

# Covid-19 pandemic-prevalence of depression, anxiety and insomnia during Covid-19 lockdown and its associated factors in Karachi, Pakistan

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**Abstract:** We aimed to determine the frequency of depression, anxiety and insomnia; identify associated factors; and compare these outcomes amongst a privileged and underprivileged class of Pakistan. A cross-sectional online and face to face survey was conducted in Karachi from April 2020 to May 2020. Validated depression (World Health Organization self-reporting questionnaire), anxiety (general anxiety and depression scale) and insomnia (insomnia severity index) scales were used. Out of 447 participants, the majority were less than 30 years (63.8%) and females (57.7%); 20.8% study participants belonged to poor or very poor socioeconomic status; 17% respondents were from lower middle status and 38% belonged to the higher middle or rich class. Depression, anxiety and insomnia were identified in 30%, 30.63% and 8.5% of participants, respectively. The prevalence of depression, anxiety and insomnia among privileged people was 37.8%, 16.6% and 11.3% respectively whereas among underprivileged were 17.8%, 16.6% and 4.1% respectively. There were significant differences in frequencies of depression ( $p<0.001$ ), anxiety ( $p<0.001$ ) and insomnia ( $p=0.009$ ) among the privileged and underprivileged classes. We found a high prevalence of depression, anxiety and insomnia among both the privileged and underprivileged Pakistani population and a policy needs to be devised to ensure the mental health of Pakistani population.

**Keywords:** COVID-19, pandemic, depression, anxiety, insomnia, lockdown, Pakistan.

## INTRODUCTION

The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a global pandemic and has become a major public health burden worldwide. The virus originated in Wuhan, China in December 2019 (Li *et al.*, 2020). Within a month, this epidemic spread in more than two hundred countries and was thereby declared as “Pandemic” by World Health Organization (WHO) (WHO, 2020). In Pakistan, the first case of COVID-19 was reported on 26<sup>th</sup> February and to prevent the virus spread, the Pakistani government imposed a lockdown with travel restrictions countrywide on 24<sup>th</sup> March (Waris *et al.*, 2020).

Significant psychiatric morbidities have been reported during epidemic situations (Sim *et al.*, 2010). Recent reports from different countries have reported moderate-to-severe anxiety among their population during COVID-19 outbreak (Huang & Zhao, 2020; Moghanibashi-Mansourieh, 2020). Different factors could attribute to these effects including feelings of helplessness, fear of

contracting the disease and the stigma associated with contracting the disease. In developing countries such as Pakistan, the impact could be even greater during the lockdown as it is likely to further raise the economic burden for both the middle and poor social strata. With economic and cultural dynamics being entirely different for Pakistan, psychological resilience may be marked and identification of associated factors could help our policymakers to develop strategies to reduce psychological impacts during the pandemic. Hence, the current study was aimed to assess the impact of lockdown anxiety, depression and insomnia during the COVID-19 outbreak and identify associated factors. We also aimed to compare mental health outcomes amongst the privileged and underprivileged classes.

## MATERIALS AND METHODS

We conducted a cross-sectional face-to-face and online survey. The survey was conducted for 30 days from April, 2020 to May, 2020 until strict lockdown was lifted by the government. The survey was disseminated through social media groups on social networking sites. In addition to this, a face-to-face survey was conducted from people

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living in two sub-urban settlements (Sherpao Basti and Hijrat Colony) with no access to the internet and social media.

Frontline physicians, healthcare workers dealing directly with covid patients, current or past COVID infection, pregnant women, children below 18 years of age and those with terminal illness were excluded. NCSS PASS software version 11 was used for sample size calculation. We considered a prevalence of depression among males and females as 5.5% and 3.2% respectively with gender significantly associated with depression/anxiety (Cyranowski *et al.*, 2000; Patten *et al.*, 2006). Therefore, with a 5% probability of type 1 error and power of 80%, with an odds ratio worth detecting of 2.0, the sample size was calculated as at least 385. To account for non-participation and incomplete surveys, we approached 450 participants.

The study questionnaire comprised of eight different sections. The first section was a written consent. Rest of the sections included socio-demographic factors with 13 items, the impact of COVID-19 on their income (11 items), health status and symptoms (5 items), history of contact with COVID-19 confirmed cases (5 items) and fear regarding COVID-19 with two items. Subsequent components of the questionnaire comprised of validated depression/anxiety and insomnia scale including World Health Organization self-reporting questionnaire (WHO SRQ-20), general anxiety and depression scale (GAD-7) and insomnia severity index (ISI).

A threshold of 8 or above on SRQ-20 was considered as a positive case of depression. For GAD-7, scores of 0-4 were labeled as normal, 5-9 as mild, 10-14 as moderate, and 15-21 as severe (Sapra, Bhandari, Sharma, Chanpura, & Lopp, 2020). In ISI scoring, participants were considered as normal, sub-threshold, moderate and severe for scores of 0-7, 8-14, 15-21 and 22-28, respectively. For determining the association of depression with socio-demographic factors, the threshold was taken as 5 and 10 for GAD-7 and ISI scales respectively to label patients as a positive case.

#### **Ethical approval**

The study protocol was approved by BHU ERC committee with approval number: BHU-ERC/Pharmacy-002/2020/PI-Dr. Amber Hanif Palla.

## **STATISTICAL ANALYSIS**

Data was analyzed on SPSS version 21. Frequencies and proportions were computed for categorical variables. Univariable analysis and Chi-square/Fisher-exact test were used to determine the association of socio-demographic factors with depression, anxiety and

insomnia. P-value less than 0.05 was considered statistically significant.

## **RESULTS**

### ***Socio-demographic characteristics of participants***

A total of 447 responses were received and analyzed. Participants' socio-demographic characteristics are depicted in table 1. The majority of the study participants were aged less than 30 years (63.8%), females (58%), students (42.7%), married (67.8%), had a total no. of household members less than or equal to 5 (49%), having children less than or equal to 5 (55.3%), reported having an elderly family member in their household (40%), said that maids/servants were not coming to their houses during lockdown (61.1%). 20.8% of study participants belonged to poor or very poor socioeconomic status. 17% respondents were from lower middle status and 38% belonged to the higher middle or rich class (table 1).

### ***Depression and its correlates using SRQ-20***

Among 447 participants, depression through SRQ-20 scale was identified in 30%. On univariate analysis (table 2), depression was significantly higher among the age group  $\leq 30$  years, females, privileged class, people who thought their health is poor or average, people tested for COVID-19, history of close with COVID-19 case, people who had no idea for the likelihood of contracting the disease, who presumed that it was not likely to survive once infected and people who reported servants were coming to their home during the pandemic (table 2).

### ***Anxiety on GAD-7 and correlates***

The overall frequency of anxiety was 30.63% with mild, moderate and severe anxiety among 94 (21%), 26 (5.8%), 16 (3.6%) respectively. The prevalence of anxiety using the threshold of 10 or above on GAD-7 scale was 9.4%. Female gender, no. of households, social class, socioeconomic status and perception regarding the likelihood of disease contraction with anxiety (table 2).

### ***Insomnia Severity Index (ISI) for Insomnia***

Using the cut-off value of 15 or above, clinical insomnia was observed in 8.5% of participants. Using the cut-off value of 7, the overall prevalence was 39.4%. The frequency of sub threshold, moderate and severe insomnia was 137 (30.6%), 34 (7.6%) and 4 (0.9%), respectively.

Insomnia was significantly associated with social class, socioeconomic status, self-perception of health and history of contact with COVID-19 (table 2).

### ***Depression, anxiety and insomnia among privileged and underprivileged groups and associated factors***

The prevalence of depression using SRQ-20 scale among privileged people was 37.8% as compared to 17.8% among the underprivileged participants.

**Table 1:** Socio-demographic characteristics of participants

Variables	Groups	Frequency (%)
Age	≤30 years	285(63.8)
	31-59 years	152 (33.8)
	≥60 years	7(1.6)
	Missing	4(0.9)
Gender	Male	187(42)
	Female	258(58)
	Missing	2(0.4)
Student	Yes	191(42.7)
	No	256(57.3)
Marital status	Married	303(67.8)
	Single	125(28)
	Divorce/separate	11(2.5)
	Widowed	5(1.1)
	Missing	3(0.7)
How many household members do you have?	≤5	215(49)
	>5	225(51)
	Missing	7(0.2)
How many children under twelve years old are in your household?	≤5	247(55.3)
	>5	163(36.5)
	None	37(8.3)
How many people in your household are aged between 12 to 60 years old?	≤5	287(64.2)
	>5	149(33.3)
	Missing	11(2.5)
How many people in the household are aged 61 or above?	≤5	179(40)
	>5	174(39)
	None	94(21)
Socio economic status	Very poor/poor	93(20.8)
	Lower middle	76(17)
	Middle	105(23.5)
	higher middle/rich	170(38)
	Missing	3(0.7)
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Yes	174(38.9)
	No	273(61.1)

In the privileged group, depression was significantly higher among the age group ≤30 years and elderly, females, people not having good health, people not tested for COVID positive, people who did not have the perception of surviving if infected with COVID-19 (table 3).

Among underprivileged people, depression was significantly higher in females, people not having good health, people who were unsure regarding their contact with COVID-19, people who had no idea whether they could contract the disease, people who did not have the perception of surviving if infected with COVID-19, people who were allowing maids to visit their home in the past 14 days (table 4).

The prevalence of anxiety among privileged people was 9.1% (cut-off score 10). Using the threshold for mild-moderately severe on GAD-7 scale, the overall prevalence

of anxiety was 38.9% (cut off 5). Mild, moderate and severe anxiety were found among 29.8%, 5.1% and 4% of participants respectively. None of the study variables were significantly associated with anxiety among privileged participants.

In the cohort of underprivileged people, the frequency of mild, moderate and severe anxiety was 7.1%, 12.7.1% and 16.6% respectively. None of the participants' characteristics were found to be significantly associated with anxiety among participants.

In the group of privileged people, the frequency of sub-threshold, moderate, and severe insomnia was 52% while moderate and severe insomnia was prevalent in 11.3% of participants only. There was no association of insomnia with any of the study variables among privileged people (table 3).

**Table 2:** Association of socio-demographic factors with Depression, Anxiety and Insomnia

Study Variables	Groups	Depression			Anxiety			Insomnia		
		Yes n (%)	No n (%)	p-value	Yes n (%)	No n (%)	p-value	Yes n (%)	No n (%)	p-value
Age	≤30 years	102(35.8)	183(64.2)	†**0.001	90(31.6)	195(68.4)	†0.553	30(10.5)	255(89.5)	0.124
	31-59 years	31(19.7)	122(80.3)		43(28.3)	109(71.7)		8(5.3)	144(94.7)	
	≥60 years	2(28.6)	5(71.4)		1(14.3)	6(85.7)		0(0)	7(100)	
Gender	Male	27(14.4)	160(85.6)	**<0.001	46(24.6)	141(75.4)	*0.031	12(6.4)	175(93.6)	0.173
	Female	107(41.5)	151(58.5)		88(34.1)	170(65.9)		26(10.1)	232(89.9)	
Marital status	Single	29(23.2)	96(76.8)		40(32)	85(68)		7(5.6)	118(94.4)	
	Married	100(33)	203(67)	0.132	92(30.4)	211(69.6)	0.555	30(9.9)	273(90.1)	0.332
No. of households	Divorced/widow	5(31.2)	11(68.8)		3(18.8)	13(81.3)		1(6.3)	15(93.8)	
	≤5	64(29.8)	151(70.2)	0.921	74(34.4)	141(65.6)	*0.048	18(8.4)	197(91.6)	0.978
Social class	>5	66(29.3)	159(70.7)		58(25.8)	167(74.2)		19(8.4)	206(91.6)	
	Privileged underprivileged	104(37.8)	171(62.2)	**<0.001	107(38.9)	168(61.1)	**<0.001	31(11.3)	244(88.7)	**0.009
Socio economic status	30(17.8)	139(82.2)		28(16.6)	141(83.4)		7(4.1)	162(95.9)		
	Very poor/poor	5(5.4)	88(94.6)		10(10.8)	83(89.2)		1(1.1)	92(98.9)	
Please rate your physical health status	Lower middle	25(32.9)	51(67.1)	**<0.001	18(23.7)	58(76.3)	**<0.001	6(7.9)	70(92.1)	**0.007
	Middle	36(34.3)	69(65.7)		41(39)	64(61)		8(7.6)	97(92.4)	
Do you have any chronic medical illness	Higher middle/rich	68(40)	102(60)		66(38.8)	104(61.2)		23(13.5)	147(86.5)	
	Very good/good	48(16.9)	236(83.1)	**<0.001	81(28.5)	203(71.5)	†0.629	16(5.6)	268(94.4)	*0.010
Have you been tested for COVID-19?	Average	81(54)	69(46)		49(32.7)	101(67.3)		21(14)	129(86)	
	Poor/very poor	5(83.3)	1(16.7)	0.867	2(33.3)	4(66.7)	0.140	1(16.7)	5(83.3)	†0.154
Have you had close contact with an individual with confirmed COVID-19 in the past 2 weeks?	Yes	8(28.6)	20(71.4)	**0.005	12(42.9)	16(57.1)	†0.083	0(0)	28(100)	†0.010
	No	126(30.1)	293(69.9)		124(29.6)	295(70.4)		38(9.1)	381(90.9)	
How satisfied are you with the amount of health information available about COVID-19?	Yes	0(0)	18(100)	0.091	2(11.1)	16(88.9)	0.712	1(5.6)	17(94.4)	†0.078
	No	134(31.2)	295(68.8)		134(31.2)	295(68.8)		37(8.6)	392(91.4)	
What is the likelihood of you contracting COVID19 during the current outbreak?	Yes	0(0)	5(100)	**<0.001	3(60)	2(40)	†0.083	1(20)	4(80)	†0.380
	No	106(27.2)	284(72.8)		112(28.7)	278(71.3)		27(6.9)	363(93.1)	
What is the likelihood of surviving if infected with COVID-19?	Not sure	28(53.8)	24(46.2)		21(40.4)	31(59.6)		10(19.2)	42(80.8)	
	Very likely	89(29.7)	211(70.3)	0.091	95(31.7)	205(68.3)	0.712	25(8.3)	275(91.7)	†0.078
How has COVID - 19 affected your income?	Somewhat satisfied	18(23.1)	60(76.9)		19(24.4)	59(75.6)		4(5.1)	74(94.9)	
	Not very satisfied	5(50)	5(50)	**0.004	4(40)	6(60)	**0.026	0(0)	10(100)	0.380
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Not satisfied at all	17(44.7)	21(55.3)		11(28.9)	27(71.1)		8(21.1)	30(78.9)	
	Don't know	5(23.8)	16(76.2)		7(33.3)	14(66.7)		1(4.8)	20(95.2)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Very likely	20(18)	91(82)	**<0.001	22(19.8)	89(80.2)	0.187	5(4.5)	106(95.5)	0.754
	Somewhat likely	34(30.1)	79(69.9)		39(34.5)	74(65.5)		11(9.7)	102(90.3)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Not very likely	37(31.9)	79(68.1)	0.507	35(30.2)	81(69.8)	0.094	11(9.5)	105(90.5)	†0.843
	Don't know	43(40.2)	64(59.8)		40(37.4)	67(62.6)		11(10.3)	96(89.7)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Very likely	32(22.9)	108(77.1)	**<0.001	35(25)	103(75)	0.056	9(6.4)	131(93.6)	0.143
	Somewhat likely	55(29.1)	134(70.9)		61(32.3)	128(67.7)		18(9.5)	171(90.5)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Not very likely	23(59)	16(41)		10(25.6)	29(74.4)		4(10.3)	35(89.7)	
	Don't know	24(30.4)	55(69.6)		30(38)	49(62)		7(8.9)	72(91.1)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Strongly	65(30.7)	147(69.3)	0.507	23(32.4)	48(67.6)	0.094	18(8.5)	194(91.5)	†0.843
	Less strongly	18(25.4)	53(74.6)		3(11.1)	24(88.9)		7(9.9)	64(90.1)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Moderately	5(18.5)	22(81.5)		16(42.1)	22(57.9)		1(3.7)	26(96.3)	
	Mildly	13(34.2)	25(65.8)		16(42.1)	22(57.9)		2(5.3)	36(94.7)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Not affected	33(33.3)	66(66.7)	**<0.001	27(27.3)	72(72.7)	0.056	10(10.1)	89(89.9)	0.143
	Yes	71(40.8)	103(59.2)		62(35.6)	112(64.4)		19(10.9)	155(89.1)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	No	63(23.1)	210(76.9)		74(27.1)	199(72.9)		19(7)	254(93)	

†Fisher-exact test is reported; \*\*Significant at p<0.01, \*Significant at p<0.05

**Table 3:** Association of factors with Depression, Anxiety and Insomnia among privileged participants

Study Variables	Groups	Depression		p-value	Anxiety		p-value	Insomnia		p-value
		Yes N (%)	No N (%)		Yes N (%)	No N (%)		Yes N (%)	No N (%)	
Age	≤30 years	82(44.3)	103(55.7)	†**0.002	72(38.9)	113(61.1)	†0.368	24(13)	161(87)	†0.573
	31-59 years	20(23.5)	65(76.5)		34(40)	51(60)		7(8.2)	78(91.8)	
	>60 years	2(50)	2(50)		0(0)	4(100)		0(0)	4(100)	
Gender	Male	19(21.6)	69(78.4)	**<0.001	31(35.2)	57(64.8)	0.419	10(11.4)	78(88.6)	0.986
	Female	85(45.7)	101(54.3)		75(40.3)	111(59.7)		21(11.3)	165(88.7)	
Marital status	Single	21(27.6)	55(72.4)	0.069	30(39.5)	46(60.5)	0.486	6(7.9)	70(92.1)	0.466
	Married	79(42.5)	107(57.5)		74(39.8)	112(60.2)		24(12.9)	162(87.1)	
	Divorced/widow	4(30.8)	9(69.2)		3(23.1)	10(76.9)		1(7.7)	12(92.3)	
No. of households	≤5	48(37.2)	81(62.8)	0.973	61(43.9)	78(56.1)	0.057	16(11.5)	123(88.5)	0.864
	>5	42(25.6)	122(74.4)		42(32.6)	87(67.4)		14(10.9)	115(89.1)	
	average	58(56.9)	44(43.1)	†**<0.001	38(37.3)	64(62.7)	†0.789	16(15.7)	86(84.3)	†0.119
Please rate your physical health status	Poor/very poor	4(100)	0(0)		2(50)	2(50)		1(25)	3(75)	
	Yes	8(32)	17(68)	0.529	11(44)	14(56)	0.584	0(0)	25(100)	†0.090
Do you have any chronic medical illness	No	96(38.4)	154(61.6)		96(38.4)	154(61.6)		31(12.4)	219(87.6)	
	Yes	0(0)	7(100)	*0.047	2(28.6)	5(71.4)	†0.709	1(14.3)	6(85.7)	†0.571
Have you been tested for COVID-19?	No	104(38.8)	164(61.2)		105(39.2)	163(60.8)		30(11.2)	238(88.8)	
	Yes	0(0)	4(100)	†0.089	3(75)	1(25)	†0.052	1(25)	3(75)	†0.203
Have you had close contact with an individual with confirmed COVID-19 in the past 2 weeks?	No	86(36.6)	149(63.4)		85(36.2)	150(63.8)		24(10.2)	211(89.8)	
	Yes	18(50)	18(50)		19(52.8)	17(47.2)		6(16.7)	30(83.3)	
How satisfied are you with the amount of health information available about COVID-19?	Not sure	72(38.3)	116(61.7)		75(39.9)	113(60.1)		21(11.2)	167(88.8)	
	Somewhat satisfied	11(30.6)	25(69.4)		15(41.7)	21(58.3)		4(11.1)	32(88.9)	
	Not very satisfied	4(66.7)	2(33.3)	†0.411	2(33.3)	4(66.7)	0.865	0(0)	6(100)	†0.372
What is the likelihood of you contracting COVID19 during the current outbreak?	Not satisfied at all	13(43.3)	17(56.7)		9(30)	21(70)		6(20)	24(80)	
	Don't know	4(26.7)	11(73.3)		6(40)	9(60)		0(0)	15(100)	
	Very likely	14(31.8)	30(68.2)	0.726	16(36.4)	28(63.6)	0.386	4(9.1)	40(90.9)	0.950
How has COVID - 19 affected your income?	Somewhat likely	26(36.6)	45(63.4)		33(46.5)	38(53.5)		9(12.7)	62(87.3)	
	not very likely	30(38)	49(62)		26(32.9)	53(67.1)		9(11.4)	70(88.6)	
	Don't know	34(42)	47(58)		32(39.5)	49(60.5)		9(11.1)	72(88.9)	
What is the likelihood of surviving if infected with COVID-19?	Very likely	24(33.3)	48(66.7)	**0.008	23(31.9)	49(68.1)	0.267	7(9.7)	65(90.3)	0.845
	Somewhat likely	43(38.1)	70(61.9)		50(44.2)	63(55.8)		15(13.3)	98(86.7)	
	Not very likely	18(66.7)	9(33.3)		8(29.6)	19(70.4)		3(11.1)	24(88.9)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Don't know	19(30.2)	44(69.8)		26(41.3)	37(58.7)		6(9.5)	57(90.5)	
	Strongly	50(38.2)	81(61.8)		53(40.5)	78(59.5)		14(10.7)	117(89.3)	
	Less strongly	15(31.9)	32(68.1)	†0.094	20(42.6)	27(57.4)	0.387	6(12.5)	41(87.5)	†0.949
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	moderately	0(0)	8(100)		12(46.2)	14(53.8)		2(7.7)	24(92.3)	
	mildly	13(50)	13(50)		12(46.2)	14(53.8)		2(7.7)	24(92.3)	
	Not affected	26(41.3)	37(58.7)		21(33.3)	42(66.7)		8(12.7)	55(87.3)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Yes	58(42.6)	78(57.4)	0.102	55(40.4)	81(59.6)	0.606	16(11.8)	120(88.2)	0.799
	No	46(33.1)	93(66.9)		52(37.4)	87(62.6)		15(10.8)	124(89.2)	

\*\*Significant at p<0.01, \*Significant at P<0.05, † Fisher-exact test is reported

**Table 4:** Association of factors with Depression, anxiety and insomnia among underprivileged people

Study Variables	Groups	Depression			Anxiety			Insomnia		
		Yes N (%)	No N (%)	p-value	Yes N (%)	No N (%)	P- value	Yes N (%)	No n (%)	p-value
Age	≤30 years	20 (20.4)	78 (79.6)	†0.681	18 (18.4)	80 (81.6)	†0.278	6 (6.1)	92 (93.9)	†0.335
	31-59 years	10 (15.2)	56 (84.8)		8 (12.1)	58 (87.9)		1 (1.5)	65 (98.5)	
	≥60 years	0 (0)	3 (100)		1 (33.3)	2 (66.7)		0 (0)	3 (100)	
Gender	Male	8 (8.2)	90 (91.8)	**<0.001	14 (14.3)	84 (85.7)	0.456	2 (2)	96 (98)	†0.129
	Female	22 (31.4)	48 (68.6)		13 (18.6)	57 (81.4)		5 (7.1)	65 (92.9)	
Marital Status	Single	8 (16.7)	40 (83.3)	†0.659	10 (20.8)	38 (79.2)	†0.626	1 (2.1)	47 (97.9)	†0.714
	Married	21 (18.3)	94 (81.7)		17 (14.8)	98 (85.2)		6 (5.2)	109 (94.8)	
No. of households	Divorced/widow	1 (33.3)	2 (66.7)	†0.687	0 (0)	3 (100)	0.811	0 (0)	3 (100)	†0.465
	≤5	12 (16)	63 (84)		13 (17.3)	62 (82.7)		2 (2.7)	73 (97.3)	
Please rate your physical health status	>5	18 (19.1)	76 (80.9)	†**<0.001	15 (16)	79 (84)	†0.317	5 (5.3)	89 (94.7)	†0.051
	Very good/good average	6 (5.1)	111 (94.9)		16 (13.7)	101 (86.3)		2 (1.7)	115 (98.3)	
Do you have any chronic medical illness	Poor/very poor	1 (50)	1 (50)	†1.00	0 (0)	2 (100)	†0.421	0 (0)	2 (100)	†1.00
	Yes	0 (0)	3 (100)		1 (33.3)	2 (66.7)		0 (0)	3 (100)	
Have you been tested for COVID-19?	No	30 (18.1)	136 (81.9)	†0.216	27 (16.3)	139 (83.7)	†0.214	7 (4.2)	159 (95.8)	†1.00
	Yes	0 (0)	11 (100)		0 (0)	11 (100)		0 (0)	11 (100)	
Have you had close contact with an individual with confirmed COVID-19 in past 2 weeks?	No	30 (19)	128 (81)	†**<0.001	28 (17.7)	130 (82.3)	†1.00	7 (4.4)	151 (95.6)	†**0.002
	Yes	0 (0)	1 (100)		0 (0)	1 (100)		0 (0)	1 (100)	
How satisfied are you with the amount of health information available about COVID-19?	No	20 (13.1)	133 (86.9)	†0.152	26 (17)	127 (83)	0.188	3 (2)	150 (98)	†*0.025
	Not sure	10 (66.7)	5 (33.3)		2 (13.3)	13 (86.7)		4 (26.7)	11 (73.3)	
What is the likelihood of you contracting COVID19 during the current outbreak?	Very satisfied	17 (15.6)	92 (84.4)	*0.027	19 (17.4)	90 (82.6)	*0.017	4 (3.7)	105 (96.3)	†0.386
	Somewhat satisfied	7 (16.7)	35 (83.3)		4 (9.5)	38 (90.5)		0 (0)	42 (100)	
What is the likelihood of survival if infected with COVID-19?	Not very satisfied	1 (25)	3 (75)	†*0.024	2 (50)	2 (50)	†0.627	0 (0)	4 (100)	†0.464
	Not satisfied at all	4 (50)	4 (50)		2 (25)	6 (75)		2 (25)	6 (75)	
How has COVID - 19 affected your income?	Don't know	1 (16.7)	5 (83.3)	†0.388	1 (16.7)	5 (83.3)	†0.570	1 (16.7)	5 (83.3)	†0.934
	Very likely	6 (9.1)	60 (90.9)		5 (7.6)	61 (92.4)		1 (1.5)	65 (98.5)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Somewhat likely	8 (19)	34 (81)	**0.003	6 (14.3)	36 (85.7)	0.663	2 (4.8)	40 (95.2)	†0.178
	Not very likely	5 (45.5)	6 (54.5)		9 (25)	27 (75)		2 (5.6)	34 (94.4)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Don't know	5 (31.3)	11 (68.8)	†0.388	8 (32)	17 (68)	†0.570	2 (8)	23 (92)	†0.934
	Strongly	15 (19.2)	63 (80.8)		12 (17.6)	56 (82.4)		2 (2.9)	66 (97.1)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Less strongly	3 (12.5)	21 (87.5)	†0.388	10 (13.5)	64 (86.5)	†0.627	3 (4.1)	71 (95.9)	†0.464
	Moderately	5 (26.3)	14 (73.7)		2 (10.5)	17 (89.5)		0 (0)	19 (100)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Mildly	0 (0)	12 (100)	†0.388	4 (33.3)	8 (66.7)	†0.570	0 (0)	12 (100)	†0.934
	Not affected	7 (19.4)	29 (80.6)		6 (16.7)	30 (83.3)		2 (5.6)	34 (94.4)	
Do you have any maids or servants, who have been coming and going to your house in the past 14 days?	Yes	13 (35.1)	24 (64.9)	**0.003	7 (18.9)	30 (81.1)	0.663	3 (8.1)	34 (91.9)	†0.178
	No	17 (12.9)	115 (87.1)		21 (15.9)	111 (84.1)		4 (3)	128 (97)	

\*\*Significant at P<0.01, \*Significant at P<0.05, † Fisher-exact test is reported

## DISCUSSION

Our data indicate that there has been a rise in depression (30%) during COVID-19 lockdown as compared to earlier reported prevalence of anxiety and depressive symptoms in Karachi which was 27.4% (Farooq *et al.*, 2019). 23% depression prevalence was reported from a rural health facility in Lahore (Athar *et al.*, 2017). The current findings are consistent with the latest reports of depression in the other countries facing similar unknown health emergency crisis of COVID-19 pandemic. These include China (30%) (Ahmed *et al.*, 2020), and India (38.9%) (Kazmi *et al.*, 2020). However, some countries have reported even higher prevalence than our studies including China (prevalence of mental stress 53.5%) (Liu *et al.*, 2020), Spain (44.1%) (Odriozola-González *et al.*, 2020), and Iraq (44.9%) (Othman, 2020). The factors attributing to the rise in depression could be different in different countries due to differences in socioeconomic and cultural aspects.

We found anxiety level in 30.2% of people with a cut-off value of 5 and 9.15% people with a cut-off value of 10. The results on GAD-7 score of our study are consistent with the current pandemic situation of anxiety reported in Japan (11.4% with GAD-7 score >10) (Ueda *et al.*, 2020). However, depending on the threshold, these percentages vary among different countries ranging from 6.33% (Wang, Di, Ye, & Wei, 2020) to 44.6% (Liu *et al.*, 2020) in China, 32.4% in Spain (Odriozola-González *et al.*, 2020) and 49.6% in Norway (Agberotimi *et al.*, 2020). Surprisingly, anxiety data from Pakistan in pre and post-pandemic times do not reflect marked differences (22.5% in pre-pandemic times) (Bano *et al.*, 2019). This cannot be conclusive as the scoring tool used in these studies was different and we cannot find any specific comparative data for the Pakistani population in pre-pandemic settings for GAD score.

We found that insomnia was prevalent in 8.5% of the participants (with a cut-off of 15). This is consistent with recent reports from Italy (7.3% with a cut-off of 20) (Rossi *et al.*, 2020). With the sub threshold category included, the frequency of people reporting insomnia in our population is 39.41% (a cut-off of 10) whereas, in the Nigerian population the frequency of insomnia reported was 15.1% (with a cut-off of 5) (Agberotimi *et al.*, 2020).

We found that depression and insomnia were more pronounced in the privileged class. This is in contrast to reports from other countries, where low socioeconomic status was linked to depression and anxiety during the pandemic times (Wang *et al.*, 2020). One of the reasons for this could be that the underprivileged class was not as aware of the repercussions of COVID-19 as the privileged class and therefore were less concerned. In Pakistan, unlike other countries, there have been people who denied

the presence of COVID-19 and considered it a hoax owing to unverified news and rumors. Possibly, the underprivileged class being less aware about the disease failed to understand that a lot of sudden deaths in people with underlying etiology could be attributed to COVID-19.

Amongst the sociodemographic factors, age (less than 30 years) and sex (female) were associated with depression and anxiety. Our findings are consistent with other countries facing a similar situation where the prevalence of depression was greater in less than 30 years of age group (Moghanibashi-Mansourieh, 2020; Wang *et al.*, 2020). It seems that the COVID-19 lockdown has changed the dynamics and the younger age has become more vulnerable owing to a halt in the youngsters' academic and social life. This aspect should be an indicator for health experts and government agencies to design some policy to counsel the youth and maintain reliable platforms, as well as telemedicine for effective health communication strategies. Females were more prone to exhibit depression and anxiety than males in both the social classes which is consistent with previous studies conducted during the pandemic times in other countries (Liu *et al.*, 2020; Wang *et al.*, 2020). This finding is also consistent with previous studies conducted in Pakistan in the pre-pandemic times (Godil *et al.*, 2017).

In the current study, 36.24% people reported that their income was affected due to COVID-19 lockdown at different levels ranging from being mildly to strongly affected. Despite this, it was not associated with the outcome of mental stress and depression. This is in contrast to reports from other studies conducted during COVID-19 lockdown where the impact on financial status due to COVID-19 increased anxiety and depression (Wang *et al.*, 2020). One of the reasons for this difference could be the limited number of sample size and less access to people with more job insecurities. It is possible that the people who filled our questionnaire were more active on social media and responsive to emails, whereas people whose jobs had been affected and were depressed due to a financial situation may not have participated in the study.

In this study, we found that people who perceived their physical health as being poor were not only depressed but were more prone to suffer from clinical insomnia. This is consistent with reports from other countries (Liu *et al.*, 2020). Another factor that we studied regarding perception was fear of contracting COVID-19 due to exposure to servants coming into the houses despite the recommendation to avoid any influx of outsiders. It is very important to discuss this aspect because unlike countries such as China, Italy, Japan and Spain, the culture in Pakistani society is hugely different. One of the possibilities for this association could be that people who

called for help were aware of the risk it posed for their house, which may have affected their stress levels. We also found that people who were sure that they had contact with COVID-19 patients had more likelihood of insomnia than those who did not know or were unsure. Another association found was with the perception that they would not survive if get infected with COVID-19. Both the privileged and the underprivileged classes were likely to get distressed by this factor. This is relatable to other studies which reported a perceived risk of acquiring COVID-19 with depression (Zhong *et al.*, 2020). Depression was more likely to be presented in those people who were uncertain about the fact that whether they came in close contact with COVID-19 infected patients or not, as compared to those people who either were sure that they had or did not have contact. The likelihood of this factor was more prevalent in underprivileged people, possibly because they did not have an option to sit back at home during the lockdown.

## CONCLUSION

The government and the mental health institutes/non-governmental organizations should take up this data to possibly work on the factors that could be addressed. This consideration is more important in developing countries like Pakistan where already there is a scarcity of mental health infrastructure, which may ultimately have a more severe impact, especially on younger adults.

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