

## ORIGINAL RESEARCH

# Impact of COVID-19 Pandemic on Mental Health of University Students in Pakistan

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## Abstract

**Purpose:** A novel coronavirus, SARS-CoV-2 was identified as the cause of COVID-19 eventually led to the declaration of Public health emergency of international concern and a pandemic by WHO due to its exponential global spread. Present study was conducted to investigate the impact of second wave of pandemic on mental wellbeing and social behaviors among university students of Pakistan during this crucial period of COVID-19 infection. **Methods:** A cross-sectional analytical study was designed to evaluate the psychosocial impact during the current COVID-19 outbreak among the students of The Islamia University of Bahawalpur, Pakistan. Snowball sampling or chain referral sampling procedure was adopted to recruit the participants in the study. Verbal informed consent was taken from all participants before recruitment in the study irrespective of their gender, age and socioeconomic status. **Results:** Mental health of university students during COVID-19 epidemic was affected to a varying degree revealing that 26.66% were recorded to have mild, 27.15% moderate and 17.04% suffering from severe anxiety out of total 1029 students. Students who were residing in urban areas with parents and having a steady family income were negatively associated and found protective factors against anxiety. However, having a relative or an acquaintance infected with COVID-19 was an independent risk factor for experienced anxiety. Positively associated factors with the level of anxiety symptoms included economic stressors, effects on daily-life, and academic delays whereas social support was negatively correlated with anxiety in COVID-19 related stressors. **Conclusion:** Public health emergencies and such pandemic are exerting serious psychological impacts on university students. It is recommended that the higher authorities should plan better policies to reduce this impact for the provision of high quality and timely crisis-oriented psychological services to university students.

**Key Words:** Psychosocial impact; anxiety; Covid-19 stressors; policies; public health emergencies; pandemics

## Introduction

Coronavirus family has caused 3 epidemics (SARS-2003, MERS-2012, and COVID-2019) over the past few decades affecting large number of people globally.<sup>1</sup> Earlier epidemic was reported on December 12, 2019 epidemiologically associated with a seafood market of Wuhan, Hubei Province of China when some cases of pneumonia of unknown etiology were reported.<sup>2</sup> The clinical manifestation of

most of the patients was dry cough, dyspnea, and fever. Zoonotic to human and then human to human transmissions of pathogens were reported in all thrice outbreaks. Since then, the quantity of cases increased rapidly inside and outside Wuhan, occupying to 34 cities of China by 30 January 2020.<sup>3</sup>

It was named as coronavirus disease 2019 (COVID-19) after the identification of a novel coronavirus, SARS-CoV-2 as the cause of this pandemic in China and other parts of the world. Eventually, WHO declare Public health emergency of international concern on January 30, 2020 and a pandemic on March 11, 2020 due to its exponential global spread.<sup>4</sup> The COVID-19 appeared to be more contagious due to its diverse epidemiological and biological characteristics than earlier pandemics such as SARS-2003, MERS-2012.<sup>5</sup> It has affected more than 200 countries globally with 70,461,926 total cases and 1,599,704 deaths as of December 14, 2020.<sup>6</sup> Case-fatality rate (CFR) among confirmed cases of COVID-19 is estimated at 6.80%, despite its significant infectivity rate. Majority of the deaths are typically occurring among the patients above 80 years of age, having multiple comorbidities and the immunocompromised population.<sup>7</sup>

In Pakistan, after a brief hiatus of following the first case which was reported on February 26, 2020, Covid-19 cases spiked as more pilgrims returned from Iran and a large number of members of Tableeghi Jamaat, a religious congregation were also tested covid-19 positive, affected more than 438,425 persons and 8,796 deaths till December 14, 2020. Covid-19 epidemic in Pakistan posed a serious challenge to counter it with limited resources of country.<sup>8,9</sup>

Covid-19 pandemic led to closure of all educational institutions globally and thus giving rise to multiple challenges at all stages and levels of education in particular for students.<sup>10</sup> Higher education commission (HEC), Pakistan, institutional administrators, teachers, students, and other stakeholders are making considerable efforts and planning to optimally utilize the available technology for continuing the process of education and minimizing the gaps that are ongoing in consequent of the current pandemic of COVID-19.<sup>11</sup>

Psychological distress is strongly associated with widespread outbreaks of infectious disease, such as COVID-19 and symptoms of mental illness appeared in general population.<sup>12</sup> The current global pandemic also has consequences for mental health, as happened in some previous health emergencies.<sup>13</sup> These manifestations should be addressed by psychiatrists across the world, their

correlates, and strategies to manage them that counter both the needs of specific populations and the precautionary measures essential to limit the spread of COVID-19.<sup>14</sup>

There are several studies on the psychological impact of the Covid-19 epidemic on the patients, medical professionals, general public, children, and older adults in Pakistan as well as all over the world.<sup>15,16</sup> However, no detailed investigation on the psychological impact and mental health status of university students bearing the epidemic has been conducted till now. The aim of the present study was to investigate the impact of current pandemic on mental wellbeing and social behaviors among university students during this crucial period of COVID-19 infection.

## Material and Methods

### Participants and Setting

A cross-sectional analytical study was designed to evaluate the psychosocial impact during the current COVID-19 outbreak among the students of The Islamia University of Bahawalpur, Pakistan. A snowball sampling or chain referral sampling procedure was adopted to recruit the participants in the study. Students who gave verbal informed consent were recruited in the study irrespective of their gender, age and socioeconomic status. The pre-COVID-19 period was defined as from December 2019 until February 2020 while post-COVID-19 period was defined from March 2020 until June 2020. Ethical approval was obtained from the Departmental Research Committee (DRC) (UCCM-DRC-003-2020, Dated April 15, 2020). All the standards of Declaration of Helsinki were followed strictly to execute the study on Human subjects.

### Data Collection and Procedure of Study

Students were invited by using electronic and social media resources as the Government of Pakistan suspends all kind of social gathering, public meetings, transport and travelling to minimize direct personal interactions and instruct to stay at home. All the participants were informed about this study through University website, dedicated social media resources etc. Data was collected over 30 days (November 11, 2020- December 10, 2020) during the exponential phase of COVID-19 in Pakistan under the strict enforcement of lockdown. Undergraduate & graduate students belonging to health & medicine

disciplines, enrolled in University College of Conventional Medicine, The Islamia University of Bahawalpur, Pakistan were recruited initially and they were encouraged to disseminate the information to others for the collection of data. Mental health status was assessed by structuring an anonymous online questionnaire ensuring the confidentiality and reliability of the data of all respondents. All the respondents were considered eligible who provided consent, complete information, and followed the directions to a validity item.

## **Generalized Anxiety Disorder Scale (GAD-7)**

The online questionnaire (Google online doc/form) was designed comprising of basic demographic characteristics such as name, gender, age, parental occupation and economic status/monthly income, religion, and contact information. Personal information of the entire participants including names and contact details were anonymized to maintain and protect confidentiality. Cognitions and preventive behavior towards COVID-19 and the availability of social support was also inquired.

The participants responded to the 7-item Generalized Anxiety Disorder Scale (GAD-7) which includes seven core symptoms, i. Feeling nervous, anxious, or on edge; ii. Not being able to stop or control worrying; iii. Worrying too much about different things; iv. Trouble relaxing; v. Being so restless that it's hard to sit still; vi. Becoming easily annoyed or irritable; vii. Feeling afraid as if something awful might happen.

Respondents report their symptoms using a 4-item Likert rating scale ranging from 0 (not at all sure), 1 (Several days), 2 (Over half the days), 3 (Nearly every day). The GAD-7 is a valid and reliable tools for the assessment of psychological impact and mental health among society during these circumstances (Cronbach's  $\alpha = 0.911$ ).<sup>17</sup>

## **Data analysis**

Demographic and other selected characteristics of the respondents were analyzed by descriptive statistics. A univariate analysis (Nonparametric test) was used to reveal the significant associations between anxiety level and characteristics of sample.<sup>18</sup> Statistically significant variables were screened and included in multivariate logistic regression analyses. Odds ratio (OR) with 95% confidence interval (CI) was used to demonstrated the strength of association. Spearman's rank correlation coefficient was

used to evaluate the association between COVID-19-related stress factors, suspension or delays in curricular/academic activities, economic and social stressors and anxiety level. A two-tailed  $p < .05$  was considered statistically significant. All statistical analysis were performed using SPSS Statistic 21.0 (IBM SPSS Statistics, Chicago, IL, United States).

## Results

### Baseline characteristics of Participants

The online questionnaire was filled by 1045 participants out of 1500 invited individual. The response rate was calculated as 69.66%. The remaining individuals who were not willing to participate in the study (n=455) provided no valid reason. Out of 1045 respondents, 16(1.53%) individuals did not completely fill the questionnaire and eventually excluded from the final calculations. So, there were total 1029 respondents, 544 (52.86%) were male and 485 (46.13%) were female recruited in the study.

### Mental Health Status of university students during the COVID-19 outbreak

Mental health of university students during COVID-19 epidemic was affected to a varying degree. No symptoms of anxiety was recorded in 27.45%, while 26.66% were recorded to have mild, 27.15% moderate and 17.04% severe anxiety out of total 1029 students as shown in Figure 1. The ratio of anxiety and the discipline wise details of students are given in Table 1.

### Association of Anxiety with Demographic variables of students

The demographic and selected characteristics of the study population are shown in Table 2. Among the sample of 1029 university students, male were 544 (52.86%) and female were 485 (47.13%). Most of the respondents lived in Punjab Province; 603 (58.60%) lived in rural areas, 721(70.06%) lived with their parents, and 749 (72.78%) of the parents of students did not have a steady income. Most participants 1017 (98.9%) had no relatives or acquaintances who were infected with COVID-19.

Significant association ( $P < 0.001$ ) between severe level of anxiety and female gender 94 (19.38%), students from rural areas 98 (16.25), without a steady income 111(14.81%) and students not living with parents 32(10.38) was reported. Table 2 shows the detailed relationship between the demographic variables of students and level of anxiety.

## **Factors associated with anxiety during the COVID-19 epidemic**

Results of factors associated with anxiety during the COVID-19 crisis are presented in Table 3 by ordinal multivariate analysis. Significance factors from the univariate analysis were included in the ordered logistic regression analysis.

## **COVID-19-related stress factors and level of anxiety**

Worry about interruption or delay in academic activities ( $r = 0.217$ ,  $P < 0.001$ ), economic influences ( $r = 0.321$ ,  $P < 0.001$ ) and the influence of the epidemic on daily life ( $r = 0.226$ ,  $P < 0.001$ ) were also moderately and positively correlated with the level of anxiety while a negative association between social support and anxiety symptoms during the COVID-19 outbreak was revealed ( $r = -0.121$ ,  $P < 0.001$ ) as shown in Table 4.

## **Discussion**

National Action Plan for Corona virus disease (Covid-19) by Government of Pakistan have been enforced aimed at National effort for response to COVID-2019 emergency in Pakistan while ensuring continual maximum preparedness and optimal and effective response capacity to the current pandemic COVID-2019. Government of Pakistan suspends all the public meetings, transport and travelling to minimize direct personal interactions and instruct to stay at home and complete lockdown in Pakistan was observed on March 12, 2020 for 15 days which is being extended till now as the cases of COVID-19 are rising gradually influencing the psychosocial health of people and economy of country.<sup>10</sup> These precautionary measures undoubtedly exert some impact on the education and the growth of students. Similar reports have been documented from China revealing that closure of all institutes, social distancing, travel warnings and bans, and extending the national holidays to control the outbreak

inevitably disrupted routine life and resulted in anxiety.<sup>19</sup> Some previous reports have also revealed that public health crises can have numerous mental consequences among general population as well as among the college and university students, which can be expressed as anxiety, stress and fear.<sup>20</sup>

We investigated that 26.66% have mild, 27.15 % moderate and 17.04% severe anxiety on account of the COVID-19 flare-up. Anxiety in students might be due to the impact of the epidemic on their studies and future work.<sup>21</sup> Place of residence, source of parental income, whether living with parents and whether a relative or an acquaintance was infected with COVID-19 is strongly associated with level of anxiety. High level of anxiety was recorded among the students residing in rural areas as compared to urban areas which might be due to better health and education resources in cities. Living with parents was another favorable factor against feeling anxious. Previous studies have indicated that the risk factors associated with emotional and anxiety disorders in adults include the death of parents in childhood, not living with parents, and parents' psychological problems and mental illnesses, which are consistent with the results of this study.<sup>22,23</sup>

The COVID-19-related stressors, which include economic stressors, effects on daily life, and academic delays, were positively associated with anxiety symptoms during the epidemic. E-learning methods of teaching are being recommended by higher authorities in Pakistan to reduce the academic loss of students. Despite the world wide adoption of e-learning, it was never considered as a part of formal education in Pakistan by many institutions until the spread of Covid-19. However, in spite of its multiple advantages there are quite a few limitations of e-learning such as social isolation, lack of student teacher interaction and connectivity issues etc.<sup>24,25</sup> This sudden interruption of academic activities might have led to stress and anxiety and negative psychological impact among students.

Significant impact on the economy of the country and on the life of individuals in addition to the national health crises due to these epidemics have recorded in similar studies.<sup>26</sup> Lose of source of income lead to anxious feeling about paying their tuition fees.<sup>27</sup> This result suggests that effective and robust social support is necessary during public health emergencies.<sup>28</sup> Many appreciable measures were taken by the Government of Pakistan to help the poor populace of the country which includes Rs1.13 trillion (\$7 billion) stimulus package to offer relief to the economy and people during COVID-19 announced by federal

government. One of the biggest reliefs was Ehsaas Emergency Cash programme offering one-time cash assistance of Rs. 12,000 each to support 12 million families.<sup>10</sup>

Specific strategies providing mental health services in an easily accessible manner should be developed to minimize the impact of these health emergencies. These includes online surveys to assess the scope of mental health problems; mental health education by developing online materials; online counselling and self-help services material; telepsychiatry consultation by developing structured letters; telemedicine services for diagnostic and counselling purposes; online mental health services are needed which should be easily accessible to lower socioeconomic society.<sup>29,30</sup>

## Limitations and Strengths

Our study has several limitations. We adopted snowball sampling or chain referral sampling procedure due to current conditions, limited resources and time-sensitivity of the COVID-19 epidemic rather random selection of the sample. Furthermore, this study is limited to the students who had internet resources, smartphones, whatsapp and e-mail IDs. This study conducted among university students those represents the educated population of the country, so it should not be generalized to the whole population. The level of anxiety and stressor factors in uneducated population may be varied from the results. Despite these limitations, our study presents vital data regarding the psychological impact of COVID-19 outbreak and provides health authorities and researchers a brief mental health status to assist their efforts and policies to fight against negative psychological impact of COVID-19 epidemic in vulnerable groups.

## Conclusion

Mental health of university students during COVID-19 epidemic was affected to a varying degree revealing that 26.66% were recorded to have mild, 27.15 % moderate and 17.04% severe anxiety out of total 1029 students. Students who were residing in urban areas with parents and having a steady family income were negatively associated and found protective factors against anxiety. However, having a relative or an acquaintance infected with COVID-19 was an independent risk factor for experienced anxiety. Positively associated factors with the level of anxiety symptoms included economic stressors, effects on daily-life, and academic delays whereas social support was negatively correlated with anxiety

in COVID-19 related stressors. Public health emergencies and such pandemic are exerting some serious psychological impacts on university students. It is recommended that the higher authorities should plan better policies to reduce this impact for the provision of high quality and timely crisis-oriented psychological services to university students.

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## Disclosure

Authors declare no conflict of interest.

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**Table 1: Discipline wise ratio of anxiety among university students**

Students	Anxiety level	Number	Ratio (%)
Arts & Social Sciences (n=122)	Normal	25	22.32
	Mild	39	34.82
	Moderate	41	33.60
	Sever	17	15.17
Basic & Applied Sciences, (n=147)	Normal	26	17.68
	Mild	41	27.89
	Moderate	45	30.61
	Sever	35	23.80
Medical & Pharmaceutical Sciences, (n=434)	Normal	176	40.55
	Mild	97	22.35
	Moderate	82	18.89
	Sever	79	18.20
Engineering and Technology, (n=121)	Normal	33	27.27
	Mild	37	30.57
	Moderate	30	24.79
	Sever	21	17.35
Islamic Studies and Languages, (n=55)	Normal	7	12.72
	Mild	11	20.00
	Moderate	21	38.18
	Sever	16	29.09
Commerce, Law and Business Administration (n=77)	Normal	03	3.89
	Mild	22	28.57
	Moderate	40	51.94
	Sever	12	15.58
Agricultural Sciences and Technology, (n=73)	Normal	07	11.11
	Mild	22	34.92
	Moderate	35	47.94
	Sever	09	14.28

**Table 2: Association of Anxiety with Demographic variables of students**

Variables	Total n (%)	Normal n (%)	Anxiety level			Statistics	P value
			Mild n (%)	Moderate n (%)	Severe n (%)		
<b>Gender</b>						-5.703 <sup>a</sup>	<0.001
Male	544 (52.86)	196 (36.02)	116 (21.32)	137 (25.18)	95 (17.27)		
Female	485 (47.13)	81 (16.70)	153 (31.54)	157 (32.37)	94 (19.38)		
<b>Place of Residence</b>						28.321 <sup>b</sup>	<0.001
Urban	374 (36.34)	178 (47.59)	74(19.78)	64(17.11)	58(15.50)		
Rural	603 (58.60)	290 (48.09)	121(20.06)	94(15.58)	98 (16.25)		
Un-classified	52 (5.05)	24 (46.15)	11 (21.15)	12 (23.07)	5 (9.61)		
<b>Steady Family Income</b>						-4.152 <sup>a</sup>	<0.001
Yes	280 (27.21)	122(43.57)	74(26.42)	44(15.71)	40(14.28)		
No	749 (72.78)	212(28.30)	231(30.84)	195(26.03)	111(14.81)		
<b>Live with Parents</b>						-3.517 <sup>a</sup>	0.012
Yes	721(70.06)	342 (47.43)	231(32.03)	176 (24.41)	72(9.98)		
No	308(29.93)	99 (32.14)	111(36.03)	66 (21.42)	32(10.38)		
<b>Relative or acquaintance got COVID-19</b>						-2.513 <sup>a</sup>	<0.001
Yes	12(1.16)	4(0.38)	5(0.48)	2(0.19)	1(0.09)		
No	1017(98.9)	876(86.13)	92(9.04)	41(4.03)	8(0.78)		

<sup>a</sup> Mann-Whitney test; <sup>b</sup>Kruskal-Wallis test.

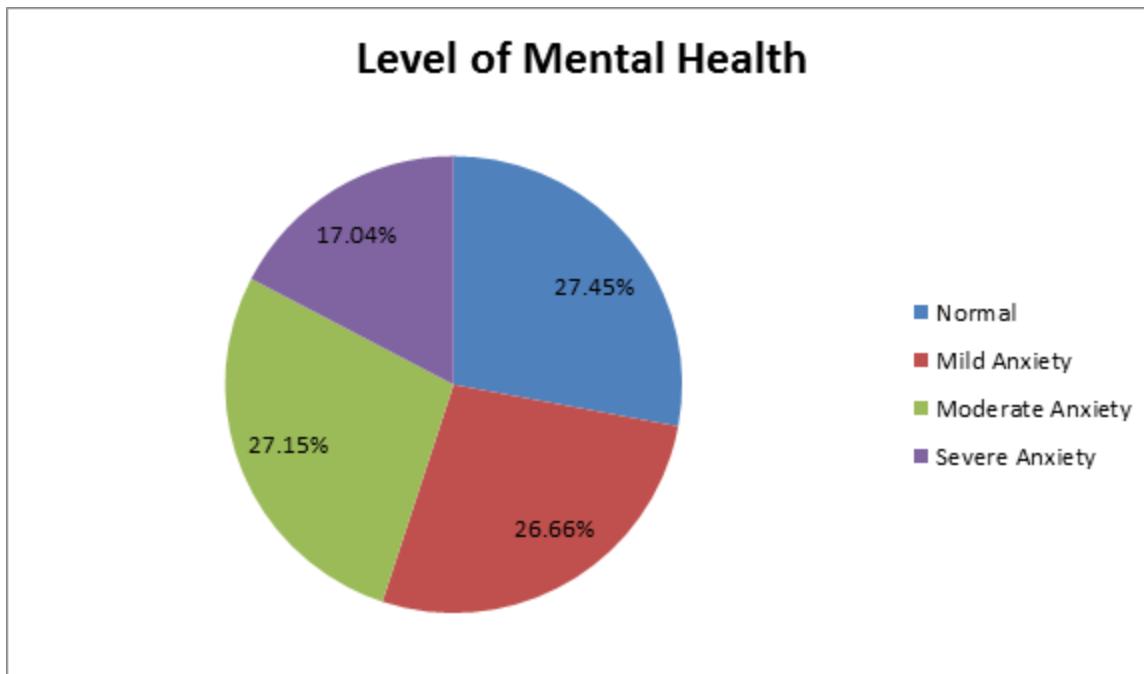
**Table 3: Factors associated with anxiety during the COVID-19 crisis**

Factor	Number	SE	OR	P	OR (95% C.I)
<b>Place of Residence</b>					
Urban	374 (36.34)	0.035	0.620	0.003	(0.610, 0.709)
Rural	603 (58.60)	0.074	0.712	0.021	(0.510, 0.713)
Un-classified	52 (5.05)	-	-	-	-
<b>Steady Family Income</b>					
Yes	280 (27.21%)	0.054	0.413	<0.001	(0.515, 0.613)
No <sup>a</sup>	749 (72.78%)	-	-	-	-
<b>Live with Parents</b>					
Yes	721(47.59)	0.125	0.625	0.015	(0.516, 0.705)
No <sup>a</sup>	308(47.59)	-	-	-	-
<b>Relative or acquaintance got COVID-19</b>					
Yes	12(1.16)	0.120	2.121	<0.001	(1.212, 2.104)
No <sup>a</sup>	1017(47.59)	-	-	-	-

SE: Std. Error, OR: Odds ratio, CI: Confidence interval, <sup>a</sup>reference group.**Table 4: COVID-19-related stress factors and level of anxiety**

Related Stressor	Anxiety Level	
	R	P
Worry about academic delays	0.217	<0.001
Worry about economic influences	0.321	<0.001
Influence on daily-life	0.226	<0.001
Social support	-0.121	<0.001

R: Correlation coefficient



**Figure 1: Mental Health Status of university students during the COVID-19 outbreak.**