraduate students and middle-class students were also more affected. Logistic regression analysis indicated that marital status, socioeconomic status, and living in urban or rural areas without family support were significant predictors of mental health problems among students. **Conclusions:** Students' mental health has been notably impacted by the COVID-19 pandemic. Researchers should consider social impacts on mental health. Urgent actions should include the implementation of telemedicine and the establishment of counseling units staffed by qualified experts. Policymakers need to adopt a holistic approach that integrates mental health support when planning for future epidemics.

Keywords: Anxiety, Depression, Suicidal thoughts, Mental Health, Pandemic

1. INTRODUCTION

The COVID-19 pandemic has resulted in mental health problems among the general public and healthcare professionals. For example, it has led to

people's anxiety and mental health-related stresses (Zhou et al., 2020). Worldwide, nearly 800,000 people commit suicide each year. Severe acute respiratory syndrome corona virus-2 (SARS-CoV-2) has caused the new corona virus disease (COVID-19), which is the cause of death of millions of people worldwide and has become the biggest challenge for public health services (Riyyan et al., 2022). Studies carried out at medical schools revealed that medical and dental students experience more mental anguish than the rest of the population. Medical students are commonly reported to have other mental health issues as well. Another key issue that is regularly addressed in the realm of medical education is burnout. Several factors, such as high academic pressure, proximity to suffering patients, limited social connections, family difficulties, inadequate sleep, and challenging romantic relationships, can significantly impact the mental well-being of this population (Capdevila-Gaudens et al., 2021).

Medical students exhibit significantly higher rates of depression and anxiety disorders compared to the general population, yet they are less inclined to seek help. Studies focusing on student mental health explore various aspects, with stress, well-being, and depression risk being key areas of emphasis. Among these factors, stress has garnered substantial scientific attention, with university students experiencing considerable tension while pursuing their studies (Bastemeyer and Kleinert, 2021). Students frequently assert that their mental health challenges profoundly impact both their academic and personal growth. Across many countries worldwide, numerous studies have highlighted a notable prevalence of psychological distress, encompassing depression, anxiety, and stress, among students pursuing health professions. Understanding the root causes of depression, anxiety, and stress proves invaluable in managing and providing mental health support for students (Nayak and Sahu, 2022).

Amid the increasing occurrence of mental health problem diagnoses and symptom reports, the demand for mental health services among college-aged students is steadily on the rise (Casey et al., 2022). Students who enrol in college undergo a significant life change from adolescence to maturity. Many students face enormous strain during this critical period, which is mainly brought on by monetary stress, scholastic difficulties, lifestyle considerations, and interpersonal interactions. According to studies, college students have more mental health issues than those in their age group who do not attend college, and as a result, mental illnesses, including melancholy, anxiety, and stress, are more common (Zeng et al., 2019). The university environment subjects students to intense mental pressure, giving rise to various mental health conditions, though this aspect remains relatively unexplored in research (Cheung et al., 2020).

A similar study was carried out in which final-year medical students were not included in the study as a high nonparticipation rate and an unnaturally high degree of anxiety were anticipated due to their upcoming examinations (Arun et al., 2022). This assertion suggests that the issue is substantial, particularly concerning university students at higher risk of facing mental health challenges (Islam et al., 2022). Various socio-demographic characteristics Natarajan, (2020), including age, gender, exam demands, dissatisfaction, and incessant test schedules, have been associated with stress, anxiety, and depression, particularly among medical students, according to research conducted in Pakistan (Saeed et al., 2018). Anxiety and depression in young individuals are substantial public health concerns, causing immense human suffering (Adewuya et al., 2006).

However, the problem grows more worrisome and deplorable when it comes to students, impacting nearly every aspect of everyday functioning, such as motivation, focus, perception, self-worth, and mood (Saeed et al., 2018). After COVID-19, psychological discomfort has worsened due to inequities and disparities in the socioeconomic determinants of health, such as financial position, immigrant background, language barrier, parents' educational level, and access to proper healthcare, for example (Elharake et al., 2022).

Impaired mental health is correlated with reduced productivity, diminished quality of life, and disability and is considered a fundamental aspect of overall well-being. Severe medical disorders are linked to psychological suffering, which manifests as sadness, anxiety, and depression. There is rising worry over psychological anguish, financial difficulty, academic load, peer competitiveness, ongoing pressure to perform, and concerns about the future are a few major stresses that students may experience. There may be significant adverse effects from these stresses. Depression and anxiety are examples of psychological anguish that can lead to significant medical issues. Stress for students includes things like financial difficulty, academic load, peer competitiveness, ongoing pressure to perform the best, and challenges that the future may bring. These pressures may significantly impact a student's academic performance, capacity to advance, and decision to remain enrolled in school (Dalky and Gharaibeh, 2019).

According to recent polls, University students reported feeling about 43% more melancholy than they could handle, 63% more anxious than they could handle, and 86% more overwhelmed by all they had to complete. Various studies have revealed that the prevalence of depression differs significantly between genders, with higher rates typically observed in women compared to men. Campus-based resources are readily accessible to aid students in dealing with mental health challenges; however, prior research has indicated that a considerable number of students do not seek medical assistance for such issues (Meeks et al., 2023).

Research has shown that gender disparities may affect college-age students' academic performance and mental health difficulties (Asher-BlackDeer et al., 2021). In studies comparing gender, some found substantial differences between males and females, while others found no such differences. 10–15 In general, female undergraduate students had higher rates of depression than male students (Mirza et al., 2021). The research objectives center around identifying the risk factors contributing to students' mental health in the Department of Community Medicine & Public Health Sciences, Liaquat University of Medical & Health Sciences, Pakistan, after the COVID-19 pandemic.

2. METHODOLOGY

Study population, data source and sample size

Ethical approval was obtained prior to the study from Liaquat University of Medical & Health Sciences Pakistan. All the participants gave a consent form to participate in the study. This was a cross-sectional study and purposive sampling. Using the following sample size formula for our study, where $P = 0.5$ was assumed as the population proportion was unknown and the margin of error was set at 0.08, the optimal sample size for this cross-sectional study was calculated to be about 152.

$$n = Z^2 \times \frac{P(1-P)}{d^2}$$

Where,

n = Sample size

Z = Z-score which is 1.96 (95% Confidence interval)

P = Population proportion (Assumed as 0.5)

d = Margin of error (0.08)

A study sample of 152 participants was collected from Undergraduate & Graduate Students. The inclusion criteria were undergraduate and graduate students and the exclusion criteria were excluding final-year undergraduates and postgraduate students since it was predicted that they would have a high non-participation rate and an excessively high level of anxiety.

Questionnaire

We created a questionnaire and had it validated by two professional psychometricians to describe the demographics, knowledge, and awareness of mental health among students at Liaquat University of Medical & Health Sciences in Pakistan. We collected the questionnaire items from those studies and checked the correct answers. The questions were designed to highlight several issues concerning mental diseases, social stigma, and other factors influencing mental health. After obtaining consent from the participants, a validated questionnaire was used to collect data. A pilot study with 30 participants was conducted to assess reliability. The results of the pilot research were not included. Furthermore, we discovered a standardized Cronbach's alpha of 0.85, which is quite high for assessing the questionnaire's reliability. It revealed that our questionnaire's internal consistency is quite good, which may contribute to correctly recognizing the following items on the questionnaire. The questionnaire was then distributed among the participants. The questionnaire was completed and submitted by 168 participants, of which 152 were usable.

Distribution of questionnaire and data collection

The students filled out a printed questionnaire by answering the questions on it. Data were entered into Microsoft Excel after the questionnaires had been completed. Using Microsoft Excel to enter data allows for simple sorting and filtering. Data analysis was done by organizing the data in various ways to identify trends and patterns. In this study, we sort responses by age group, gender, or other demographic information to see if there are any differences in responses based on these factors. In addition, the data was imported into other complex statistical analysis programs such as SPSS using Microsoft Excel. This is especially useful if the data analysis requires more advanced statistical techniques than Excel can provide.

Statistical Analysis

The demographic characteristics of the respondents were described using descriptive statistics, such as the frequency and percentage (%). A binary logistic regression model was used to analyze the effects of socio-demographic and other variables on outcome variables, i.e., mental health problems. The logistic regression results were analyzed for data analysis, with the significance level set at $p < 0.05$ using the SPSS version 26.0 (IBM SPSS Statistics, Armonk, NY, USA). The odds ratio (OR) and 95% confidence interval (CI) were used to identify the relationship between the mental health problem and associated demographic factors.

3. RESULTS

The results showed that female students were at higher risk as compared to their male counterparts, and stress and depression levels for students aged between 18-25 age groups were higher as compared to their counterparts aged 26-35. Compared to their married counterparts, single students encountered notably elevated levels of mental health issues. There were higher tendencies of mental health issues observed among undergraduate students compared to their postgraduate counterparts. Regarding socio-economic status, middle-class students were found to be more affected than upper-class students (Table 1).

Table 1 Demographic Profile of Respondents

Variables	Respondents	Frequency	Percentage (%)
Gender	Male	36	23.7
	Female	116	76.3
Age	18-25	148	97.4
	26-35	4	2.6
Marital Status	Single	142	93.4
	Married	10	6.6
Education Level	Undergraduate	118	77.6
	Postgraduate	32	22.4
Socio-Economic Status	Middle Class	128	84.2
	Upper Class	10	6.6
Residency	Urban (Bachelor)	10	6.6
	Rural (Bachelor)	32	21.1
	Urban (with family)	38	25.0
	Rural (with family)	66	43.4
Mental health problem	Yes	30	19.7
	No	122	80.3

The goodness of fit test

Figure 1, 2, and 3 shows the goodness of fit of the final model, which justifies the credibility of our model by fulfilling three necessary assumptions (namely the Hosmer–Lemeshow test, the classification table, and the area under the curve and ROC curve). The Hosmer and Lemeshow test is not statistically significant ($\chi^2(8) = 7.124$, sig. value = 0.523), indicating an adequate fit of the model. Figure 2 provides additional information that is useful in describing how well the model is fitting. Specifically, it presents information on the degree to which the observed outcomes are predicted by the model. The overall classification accuracy is good (at 84.7%).

The area under the ROC curve, which ranges from 0 to 1, could also be used to assess the model discrimination. A value of 0.5 means that the model is useless for discrimination, and values near 1 mean that higher probabilities will be assigned to cases with the outcome of interest compared to cases without the outcome. A measure of ability of the model to discriminate those persons who have mental health problems vs those persons not having mental health problems. The area under the curve for this model is 0.830 (near to 1), good model fit to the data. All three methods indicate good model fit of Preliminary Final Model.

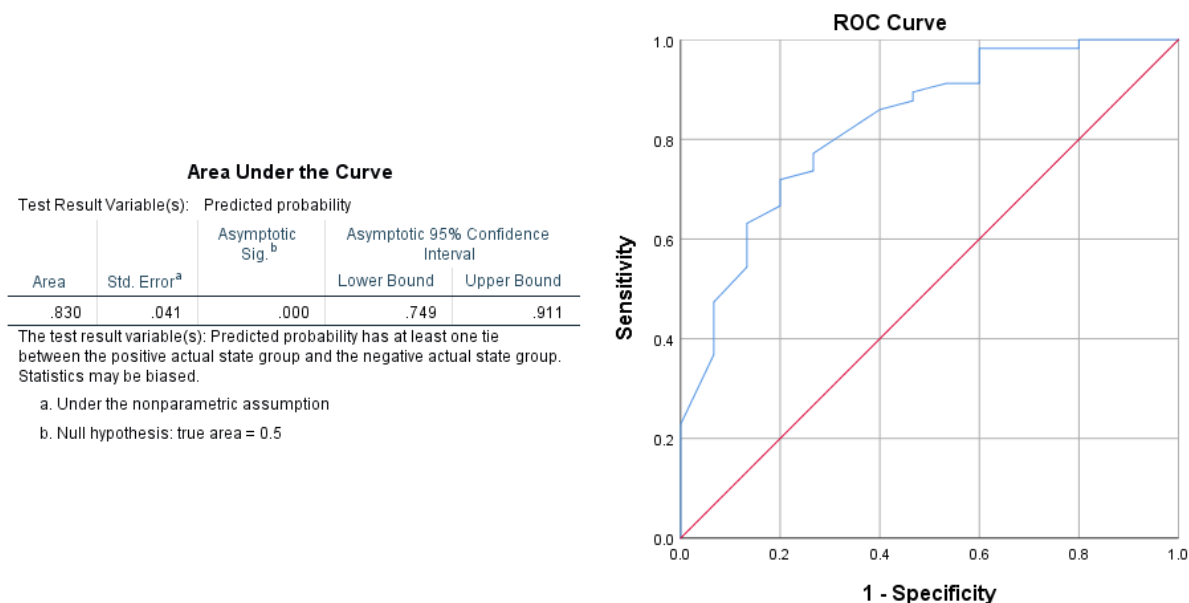
Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	7.124	8	.523

Figure 1 Hosmer and Lemeshow Test

Classification Table^a

Observed		Predicted		Percentage Correct
		Mental health problem Yes	No	
Step 1	Mental health problem Yes	12	18	40.0
	No	4	110	96.5
Overall Percentage				84.7

a. The cut value is .500

Figure 2 Classification Table**Figure 3** Area Under the Curve (AUC) and ROC Curve

Logistic Regression

Based on Table 2, marital status is a positive and significant predictor of the probability of mental health problems among students ($b = 1.721$, $S.E. = 0.878$, Wald $\chi^2(1) = 3.845$, $p = 0.049$). The odds ratio for marital status is 5.592, it means that the odds of having a mental health problem are 5.592 times higher for individuals who are single compared to those who are married. Socio-economic status is a positive and significant predictor of the probability of mental health problems among students ($b = 2.459$, $S.E. = 1.254$, Wald $\chi^2(1) = 3.846$, $p = 0.049$). The odds ratio for socioeconomic status is 11.691, which means that the odds of mental health problems are 11.691 times higher in the lower and middle classes than the upper class.

Urban with family (Residency 2) is a positive and significant predictor of the probability of mental health problems among students ($b = 2.016$, $S.E. = 1.003$, Wald $\chi^2(1) = 4.044$, $p = 0.044$). The odds ratio for urban areas with family is 7.511, it means that the odds of having a mental health problem in urban areas with a family are 7.511 times higher compared to urban areas where individuals are bachelors. Rural with family (Residency 3) is a positive and significant predictor of the probability of mental health problem among students ($b = 2.785$, $S.E. = 1.015$, Wald $\chi^2(1) = 7.535$, $p = 0.006$). The odds ratio for rural areas with family is 16.206, it means that the odds of having a mental health problem in rural areas with a family are 16.206 times higher compared to urban areas where individuals are bachelors.

Table 2 Logistic regression model showing the crude and adjusted OR (95%CI) for Mental Health Problems among Students

Variables	B	S.E.	Wald	p-value	OR (95% CI)
Gender	0.794	0.678	1.373	0.241	2.212 (0.586, 8.346)
Marital status	1.721	0.878	3.845	0.049*	5.592 (1.001, 31.253)
Socio-economic status	2.459	1.254	3.846	0.049*	11.691 (1.001, 136.47)
Residency (1)	-0.200	0.801	0.062	0.803	0.819 (0.170, 3.935)
Residency (2)	2.016	1.003	4.044	0.044*	7.511 (1.052, 53.606)
Residency (3)	2.785	1.015	7.535	0.006*	16.206 (2.218, 118.414)
Monthly income of parents (1)	-0.074	0.779	0.009	0.924	0.929 (0.202, 4.273)
Monthly income of parents (2)	-0.297	0.592	0.251	0.616	0.743 (0.233, 2.372)
Educational level	-0.831	0.692	1.441	0.230	0.436 (0.112, 1.691)

*Significant level < 0.05; Dependent variable = Mental Health Problem; B = unstandardized regression; S.E = Standard Error; OR = Odds ratios

4. DISCUSSION

This study attempted to examine the burden of mental health issues on students after the covid-19 pandemic and to measure anxiety, depression and stress among them especially in degree courses in the annual and semester examination system of Liaquat University of Medicine and Health in Jamshoro, Pakistan. After the pandemic students' situation becomes even more tense and decrepit, affecting almost every area of their daily functioning, including motivation, attention, perception, self-esteem, and emotions. The study further unveiled that female student exhibited higher tendencies toward mental health problems compared to their male counterparts, possibly due to hormonal monthly changes. Additionally, it indicated that undergraduate students below the age of 25 experienced a higher level of mental health issues, including suicidal thoughts, anxiety, and depression, compared to their older counterparts (undergraduates and postgraduates). Adewuya et al., (2006) supported these findings by reporting that anxiety, depression, and suicidal behavior were significant public health concerns among medical students and young individuals (ages 18-25) following the Covid-19 pandemic.

Similarly, in 2019 American College Health Association (ACHA) National College Health Assessment evaluated the health of 67,972 college students across the US and found that stress (34.2%), anxiety (27.8%), trouble sleeping (22.4%), and depression (20.2%) were the most common causes of academic underperformance. Furthermore, 47.6% of female students and 37.1% of male students reported feeling depressed, while 50.7% of men and 71.8% of women said they had overwhelming anxiety in the previous year. Around 2% of students attempted suicide in the prior year, and 13% of females and 11.6% of men reported having "seriously pondered" suicidal thoughts in the preceding year (American College Health Association, 2019).

The study's alarming discovery revealed that single students facing hostilities and living far away from their families and homes experienced severe post-Covid-19 health issues, notably affecting their mental well-being due to academic pressure, challenges in managing day-to-day life, financial constraints faced by both their families and themselves during the pandemic. On the other hand, students whose family members or relatives suffered covid 19 were under continuous stress of the health devastations of their loved ones. Thus, these groups were not only affected by anxiety, depression, and peer pressure to the extent of suicidal thoughts. There is a well-established mental health counseling unit with qualified, well-versed personnel for professional help in a confidential manner. But the majority considered it as a stigma \taboo to reach out for professional mental counseling help which was highly encouraged. Keeping in view these findings, seminars were organized to enlighten the strategies for positive mental health and normalize the approach to reaching out for help.

Thus, de-stigmatizing mental health needs for counseling and reaching out is a norm. This finding is in accordance with the expert's prediction, as reported by Natarajan, (2020) that the COVID-19 pandemic will cause a lot of mental health issues for people, including healthcare professionals. A similar study at the Midwestern University, USA, was carried out where the study group experienced symptoms of severe or extremely severe depression (28.3% faculty/staff, 31% students), stress (31.1% faculty/staff, 33.9% students), anxiety (38.6% faculty/staff, 41.8% students). A significant difference was found between student and faculty/staff mental health management techniques and apparent obstacles to avail of mental health help from professionals (Meeks et al., 2023).

5. CONCLUSION

The impact of the COVID-19 pandemic on students' mental health is evident in various factors. Living in a rural area, having a low income, being connected to healthcare professionals, or knowing someone who had COVID-19 were linked to lower mental health scores. As students and researchers explore combining in-person and online learning in the future, our findings underscore the importance of considering the social impact on students' mental well-being. This offers a starting point to identify and support those at higher risk of social isolation and negative psychological consequences. Urgent action is required through telemedicine to address the surge in mental illness among students and young individuals. Simultaneously, policymakers must proactively establish mechanisms and safety nets for preventive mental health interventions, preparing for potential future epidemics.

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Author Contributions

Mohamad Arif Awang Naw: Contributed in the drafting of the manuscript, conception and design of the study, analysis, interpretation of data and final approval. Arsalan Humayun: Contributed in acquisition of data, analysis, interpretation of data, and final approval.

Ethical Approval

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee, Liaquat University of Medical & Health Sciences, (LUMHS) Pakistan. (Ethical approval code: DOC#LUMHS/CM/-474, Issue dated: 12/09/2022).

Informed Consent

Not applicable

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This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interest.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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