

COVID-19 pandemic impacted internet use and anxiety among general public during COVID-19 pandemic in Pakistan

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Abstract

Objective: To determine the association between internet use and anxiety among people during the coronavirus disease-2019 pandemic.

Method: The cross-sectional study was conducted across Pakistan from January 14 to February 21, 2021, which was the active phase of the coronavirus disease-2019 pandemic in Pakistan. The participants were aged at least 13 years having internet access regardless of gender or their location across Pakistan. The anonymous web-based survey was conducted using a questionnaire generated on Google Forms and disseminated through various social media platforms and WhatsApp groups. Anxiety symptoms were screened using the Depression, Anxiety and Stress Scale-21, while the Young Internet Addiction Test was used to evaluate symptoms of internet addiction. Data was analysed using STATA 16.

Results: Of the 1,145 subjects, 686(60%) were females and 459(40%) were males. A total of 257(22.5%) participants were found to have extremely severe anxiety and internet usage pattern was significantly associated with the level of anxiety ($p < 0.05$). Age, gender, social class and marital status were not significantly different ($p > 0.05$), while family income and area of living were significantly different ($p < 0.05$) in terms of anxiety levels. The odd of addictive internet use was 10.2 (95% confidence interval: 5.7-18.5) times greater in extreme anxiety individuals compared to individuals having no anxiety after controlling for other sociodemographic, health-related, behavioural and environmental factors during the pandemic.

Conclusion: A significant association of anxiety was found with internet addiction during the coronavirus disease-2019 pandemic.

Keywords: Internet addiction, Anxiety, Pandemic, COVID-19, Low-income countries. (JPMA 74: 99; 2023)

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Introduction

The coronavirus disease-2019 (COVID-19), undoubtedly the greatest public health catastrophe of modern times and a universal health concern in its active phase, brought a number of challenges in all domains of life, including the healthcare systems.¹ Quarantine and social distancing further intensified the misery, subsequently causing negative emotions in people.² Moreover, the public health measures undertaken to contain the spread of the lethal virus, including massive lockdowns, also negatively impacted people's quality of life.³ COVID-19 was not just a medical phenomenon affecting people physically. It affected the mental wellbeing of people as well, causing a massive psychological strain.⁴ This could actually mean that in a world where mental health problems were already on

the rise, the pandemic could have proven to be a catalyst.

Meta-analysis of 103 studies across the world indicated alarming levels of symptoms of mental illness, predominantly anxiety, during COVID-19, with a prevalence of 27.3% in the uninfected general population, and 39.6% in the infected population.¹ Subgroup analysis of a systematic review suggested the burden of anxiety during COVID-19 ranging from 28.3% to 54.6% in the developed world.¹ In South Asia, the pooled prevalence of anxiety during the pandemic was found to be 34.1%.⁵ In India, the burden of anxiety symptoms was 38.2% during the lockdown phase⁶ whereas in Bangladesh, the prevalence of anxiety was 57.9%.⁷ There is very limited literature on the prevalence of anxiety symptoms in Pakistan during the pandemic in the general population, with most studies having catered to the mental health of healthcare workers or the students.^{8,9} However, one study conducted on the general population suggested an alarming prevalence of 40% of moderate and severe anxiety symptoms in the general population.¹⁰

Anxiety is a multifactorial mental issue characterised by feelings of concern and worries manifested as emotional reactions to anything that seems threatening. Along with this feeling, anxiety is associated with muscle rigidity,

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exhaustion, attention deficit and agitation.¹¹ During the pandemic, there were multitudes of factors related to anxiety. One of the most contributing factors associated with anxiety was excessive use of the internet or internet addiction.^{12,13} Internet addiction is characterised by excessive use of the internet, the urge to frequently use the internet, repeated efforts to stop using the internet, loss of importance of time using the internet, and extreme uneasiness when not being able to use the internet.¹⁴ During COVID-19, information transmission through digital means—conventionally called the internet—became the only accessible method for the total non-interruption of social and work collaborations in an attempt to restore a new form of normality. The excessive use and high dependency on the internet might be the reason for internet addiction during the pandemic. Multiple studies across the world have indicated an alarming burden of internet addiction during COVID-19. One study in Indonesia showed a 14.1% prevalence of internet addiction, whereas studies in Bangladesh, Taiwan and China suggested 71%, 24.4%, and 36.7% internet addiction, respectively.¹⁵⁻¹⁷ Statistics from India suggest 20% moderate to severe internet addiction.¹⁸

During the pandemic, internet usage rose, and anxiety was likely to creep in. A study showed that in India, Malaysia, Mexico and the United Kingdom, participants scoring high on compulsive internet and social media use had much higher anxiety scores.¹⁹ Another study in Mexico indicated that participants with internet addiction were twice likely to have anxiety.¹² Literature on Italian students also suggests an association between internet addiction and anxiety mediated by the fear of COVID-19.²⁰

Excessive use of the internet has been associated with the spread of misleading information, causing fear, stress and worries that might ultimately result in anxiety and impaired functioning. Also, to verify the misinformation, internet usage also increases, which leads to a vicious cycle of internet addiction and mental health issues.^{12,21}

Pakistan is among the lower- and middle income countries (LMICs) with finite resources. Preventive and curative treatment of mental illnesses is not a priority in the Pakistani health setup. The advent of COVID-19 shook up the already exhausted mental health infrastructure in the country. To prevent the conversion of initial psychological symptoms to full-blown mental disorders, it is essential that their burden and associated factors are identified and proactively tackled. The current study was planned to determine the burden of anxiety and explore its associated factors in the Pakistani population during the COVID-19 pandemic.

Subjects and Methods

The online web-based cross-sectional study was conducted from January 14 to February 21, 2021, which was the active phase of the pandemic in Pakistan. After approval from the institutional ethics review committee, the sample size was calculated using OpenEpi calculator, with 80% power and 5% level of significance while assuming the prevalence of psychological morbidity in normal internet users to be 28-33%.²² The odds ratio was anticipated to be 1.5. The sample was inflated by 15% to account for refusals and incomplete forms. Additional details on the sample size can be found in the 'Sampling Size and Sampling Strategy' section of an earlier published article.²³

Those included were native Pakistanis of either gender aged at least 13 years who were familiar with Urdu or English languages, and were willing to participate. Overseas Pakistanis and foreign nationals living in Pakistan were excluded.

Informed consent was obtained from all the participants. In cases of participants aged <18 years, parental consent was taken, and contact details of parents/guardians were taken to verify the consent. The consent form and the study questionnaire were in both English and Urdu languages. To ensure cultural and contextual relevance, content validity was done. A psychiatrist reviewed and translated the English version of the survey into Urdu; The translated Urdu version was then back-translated into English to make sure answers were relevant and comparable in meaning and context.

The study questionnaire was generated on Google Forms, and a relevant link was generated to allow access to that form. The link was disseminated via social media platforms, including Facebook and Instagram, as well through WhatsApp and emails.

The dependent variable in the study was anxiety symptoms that were screened using the Depression, Anxiety and Stress Scale-21 (DASS-21), which employs the symptomatology approach to screen for psychological symptoms, but is not used for a thorough diagnosis.²² The anxiety subscale of DASS-21 has superlative psychometric properties, with Cronbach alpha 0.89 indicating excellent internal consistency, convergent and concurrent validities.²⁴ The scale has been previously used and validated in the Pakistani population.²⁵

All items were scored on a 4-point Likert scale, with 0=it does not apply to me at all, 1=it applies to me to some degree or some of the time, 2=it applies to me to a considerable degree or a good part of the time, and 3=it applies to me very much, or most of the time. Summation

Table-1: Baseline characteristics of the participants as per the degree of anxiety symptoms.

Characteristics	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Extreme n (%)	p-value
Internet Addiction amidst COVID-19 ((Internet addiction test [IAT])	454 (39.7)	109 (9.5)	242 (21.1)	83 (7.2)	257 (22.5)	<0.001
NIU	350 (77.1)	83 (76.2)	156 (64.5)	34 (41.0)	80 (31.1)	
PIU	80 (17.6)	22 (20.2)	67 (27.7)	39 (47.0)	105 (40.9)	
AIU	24 (5.3)	4 (3.7)	19 (7.9)	10(12.1)	72 (28.0)	
Socio-demographic factors						0.49
Age (years)*	24.35(7.67)	24.56(7.89)	23.40(6.59)	23.67(8.41)	23.96(6.83)	
Gender						0.103
Male	193(42.5)	46 (42.2)	97 (40.1)	38(45.8)	85(33.1)	
Female	261(57.5)	63(57.8)	145 (59.9)	45(54.2)	172(66.9)	
Social class						0.23
Lower	51 (11.2)	12(11.0)	16(6.6)	2(2.4)	20 (7.8)	
Middle	239 (52.6)	59 (54.1)	135(55.8)	47(56.6)	136(52.9)	
Upper	164 (36.1)	38(34.9)	91(37.6)	34(41.0)	101(39.3)	
Marital status						0.25
Never Married	368 (81.1)	86 (78.9)	211 (87.2)	68(81.9)	211(82.1)	
Ever Married	86 (18.9)	23 (21.1)	31 (12.8)	15(18.1)	46(17.9)	
Family income						0.03
0-50 k	146 (32.2)	37 (33.9)	72 (29.8)	17 (20.5)	55 (21.4)	
50-100 k	85 (18.7)	23 (21.1)	57 (23.6)	18 (21.7)	46 (17.9)	
100-200 k	79 (17.4)	18 (16.5)	49 (20.3)	18 (21.7)	55 (21.4)	
More than 200 k	144 (31.7)	31 (28.4)	64 (26.5)	30 (36.1)	101 (39.3)	
Area of living						0.019
Rural	72 (15.9)	20 (18.4)	38 (15.7)	18(21.7)	26(10.1)	
Suburban	52 (11.5)	18 (16.5)	36 (14.9)	11(13.3)	53(20.6)	
Urban	330 (72.7)	71 (65.1)	168 (69.4)	54(65.1)	178(69.3)	
Behavioral and environmental factors during pandemic						
Family conflicts during pandemic						<0.001
No	308 (67.8)	63 (57.8)	120(49.6)	39(47.0)	108(42.0)	
Yes	146 (32.2)	46 (42.2)	122 (50.4)	44(53.0)	149(58.0)	
Experienced any form of mental, physical, or sexual abuse during the pandemic						<0.001
fNo	387 (85.2)	76 (69.7)	176(72.7)	63(75.9)	162(63.0)	
Yes	67 (14.8)	33 (30.3)	66 (27.3)	20(24.1)	95(37.0)	
Workload during pandemic						0.018
Not working	173 (38.1)	35 (32.1)	73(30.2)	29(34.9)	80(31.1)	
Higher than before	71 (15.6)	23 (21.1)	50 (20.7)	17(20.5)	65(25.3)	
High variable	31(6.8)	15 (13.8)	25 (10.3)	9(10.8)	32(12.5)	
Less than before	106 (23.4)	23 (21.1)	58(24.0)	12(14.5)	39(15.2)	
Same as before	73 (16.1)	13 (11.9)	36 (14.9)	16(19.3)	41(16.0)	
Health related factors						
Currently suffering from mental problem						<0.001
No	290 (63.9)	52 (47.7)	123(50.8)	35(42.2)	77(30.0)	
Yes	86 (18.9)	30 (27.5)	72 (29.8)	26(31.3)	128(49.8)	
I don't know	78 (17.2)	27 (24.8)	47 (19.4)	22(26.5)	52(20.2)	
Mood changes during COVID						<0.001
Negative	189 (41.6)	53(48.6)	129(53.3)	54(65.1)	170(66.2)	
No change	172 (37.9)	31 (28.4)	55 (22.7)	16(19.3)	34(13.2)	
Positive	93(20.5)	25(22.9)	58(24.0)	13(15.7)	53(20.6)	
Family members suffering from mental problem during COVID						<0.001
No	371 (81.7)	79 (72.5)	159 (65.7)	54(65.1)	156(60.7)	
Yes	52 (11.5)	26 (23.9)	54 (22.3)	17(20.5)	71(27.6)	
I don't know	31 (6.8)	4 (3.7)	29 (12.0)	12(14.5)	30(11.7)	

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Table-1: Continued from previous page.

Characteristics	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Extreme n (%)	p-value
	454 (39.7)	109 (9.5)	242 (21.1)	83 (7.2)	257 (22.5)	
Family history of mental problem						<0.001
No	339 (74.7)	64 (58.7)	136 (56.2)	55 (66.3)	138 (53.7)	
Yes	75 (16.5)	30 (27.5)	73 (30.2)	16 (19.3)	70 (27.2)	
I don't know	40 (8.8)	15 (13.8)	33 (13.6)	12 (14.5)	49 (19.1)	
Currently suffering from Chronic illness						<0.001
No	41 (9.0)	15 (13.8)	33 (13.6)	10 (12.1)	43 (16.7)	
Yes	17 (3.7)	9 (8.3)	13 (5.4)	7 (8.4)	38 (14.8)	
I don't know	396 (87.2)	85 (78.0)	196 (81.0)	66 (79.5)	176 (68.5)	

*Mean(Standard Deviation), COVID-19: Coronavirus disease-2019, NIU: Normal internet users, PIU: Problematic internet users, AIU: Addictive internet users.

of items 2, 4, 7, 9, 15, 19, 20 and then multiplying the sub-total by 2 gave the anxiety score, ranging 0-42. The scores were categorised as normal=0-7, mild=8-9, moderate=10-14, severe=15-19 and extremely severe=20 and above.

Independent variables internet addiction was assessed using Young's Internet Addiction Test (IAT), which has been used and validated in the Pakistani population, showing excellent convergent validity and internal consistency with Cronbach alpha 0.88.^{26,27}

The 20 IAT items were scored on a 6-point Likert scale, with 0=not applicable, 1=rarely, 2=occasionally, 3=frequently, 4=often and 5=always. The total score ranged 0-100, with 0-39=normal internet users (NIUs), 40-69=problematic internet users (PIUs), and 70 and above=addictive internet users (AIUs).

Other independent variables included sociodemographic factors, family and medical history, and behavioural and environmental factors related to COVID-19.

Data was analysed using STATA 16. Mean and standard deviations were reported for continuous quantitative variables, and frequencies and percentages were reported for categorical variables. Multinomial regression was used to determine associated factors of anxiety, and odds ratios (ORs) along with 95% confidence intervals (CIs) were reported. $P < 0.05$ was considered statistically significant.

Results

Of the 1,145 subjects, 686(60%) were females and 459(40%) were males. There were 454(39.7%) subjects with no anxiety, 109(9.5%) had mild anxiety, 242(21.1%) had moderate, 83(7.2%) had severe, and 257(22.5%) had extremely severe anxiety. Internet usage pattern among NIUs, PIUs and AIUs was significantly associated with the level of anxiety ($p < 0.05$). Age, gender, social class and marital status were not significantly different ($p > 0.05$), while family income and area of living were significantly different ($p < 0.05$) in terms of anxiety levels. Behavioural, environmental and health-related factors were also significantly different (Table 1). The odd of addictive

internet use was 10.2 (95% confidence interval: 5.7-18.5) times greater in individuals with extreme anxiety compared to individuals having no anxiety after controlling for other sociodemographic, health-related, behavioural and environmental factors during the pandemic (Table 2).

Discussion

About 30% of the participants in the current study showed severe to extremely severe anxiety levels, indicating an increase in anxiety levels among Pakistani population during the COVID-19 pandemic. This coincides with several studies done in China, Turkey and Mexico.^{12,28-30} A systematic review and meta-analysis of 17 studies also revealed that anxiety levels during the pandemic had increased to about 32%.³¹

Internet addiction was found to be one of the significant factors associated with anxiety levels in the present study, which is consistent with literature.^{32,33} Moreover, lockdowns during the pandemic contributed markedly in increased usage of internet^{34,35} which could possibly explain high anxiety levels in the population in general.²⁹

The current study also found that females experienced higher levels of anxiety than males. This finding was supported by a study in Saudi Arabia.³⁶

Another important finding of the current study was that people suffering from mental problems or chronic illness had greater anxiety levels. People with pre-existing mental health problems or with any other chronic illness found it especially difficult to deal with the pandemic. Evidence from a meta-analysis demonstrated an increased risk of fatal COVID-19 among patients with a pre-existing mental disorder³⁷ and this fear could be the possible explanation of higher anxiety levels among them.

A major strength of the current study is that it was conducted during the peak phase of COVID-19. Additionally, an adequate and large sample size was obtained due to the usage of validated tools and easy-access survey distributed through social media.

Table-2: Predictors of different levels of anxiety..

Variables	Mild Adjusted OR(95%CI)	Moderate Adjusted OR(95%CI)	Severe Adjusted OR(95%CI)	Extremely Severe Adjusted OR(95%CI)
Internet Addiction during pandemic (Internet addiction test [IAT])				
PIU	1.1 (0.6-1.9)	1.8 (1.2- 2.7)	4.9 (2.8- 8.5)	5.5 (3.6- 8.3)
AIU	0.6 (0.2-1.7)	1.4 (0.7- 2.8)	3.5 (1.5- 8.3)	10.2 (5.7-18.5)
Socio-demographic factors				
Gender				
Female	1.1 (0.7- 1.7)	1.1 (0.8- 1.5)	0.9 (0.5- 1.4)	1.8 (1.2- 2.6)
Social class				
Middle class	1.2 (0.6- 2.6)	2.2 (1.2- 4.3)	5.1 (1.1- 22.9)	1.4 (0.7- 2.7)
High Class	1.4 (0.6- 3.3)	2.7 (1.3- 5.5)	5.1 (1.1- 24.4)	1.3 (0.6- 2.7)
Marital Status				
Never Married	0.9 (0.5- 1.6)	1.7 (1.1- 2.8)	1.0 (0.5- 1.9)	1.0 (0.6- 1.7)
Area of living				
Rural	1.4 (0.8- 2.6)	1.2 (0.7- 1.9)	2.0 (1.0- 3.9)	1.0 (0.6- 1.8)
Sub urban	1.6 (0.8- 3.0)	1.3 (0.8- 2.1)	1.1 (0.5- 2.4)	1.8 (1.1- 3.0)
Income				
0-50 k	1.2 (0.6- 2.4)	1.5 (0.9- 2.5)	0.8 (0.3- 1.7)	0.8 (0.5- 1.4)
50-100 k	1.4 (0.7- 2.7)	1.7 (1.0- 2.9)	1.0 (0.4- 2.1)	0.9 (0.5- 1.5)
100-200 k	1.1 (0.6- 2.2)	1.7 (1.0- 2.8)	1.3 (0.6- 2.6)	1.1 (0.7- 1.9)
Health-related factors				
Currently suffering from mental problem				
Yes	1.4 (0.8- 2.4)	1.2 (0.8- 1.8)	1.7 (0.9- 3.3)	3.2 (2.0- 5.0)
I don't know	1.6 (0.9-2.9)	1.0 (0.6- 1.5)	1.4 (0.7- 2.8)	1.6 (1.0- 2.7)
Family members suffering from mental problem during COVID				
Yes	1.3 (0.6- 2.5)	1.4 (0.8- 2.3)	2.1 (0.9- 4.7)	1.8 (1.0- 3.2)
I don't know	0.2 (0.1- 0.7)	1.4 (0.7- 2.6)	2.2 (0.9- 5.6)	1.0 (0.5- 2.0)
Family history of mental problem				
yes	1.6 (0.8- 3.0)	1.7 (1.0- 2.8)	0.6 (0.3- 1.4)	0.92 (0.53- 1.59)
I don't know	2.2 (1.0- 4.6)	1.3 (0.7- 2.4)	0.6 (0.3- 1.6)	1.2 (0.7- 2.3)
Chronic illness (self)				
yes	1.7 (0.6- 5.0)	1.0 (0.4- 2.5)	1.7 (0.5- 5.8)	2.7 (1.1- 6.5)
I don't know	0.8 (0.4- 1.7)	0.8 (0.5- 1.4)	0.9 (0.4- 2.0)	0.7 (0.4- 1.3)
Behavioural and environmental factors during pandemic				
Mood changes during pandemic				
Negative feelings	1.3 (0.8- 2.1)	1.7 (1.1- 2.5)	1.8 (1.0- 3.5)	2.2 (1.4-3.6)
Positive Feelings	1.2 (0.7-2.3)	1.6 (1.0- 2.6)	1.1 (0.5- 2.5)	1.9 (1.1- 3.3)
Experienced any form of mental, physical, or sexual abuse during the pandemic				
Yes	2.1 (1.2- 3.7)	1.4 (0.9- 2.2)	1.1 (0.6- 2.2)	1.7 (1.1- 2.7)
Workload during pandemic				
Not currently working	1.1 (0.6- 2.2)	0.8 (0.5- 1.2)	1.4 (0.7- 3.1)	1.3 (0.7- 2.2)
Higher than before containment	1.6 (0.8- 3.2)	1.2 (0.7- 2.1)	2.1 (0.9- 4.9)	2.4 (1.3- 4.3)
Highly variable and unpredictable	2.4 (1.1- 5.4)	1.2 (0.6- 2.3)	2.1 (0.7- 5.7)	2.2 (1.1- 4.6)
Same as before containment	0.9 (0.4- 1.9)	1.0 (0.6- 1.7)	2.3 (1.0- 5.5)	1.8 (1.0- 3.4)
Family conflicts during pandemic				
Yes	0.9 (0.5- 1.5)	1.5 (1.0- 2.2)	1.8 (1.1- 3.2)	1.4 (0.9- 2.1)

OR: Odds ratio, CI: Confidence interval.

The current study has some limitations. As it was an internet-based survey, the sample, therefore, may not be representative of the entire population. Moreover, data was collected using a self-administered tool, and the anxiety levels may not be compatible with the formal confirmatory diagnosis by a mental health professional. Also, the cross-sectional survey has a potential inherit bias as the outcome was assessed at one point in time. Any temporal or causal

association cannot be established, and a time trend analysis is recommended for future studies.

Conclusion

A significant association of anxiety was found with internet addiction during the COVID-19 pandemic. Relevant strategies, including counselling, should be curated to curb internet addiction as it can lead to mental health issues that might culminate into mental disorders.

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References

1. Pashazadeh Kan F, Raofi S, Rafiei S, Khani S, Hosseinifard H, Tajik F, et al. A systematic review of the prevalence of anxiety among the general population during the COVID-19 pandemic. *J Affect Disord* 2021;293:391-8. doi: 10.1016/j.jad.2021.06.073.
2. Pérez-Fuentes MDC, Molero Jurado MDM, Martos Martínez Á, Gázquez Linares JJ. Threat of COVID-19 and emotional state during quarantine: Positive and negative affect as mediators in a cross-sectional study of the Spanish population. *PLoS One* 2020;15:e0235305. doi: 10.1371/journal.pone.0235305.
3. Santabàrbara J, Lasheras I, Lipnicki DM, Bueno-Notivol J, Pérez-Moreno M, López-Antón R, et al. Prevalence of anxiety in the COVID-19 pandemic: An updated meta-analysis of community-based studies. *Prog Neuropsychopharmacol Biol Psychiatry* 2021; 109:110207. doi: 10.1016/j.pnpbp.2020.110207.
4. Elbay RY, Kurtulmuş A, Arpacioğlu S, Karadere E. Depression, anxiety, stress levels of physicians and associated factors in Covid-19 pandemics. *Psychiatry Res* 2020;290:113130. doi: 10.1016/j.psychres.2020.113130.
5. Hossain MM, Rahman M, Trisha NF, Tasnim S, Nuzhath T, Hasan NT, et al. Prevalence of anxiety and depression in South Asia during COVID-19: A systematic review and meta-analysis. *Heliyon* 2021;7:e06677. doi: 10.1016/j.heliyon.2021.e06677.
6. Grover S, Sahoo S, Mehra A, Avasthi A, Tripathi A, Subramanyan A, et al. Psychological impact of COVID-19 lockdown: An online survey from India. *Indian J Psychiatry* 2020;62:354-62. doi: 10.4103/psychiatry.IndianJPsychiatry_427_20.
7. Banna MHA, Sayeed A, Kundu S, Christopher E, Hasan MT, Begum MR, et al. The impact of the COVID-19 pandemic on the mental health of the adult population in Bangladesh: a nationwide cross-sectional study. *Int J Environ Health Res* 2022;32:850-61. doi: 10.1080/09603123.2020.1802409.

8. Imran N, Masood HMU, Ayub M, Gondal KM. Psychological impact of COVID-19 pandemic on postgraduate trainees: a cross-sectional survey. *Postgrad Med J* 2021;97:632-7. doi: 10.1136/postgradmedj-2020-138364.
9. Hasan SR, Hamid Z, Jawaid MT, Ali RK. Anxiety among Doctors during COVID-19 Pandemic in Secondary and Tertiary Care Hospitals. *Pak J Med Sci* 2020;36:1360-5. doi: 10.12669/pjms.36.6.3113.
10. Lakhdir MPA, Nathwani AA, Peerwani G, Azam SI, Iqbal R, Asad N. Burden and factors associated with Generalized Anxiety Disorder symptoms among the Pakistani population during the Corona-virus disease 2019. *Res Sq* 2021. doi: 10.21203/rs.3.rs-598605/v1. [Preprint].
11. Cheng P, Xia G, Pang P, Wu B, Jiang W, Li YT, et al. COVID-19 Epidemic Peer Support and Crisis Intervention Via Social Media. *Community Ment Health J* 2020;56:786-92. doi: 10.1007/s10597-020-00624-5.
12. Priego-Parra BA, Triana-Romero A, Pinto-Gálvez SM, Ramos CD, Salas-Nolasco O, Reyes MM, et al. Anxiety, depression, attitudes, and internet addiction during the initial phase of the 2019 coronavirus disease (COVID-19) epidemic: A cross-sectional study in México. *MedRxiv* 2020. doi: 10.1101/2020.05.10.20095844. [Preprint].
13. Dong H, Yang F, Lu X, Hao W. Internet Addiction and Related Psychological Factors Among Children and Adolescents in China During the Coronavirus Disease 2019 (COVID-19) Epidemic. *Front Psychiatry* 2020;11:e00751. doi: 10.3389/fpsy.2020.00751.
14. Young KS. Internet addiction: A new clinical phenomenon and its consequences. *Am Behav Sci* 2004;48:402-15. DOI: 10.1177/0002764204270278.
15. Jahan I, Hosen I, Al Mamun F, Kaggwa MM, Griffiths MD, Mamun MA. How Has the COVID-19 Pandemic Impacted Internet Use Behaviors and Facilitated Problematic Internet Use? A Bangladeshi Study. *Psychol Res Behav Manag* 2021;14:1127-38. doi: 10.2147/PRBM.S323570.
16. Li YY, Sun Y, Meng SQ, Bao YP, Cheng JL, Chang XW, et al. Internet Addiction Increases in the General Population During COVID-19: Evidence From China. *Am J Addict* 2021;30:389-97. doi: 10.1111/ajad.13156.
17. Lin MP. Prevalence of Internet Addiction during the COVID-19 Outbreak and Its Risk Factors among Junior High School Students in Taiwan. *Int J Environ Res Public Health* 2020;17:8547. doi: 10.3390/ijerph17228547.
18. Prakash S, Yadav JS, Singh TB. An online cross-sectional study to assess the prevalence of internet addiction among people staying at their home during lockdown due to COVID-19. *Int J Indian Psychol* 2020;8:424-32. DOI: 10.25215/0803.052.
19. Fernandes B, Biswas UN, Mansukhani RT, Casarín AV, Essau CA. The impact of COVID-19 lockdown on internet use and escapism in adolescents. *Revista de psicología clínica con niños y adolescentes* 2020;7:59-65.
20. Servidio R, Bartolo MG, Palermi AL, Costabile A. Fear of COVID-19, depression, anxiety, and their association with Internet addiction disorder in a sample of Italian students. *J Affect Disord Rep* 2021;4:100097. doi: 10.1016/j.jadr.2021.100097
21. Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatry* 2020;7:547-60. doi: 10.1016/S2215-0366(20)30168-1.
22. Dean AG, Sullivan KM, Soe MM. OpenEpi: Open Source Epidemiologic Statistics for Public Health, Version 3.01. [Online] 2013 [Cited 2023 November 13]. Available from URL: http://www.openepi.com/Menu/OE_Menu.htm
23. Lakhdir MPA, Hameed AN, Hasnani FB, Angez M, Nawaz MT, Khan MMH, et al. Demographic and Psychosocial Factors associated with Internet Addiction among the Pakistani Population during COVID-19: A Web-Based Survey. *Inquiry* 2022;59:469580221138671. doi: 10.1177/00469580221138671.
24. Coker AO, Coker OO, Sanni D. Psychometric properties of the 21-item depression anxiety stress scale (DASS-21). *Afr Res Rev* 2018;12:135-42.
25. Bibi A, Lin M, Zhang XC, Margraf J. Psychometric properties and measurement invariance of Depression, Anxiety and Stress Scales (DASS-21) across cultures. *Int J Psychol* 2020;55:916-25. doi: 10.1002/ijop.12671.
26. Ndasauka Y, Pitafi A, Kayange GM. Psychometric properties of Young's Internet Addiction Test (IAT) in Urdu language. *Asian J Psychiatr* 2019;40:39-44. doi: 10.1016/j.ajp.2019.01.011.
27. Waqas A, Farooq F, Raza M, Javed ST, Khan S, Ghumman ME, et al. Validation of the Internet Addiction Test in Students at a Pakistani Medical and Dental School. *Psychiatr Q* 2018;89:235-47. doi: 10.1007/s1126-017-9528-5.
28. Özdin S, Bayrak Özdin Ş. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *Int J Soc Psychiatry* 2020;66:504-11. doi: 10.1177/0020764020927051.
29. Li J, Yang Z, Qiu H, Wang Y, Jian L, Ji J, et al. Anxiety and depression among general population in China at the peak of the COVID-19 epidemic. *World Psychiatry* 2020;19:249-50. doi: 10.1002/wps.20758.
30. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. *Int J Environ Res Public Health* 2020;17:1729. doi: 10.3390/ijerph17051729.
31. Salari N, Hosseinian-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Global Health* 2020;16:57. doi: 10.1186/s12992-020-00589-w.
32. Akin A, Iskender M. Internet addiction and depression, anxiety and stress. *Int Online J Educ Sci* 2011;3:138-48.
33. Weinstein A, Lejoyeux M. Internet addiction or excessive internet use. *Am J Drug Alcohol Abuse* 2010;36:277-83. doi: 10.3109/00952990.2010.491880.
34. Dwivedi YK, Hughes DL, Coombs C, Constantiou I, Duan Y, Edwards JS, et al. Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *Int J Inf Manag* 2020;55:102211.
35. King DL, Delfabbro PH, Billieux J, Potenza MN. Problematic online gaming and the COVID-19 pandemic. *J Behav Addict* 2020;9:184-6. doi: 10.1556/2006.2020.00016.
36. Albagmi FM, AlNujaidi HY, Al Shawan DS. Anxiety Levels Amid the COVID-19 Lockdown in Saudi Arabia. *Int J Gen Med* 2021;14:2161-70. doi: 10.2147/IJGM.S312465.
37. Toubasi AA, AbuAnzeh RB, Tawileh HBA, Aldebei RH, Alryalat SAS. A meta-analysis: The mortality and severity of COVID-19 among patients with mental disorders. *Psychiatry Res* 2021;299:113856. doi: 10.1016/j.psychres.2021.113856.

Author Contribution:

MPAL, MMHK, FBH, GP, MTN, ANH, MA, AAN, SIA: Literature search, study design and concept, questionnaire design, data collection, analysis, interpretation, drafting