

ALTERATION IN THE MENTAL HEALTH STATUS DUE TO THE COVID-19 PANDEMIC.Sumera Gul^{1*}, Muhammad Sufyan Aziz²**Abstract:**

Introduction: After the outbreak of COVID-19 from China, it rapidly spread across the whole world. COVID-19 pandemic changed the global dynamics. The sudden spread of the virus, uncertainty about the progress and factors related to the virus, unavailability of vaccine, lockdown, deaths in family and quarantine are a few factors that are expected to create a lot of concern for people. These factors can lead to heightened levels of stress and anxiety. **Objective:** We aim to study the effects of this pandemic on the mental health living in Pakistan. **Methods:** Beck Anxiety Inventory (BAI), Patient Health Questionnaire-9 (PHQ-9) and Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) questionnaires were used to assess the level of anxiety, level of depression and status of mental wellbeing via an online survey. **Results:** Results show an alarming level of variation in the normal mental health among the participants. We found that more females than males reported shifts from normal mental health status. Mental health of younger age groups were also found to be more affected by the effects of COVID-19 pandemic compared to older age groups. Education, profession or residence did not show any significant effects on the mental health status during COVID-19 pandemic. **Conclusions:** The novel corona virus is not only causing physical disease, but the pandemic is also affecting the mental health alarmingly.

Key words: COVID-19, Pakistan, BAI, PHQ-9, WEMWBS, mental health.

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INTRODUCTION:

In December 2019, a new viral disease emerged in Wuhan, a province of China¹. This new virus, the novel coronavirus, is a virus from the Corona virus family like SARS and MERS². After the spread of novel corona virus across the globe, World Health Organization (WHO) announced a new name for the virus: COVID-19 in February 2020³. WHO declared COVID-19 as a pandemic in March 2020^[3]. Emergency measures were taken throughout the world and the figures of the cases started increasing in various parts of the world. The Coronaviruses are a group of viruses that may cause illness in humans as well as in the animals¹. If infected with Coronaviruses, humans can develop mild to severe respiratory problems¹. The symptoms of COVID-19 are also similar to the symptoms of other previous coronavirus epidemics, which include fever, cough, dyspnea, fatigue etc.⁴. Since COVID-19 took shape of a pandemic, the outbreak of the virus became a threat to the overall public health and society⁵. Although, many symptoms are similar to the previous epidemics of coronaviruses, nevertheless, the COVID-19 pandemic, being a novel disease took the uncertainty to a higher level⁶. This uncertainty along with the continuous spread of COVID-19 can increase levels of stress and anxiety which can lead to alterations in mental health status. Previous epidemics have also reported alterations in mental health status. SARS outbreak in 2003 and corona influenza in 2009 has been reported to cause higher levels of anxiety, which led to depression and Post-Traumatic Stress Disorder in the people who survived the epidemic^{7,8}. Studies also report occurrence of higher levels of anxiety,

more negative psychological effect, frequent panic attacks, excessive psychomotor excitement, psychotic symptoms, delirium, and even suicidal tendency in the survivors of SARS epidemic^{9,10}. It is also evident that a disease that appears and spread rapidly can always “poses threat to the mental health of affected people and their close contacts”¹¹. The doctors, paramedical staff, patients, suspected cases and their contacts may have ever higher levels of anxiety, depression, rage and other mental health issues². The uncertainty, symptoms of disease, hospital stay along with the fear of multiple factors like doctors, quarantine, isolation, death and becoming a carrier are all some factors which can lead to deterioration of mental health in the long run². Fear of the disease, unavailability of vaccine, uncertainty, excessive information on social media, quarantine and lock downs create a stressful condition, in general^{11,12}. All of these stressors can lead to mental health issues as stress is a known factor causing various mental health issues^{11,13}. Furthermore, since there is only symptomatic treatment with no approved vaccine currently available, the level of anxiety is expected to be higher in general population¹. Research is sparse with regards to mental health issues during COVID-19 pandemic. This study was therefore, designed to study the impact of COVID-19 on the level of anxiety, depression and mental wellbeing of the general population living in Pakistan.

MATERIALS AND METHODS:

An online survey questionnaire was used for the collection of data. The website “Survey Planet” <https://www.surveyplanet.com/> was used for online survey and data collection¹⁴. The online survey questionnaire was circulated through

various social media forums. The first slide explained the study and people filled the forms with their free will. The time for collection data was 1200hrs on 10th July 2020 till 2300hrs on 13th July 2020. A total of 236 people participated in the study. 20 forms had incomplete information, therefore, they were excluded from the study. The questionnaire included demographic information, Beck Anxiety Inventory (BAI) to assess level of anxiety, Patient Health Questionnaire-9 (PHQ-9) to find the level of depression and the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) for the level of mental wellbeing¹⁵⁻¹⁷. This study was conducted in accordance with the Declaration of Helsinki.

Beck Anxiety Inventory (BAI): The BAI is a self-reporting anxiety assessing tool which uses 21 questions to screen the intensity of anxiety. It measures not only the physiological and emotional symptoms, but it also determines the symptoms related to the cognition. The participants filled the BAI on basis of their symptoms occurring over last 1 month. The four-point scale (0 to 3) used was as previously described¹⁵. Where 0 means 'not at all' and 4 means 'severely – it bothered me a lot'. The total score of the BAI was from 0-63 showing increasing level of anxiety from low/no anxiety to concerning level of anxiety.

Patient Health Questionnaire-9 (PHQ-9): PHQ-9 is based on 9 criteria of DSM-IV disorders to assess the occurrence of depression on the basis of the symptoms occurring over last 2 weeks¹⁶. It is hence a dual tool that can diagnose depressive disorders and establish level of severity of the disorder using same nine criteria items. PHQ-9 is a tool with analogous specificity and sensitivity to other measurement instruments¹⁶. A four-point scale (0 to 3) was used explaining the occurrence of symptoms over the period of last 2 weeks. Where 0 means 'not at all', 1 means 'sometime', 2 means 'often' and 3 means 'nearly every day'. The total score of the PHQ-9 was from 0-27 showing increasing level of depression from minimal/no depression to severe depression.

Warwick Edinburgh Mental Wellbeing Scale (WEMWBS): The WEMWBS is a known tool for assessing mental wellbeing. It is a 14 item self-reporting questionnaire¹⁷. The participants had to rate their responses on the basis of their feelings over the last two weeks. A five-point scale of 1 to 5 was used. Where 1 to 5 showed the increasing frequency of symptoms from 'none of the time' to 'all of the time'. On the basis of the scale the minimum score can be 14 and maximum score can be 70. Higher scores showed high mental wellbeing.

Statistical Analysis: SPSS version 22.0 was used to analyze the data. Descriptive statistics is used to report the demographic data. Pearson correlation is used to study the relationship of gender, surviving COVID-19, occurrence of COVID-19 in family and deaths in family due to COVID-19 with the level of anxiety, level of depression and level of mental wellbeing during the COVID-19 pandemic. One-way ANOVA is used to study the relationship of age groups, education, profession and residence with the level

of anxiety, level of depression and level of mental wellbeing during the COVID-19 pandemic.

RESULTS:

Table 1 shows the demographic data of the participants. Out of total 236 participants, 213 filled the questionnaire completely. Therefore, the data presented is of the 213 complete forms. The results are presented in percentages. Table 2 shows the frequency of level of anxiety, level of depression and level of mental wellbeing in the participants during COVID-19 pandemic. The results show that there is a higher occurrence of anxiety among the general population (42.7% of moderate anxiety and 50.7% with concerning level of anxiety). Level of depression is also found to be more. An alarming finding of the study is the lower number of people with a higher wellbeing. The people with higher mental wellbeing were only 3.8%. However, 59.2% people showed a lower mental wellbeing and 37.1% people had average mental wellbeing. The result suggest an alarming alteration in mental health status of people due to COVID-19 pandemic. Mean level of anxiety in our participants is found to be 38.11 ± 12.57 which is the range for concerning level of anxiety according to BAI. The mean level of depression was 9.3 ± 7.02 which is in the range for mild to moderate depression according to PHQ-9. The mean score for mental wellbeing was 39.88 ± 11.78 , which is in the range for the average mental wellbeing. Table 3 shows the level of anxiety, level of depression and level of mental wellbeing among different genders in the participants during COVID-19 pandemic. Gender showed a significant relationship with anxiety ($r = 0.139$, $p < 0.05$), depression ($r = 0.171$, $p < 0.05$) and mental wellbeing ($r = 0.310$, $p < 0.01$) following Pearson correlation. More females are having concerning level of anxiety, while occurrence of moderate anxiety is more in males during COVID-19 pandemic. More males than females have minimal to mild depression while moderate, moderately severe and severe depression is found more in females. Males generally show a higher number of people in each group of mental wellbeing status. More men than women reported to have contacted COVID-19 (27.03 % males and 23.02 % females). Significant relationship was found between surviving COVID-19 and depression ($r = -0.158$, $p < 0.05$) but a non-significant relationship of surviving COVID-19 with anxiety ($r = -0.134$, $p > 0.05$) and with mental wellbeing ($r = 0.086$, $p > 0.05$) was found following Pearson correlation. A significant relationship was found between occurrence of COVID-19 in family with the anxiety level anxiety ($r = -0.167$, $p < 0.05$) but a non-significant relations with depression ($r = -0.158$, $p > 0.05$) and mental wellbeing was ($r = -0.05$, $p > 0.05$) following Pearson correlation. The deaths that occurred in families and friends showed a significant correlation with the level of anxiety ($r = -0.328$, $p < 0.01$), level of depression ($r = -0.223$, $p < 0.01$), but a non-significant relationship with level of mental wellbeing ($r = 0.003$, $p > 0.05$) following Pearson correlation during COVID-19 pandemic. Table 4 shows level of anxiety, level of

depression and level of mental wellbeing among different age groups in the participants during COVID-19 pandemic. Exploring the data showed that higher levels of anxiety and depression were seen more in younger age groups. Younger age groups also showed lesser mental wellbeing compared to older age groups. People older than age 50 showed lesser levels of anxiety and depression and a better mental wellbeing. A significant relationship was found between age and the level of anxiety ($F=2.52$ $df5, 212$ $p<0.05$), depression ($F=3.88$ $df5, 212$ $p<0.01$) and mental wellbeing ($F=6.98$ $df5, 212$ $p<0.01$) following one-way ANOVA. Education did not show any significant relationship with the level of anxiety ($F=0.060$ $df4, 212$ $p>0.05$), depression ($F=0.902$, $df4, 212$ $p>0.05$) and mental wellbeing

($F=1.87$ $df4, 212$ $p>0.05$) following one-way ANOVA. No relationship was found between the area of residence with the level of anxiety ($F=0.89$ $df4, 212$ $p>0.05$), depression ($F=0.255$ $df4, 212$ $p>0.05$) and mental wellbeing ($F=0.176$ $df4, 212$ $p>0.05$) following one-way ANOVA. Profession was significantly related with mental wellbeing ($F=3.29$ $df6, 212$ $p<0.01$) and depression ($F=2.84$ $df6, 212$ $p<0.05$). However, no significance was found between level of anxiety ($F=1.66$ $df6, 212$ $p>0.05$) and profession following one-way ANOVA.

Table 1. Demographic data		Percentage
Gender	Males	34.7
	Females	65.3
Age groups	< 20	30.5
	21-30	45.1
	31-40	14.1
	41-50	6.1
	51-60	1.9
	>60	2.3
Residence	Punjab	80.8
	Sindh	11.7
	Khyber Pakhtoonkhah	3.8
	Baluchistan	0.9
	Kashmir	2.8
Education	Primary	0.9
	Secondary	19.7
	Bachelor	54.0
	Masters	21.6
	Phd and above	3.8
Profession	Student	48.4
	Doctors and paramedical	22.1
	Business	2.8
	Government employee	3.8
	Professional	10.3
	Retired	0.5
	Others/ House wife	12.2
COVID-19 Survivor		24.4
COVID-19 in family and friends		57.3
Death due to COVID-19		37.1

Table 2. Frequency of level of anxiety, level of depression and level of mental wellbeing in the participants during COVID-19 pandemic.		Percentage
Anxiety (BAI)	Low anxiety	6.6
	Moderate anxiety	42.7
	Concerning level of anxiety	50.7
Depression (PHQ-9)	Minimal/ No depression	30.5
	Mild depression	27.7
	Moderate depression	18.3
	Moderately severe depression	13.1
	Severe depression	10.3
Mental wellbeing (WEMWBS)	Low mental wellbeing	59.2
	Average mental wellbeing	37.1
	High mental well being	3.8

Table 3. Level of anxiety, level of depression and level of mental wellbeing among different genders in the participants during COVID-19 pandemic.

*p<0.05 and **<0.01 following Pearson correlation.

	Percentage	
	Male	Female
COVID survivor	27.03	23.02
COVID in family	66.22	52.51
Deaths due to COVID	45.95	32.37
Anxiety *		
Low anxiety	6.76	6.47
Moderate anxiety	51.35	38.13
Concerning level of anxiety	41.89	55.39
Depression *		
Minimal depression	37.84	26.61
Mild depression	31.08	25.60
Moderate depression	14.86	20.15
Moderately severe depression	10.81	14.39
Severe depression	5.41	12.95
Mental Well-being **		
lower mental well-being	55.41	51.15
average mental well-being	39.19	35.97
high mental well-being	5.41	2.87

Table 4. Level of anxiety, level of depression and level of mental wellbeing among different age groups in the participants during COVID-19 pandemic. *p<0.05 and **<0.01 following one- way ANOVA.

	≤ 20 years	21-30 years	31-40years	41-50years	51-60years	>60 years
COVID positive	30.76	22.92	23.33	15.38	0.00	80
Anxiety *						
No or Low anxiety	3.07	7.29	6.67	0.00	0.00	60.00
Moderate anxiety	47.69	38.54	33.33	53.85	100.00	40.00
Concerning level of anxiety	49.23	54.17	60.00	46.15	0.00	0.00
Depression **						
No depression	24.61	26.04	33.33	53.85	50.00	100.00
Mild depression	33.84	25.00	26.67	23.08	50.00	0.00
Moderate depression	20	18.75	16.67	23.08	0.00	0.00
Moderately severe depression	15.38	13.54	16.67	0.00	0.00	0.00
Severe depression	6.15	16.67	6.67	0.00	0.00	0.00
Mental Well-being **						
Lower mental well-being	66.15	64.58	50.00	38.46	0.00	20.00
Average mental well-being	33.84	32.29	46.67	61.54	75.00	20.00
High mental well-being	0	3.13	3.33	0.00	25.00	60.00

DISCUSSION:

The available information about the psychological impact of the previous coronavirus epidemics, which are similar of COVID-19, is very limited^{10,18}. COVID-19 belongs to the same

corona virus family as that of SARS. However, we also have a very limited information about the psychological effects of COVID-19 pandemic, since it is a new disease. To our knowledge, there is no reported data showing the levels of anxiety, depression and mental wellbeing from the people

of Pakistan during COVID-19 pandemic. The current study therefore, assesses the prevalence of various psychological alterations which can be associated to COVID-19 pandemic in Pakistan through an online survey. The results of the current study suggest a higher rate of anxiety, depression as well as lower mental wellbeing among the Pakistani population during the COVID-19 pandemic.

We report that 24.4% of the participants were COVID-19 survivors and 37.1 % of people reported deaths of their family members or friends due to COVID-19. The figures of the confirmed COVID-19 cases were 261,916 and the number of confirmed deaths due to COVID-19 were 5,522 as of 18th July 2020¹⁹. We also found that 57.3% of the total participants had a near family member or friend who got infected with COVID-19. Comparing these figures with the official confirmed figures, we have found a higher number of people who got infected with COVID-19¹⁹. The reason can be that the people who report for the testing are only the tip of the iceberg and the real number of cases are more than the official figures show. This can be due to the fact price of COVID-19 tests, compliance of the people and unavailability of the test kits.

A high level of anxiety, depression and lesser wellbeing was reported very recently¹¹. We also found alarming levels of anxiety, depression and lower mental wellbeing in our population. Almost half of the participants had concerning level of anxiety, around 70% of the people had some level of depression and more than half of the people had low level of mental wellbeing. This higher rate of mental health problems might be due to the ambiguity and little information about the COVID-19. Previously published data about SARS and other epidemics also reported higher levels of anxiety, depression, negative psychological effect, panic attacks and other disturbances in mental health status of people who survived SARS epidemic⁷⁻¹⁰. It was also reported that aspects like quarantine can induce many stress elevating factors like loneliness, monotony, rage, anxiety, and depression².

Studies suggest that females are affected twice as higher due to stress and anxiety related problems^{20,21}. We found that more females have concerning level of anxiety than males. More females have higher levels of various severity of depression than males. More males have higher levels of mental wellbeing than women. On the contrary, more males than females showed a low mental wellbeing as well. These levels can be due to the reason that COVID-19 is affecting the mental health of both men as well as women. Although previous reported data shows a non-significant gender differences in anxiety during COVID-19¹¹. However, we report a significant relationship of gender with anxiety, depression and mental wellbeing.

Previous data shows that age group of 21-40 years is most vulnerable age group regarding their mental health status and alcohol

consumptions than other age groups during the COVID-19 pandemic¹¹. Similarly, we found a significant correlation in the agegroups regarding anxiety level, level of depression and mental wellbeing. People of all ages are affected by the consequences of the pandemic. However, we found that younger people are the most prone age groups that is affected with COVID-19. They show higher levels of anxiety, depression and a lower level of mental wellbeing when compared with older age groups. Study suggested that stress can easily be triggered in young people as they are faster to gather all type of information via various sources through social media²². Although the death rate is highest among the people of 75+ years (14.3%) followed people of age group of 65-74 years (6.5%) when compared with younger people of age 18-44 years (0.8%) and age group of <17 years (0.02%)²³. It is evident from our and previous data that despite more fatality rate in older age groups, younger age groups are more risk of psychological disturbances.

CONCLUSION:

The present study gives an insight of the undesirable psychological effects of the COVID-19 pandemic. Current study shows that the COVID-19 pandemic is substantially affecting the mental health of general population. Although the number of cases in Pakistan are declining (2085, July 17th 2020 vs. 6825 on June 14th 2020) it is expected that the pandemic will leave long term effects on the mental health of the people¹⁹. The higher levels of anxiety, depression and a lower mental wellbeing found in our study can very easily lead to a potent psychiatric disorders in the long run. More studies are required to study the effects of the COVID-19 pandemic on a larger number of participants.

There are several limitations of the present study. The number of participants is 213. The study needs to be repeated with a bigger sample size to produce more significant results. We used self-reporting questionnaires. We got the questionnaires filled via online survey as physical interviews were not possible. There are chances of social desirability bias due to self-administration of the questionnaires. English is not first language of Pakistani. Understanding of the questionnaire, without the interviewer to translate all the questions in local language can also be a limitation. Possibility of irrational and misleading feedbacks is also there.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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AUTHORS' CONTRIBUTIONS: Sumera Gul conceived the study concept and design, did data analysis as well as the interpreted the results and wrote the manuscript.

Muhammad Sufyan Aziz did substantial contribution in formulating and disseminating the questionnaire. The author also analyzed the data, interpreted the results and critically analysed the manuscript.

CONFLICT OF INTEREST: No competing interest declared.

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