

THE LINGERING EFFECTS: EXAMINING MENTAL HEALTH IN INDIA DURING A PERIOD OF COVID-19 REGRESSION

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ABSTRACT

PURPOSE:

COVID-19 has been recognized as a contagious disease which can cause serious health problems, even proving to be fatal in some cases. The swift spread of COVID-19 epidemic shook the world which led to lockdowns, isolation, and social distancing for the general population so as to curb and contain the spread. This was found to lead to mental health disorders amongst people. This study examines the prevalence and severity of anxiety, stress perception, and well-being levels among the people at the time when the COVID-19 was in regression (decline) in India.

METHODS:

In this cross-sectional study, 374 respondents' mental health was evaluated using three standardized questionnaires: Generalized Anxiety Disorder [GAD-7], Perceived Stress Scale [PSS-4], and Five Wellbeing Index [WHO-5].

RESULTS:

The study revealed that almost 82% of respondents had moderate to severe levels of stress while 66% of respondents had mild to moderate levels of anxiety. Overall, 60% of respondents had poor (low) mental well-being. A strong negative correlation was found between mental well-being and perceived stress, and mental well-being and level of anxiety, in comparison to the correlation between anxiety and perceived stress was positive and statistically significant.

CONCLUSIONS:

This study identified several long-term psychological effects of COVID. The presence of stress and anxiety and poorer mental well-being even at the time of decline in COVID-19 cases, highlights the need for serious attention to be given to psychological and psychiatric help and support throughout the duration and regression of such diseases. Health policymakers must ensure coherent and consistent plans for screening the mental health of the general population are in place to provide the required support in managing the long-term psychological and psychiatric effects of COVID.

KEYWORDS

mental health, COVID-19, generalized anxiety disorder [gad-7], perceived stress scale [pss-4] and five wellbeing index [who-5].

INTRODUCTION

A novel strain of corona virus, identified as severe acute respiratory syndrome corona virus 2 (SARS CoV-2) was first found in December 2019 in Wuhan, China [1,2] to be the cause of the transmission of the novel coronavirus disease-19 (COVID-19) amongst human beings. COVID-19 has the ability to transmit from human to human, quickly spreading all over the world and has led to very serious health problems and even proved to be fatal in many cases [3]. Seeing the increasing number of cases, the World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern (PHEIC) - a global pandemic on March 12, 2020 [4].

COVID-19 is not the first outbreak of an infectious disease in the 21st century, there have been others including the Napa Virus, SARS and Ebola, although in some parts of the world but the magnitude of quick spread of COVID-19 was comparatively greater. Vaccines had yet to be developed, which led to the enforcement of mask wearing, quarantining, social distancing, isolation and countrywide lockdowns, as recommended ways to deal with the pandemic, resulting in the disruption of normal life both- personal and professional.

Such a widespread epidemic had not been seen in recent times and led to a great deal of negative psychological and economic consequences [5-7]. The enforced social isolation, uncertainty, increasing numbers of infections and related deaths, contributed to rising mental health issues, psychological distress, anxiety and physical problems [5-9]. As of April 30th, 2021, COVID-19 has led to the death of more than 3 million people all over the world [10].

The fear of becoming infected, the unpredictability of the symptoms, and the risk of stigmatization and discrimination, along with being socially isolated has led to mental health disorders, severe stress and other anxiety related issues, culminating in some instances in insomnia and other physical problems within the general public [11-14]. Previous studies have identified anxiety and stress as significant effects of epidemics, especially epidemics that involve risk of death in the general population. Such epidemics are often accompanied by depression and other psychological problems [15], with COVID-19 making people vulnerable to deteriorations in their mental health [16,17].

Duan et al. (2020) noted that COVID-19 has led to psychological distress amongst people and advocate for active and appropriate intervention to reduce this distress [18]. Similarly, Zheng (2020) has identified depression, post-traumatic stress disorder and other psychiatric disorders among survivors of the SARS-CoV-2 epidemic and emphasize the need for screening and treatment of associated psychiatric disorders during the COVID-19 pandemic [19].

Researchers are predicting that such pandemic may appear more frequently in the future, with some predictions that COVID will not perish, rather it will have phases of higher and lower infection rates, although it may never completely perish [20,21]. The majority of present-day research has focused on the ill effects of COVID-19 at its initial first wave, whilst minimal research has studied the mental health aspects at a time when the cases are declining. Considering the drastic lingering ill effects of such pandemics, it is imperative to monitor and research the mental health effects when the pandemic is in a phase of regression.

The study follows the theoretical approach of evidence-based management which believes in gathering the best available evidence so as to support the management decision-making for improving the performance of healthcare organizations and their services [22]. The current research globally are proposing that the use of an evidence-based approach results in better practice of health care management by progressing in the quality of managerial decisions [23-25]. This study therefore intends to gather the empirical data to examine the impact of COVID-19 on the mental health and wellbeing of a sample of the general population in India during the months of December 2020 to January 2021 when there was decrease in number of COVID cases. This would prove to be beneficial to form the fundamental evidence to support the decision making in managing the unknown long-term effects of Covid-19 by the health providers.

This study measured the levels of stress and anxiety prevalent amongst the sample population and the impact on their mental wellbeing. This study further investigated the possible impact of occupational, social status and gender differentiation on the respondents' mental health. As a result of the interaction of anxiety and stress with mental wellbeing [26,27] identified in this study, the contributory relationship of anxiety and stress was also investigated

between these diseases and related psychiatric disorders in persons with COVID-19.

METHODS

PARTICIPANTS AND PROCEDURES

The methodology for the study was cross-sectional in nature. Data was collected over 2 weeks in the curbs relaxed period of 27th January to 10th February 2021 using survey questionnaire with the intent to investigate the impact of the COVID-19 pandemic on a representative sample of the Indian adult population.

Based on Cochran's formula the sample size for the study was initially planned as minimum of 370 and accordingly the survey was distributed amongst 396 Indian adults. For the sample, the consenting adults were recruited electronically using convenience and snowball sampling methods, referrals and through social media forums in order to guarantee a large-scale distribution and recruitment of participants. There was no restriction on the total number of participants but to be eligible for the survey the respondents had to be adults (≥ 18 years) and older, able to understand English since the standardized tools (in English Language) were adopted for survey and had to be living in India both during acute and the decline phase of Covid-19. Considering the data was being collected on a sensitive theme and provided the anonymity to respondents, therefore it was expected that respondents would be able to provide information truthfully and honestly.

In total, 389 respondents participated in the survey and provided mental health related information. Further evaluation and cleaning of the received data revealed that only 374 responses were valid.

MEASURES

STUDY INSTRUMENT

This study administered a questionnaire consisting of the Perceived Stress Scale (PSS-4), Generalized Anxiety Disorder Scale (GAD-7) and Wellness Index scale (WHO - 5) to understand the mental health of the respondents. These instruments PSS-4 [28–32], GAD-7 [33–36], WHO-5 [37–40] have been used in other COVID studies that include mental health components in different countries and settings.

PSS is one of the most widely used tools for measuring psychological stress in clinical and non-clinical situations. The PSS-4 is a short form scale of PSS-14 containing four items 2 positive and 2 negative phrases from the original scale (items 2, 6, 7, and 14). It is popular scale to measure stress as it is easy to use, has been found to also have strong reliability and validity measures even when used in multiple settings as well as in different languages [41–43]. Version 4 (PSS-4) ranges from 0-16 (low to high) and has a triple classification based on intensity as high, moderate, and low wherein the higher scores signify higher stress [44].

The Generalized anxiety disorder (GAD-7) scale is a globally used standardized seven item self-reported instrument designed to screen for symptoms of anxiety [45,46]. The respondents provide their rating on a 4-point Likert scale about how often they have experienced anxiety symptoms in the two weeks preceding the study. The ranges of GAD-7 scores are 0–4, minimal anxiety; 5–9, mild anxiety; 10–14, moderate anxiety; and 15–21, severe anxiety [47]. Scores above 10 points indicate an anxiety disorder [48–51].

The World Health Organization-Five Well-Being Index (WHO-5) is a short, positively worded self-administered five item scale which assesses the level of emotional well-being during the past 14-day period on a six-point Likert scale graded from 0 [at no time] to 5 [all of the time]; the raw score ranges from 0 to 25 of well-being prior to test. Given its conciseness and focus on positive effect, the WHO-5, it is appropriate instrument to screen for low emotional well-being and depressive affect in respondents [52,53].

Overall, the questionnaire had four sections, consisting of demographics, PSS-4 scale, GAD -7 scale and WHO well-being index scale. The survey was developed and delivered in English. The study protocol consent form for the anonymity and voluntariness of participation, instructions about the scales formed the initial mandatory part of questionnaire. In order to ensure external validity of the survey, its contents were reviewed by a group of experts belonging to psychology domain, members of the medical education research group further to test internal validity the Cronbach alpha was calculated for the perceived stress scale, Anxiety Scale and WHO scale and was found to be above 0.7 individually and reliability of overall scale was found to be 0.693.

To test the normality of data, Kolmogorov-Smirnov test of normality was utilized. Descriptive statistics for the socio-demographic characteristics were reported as numbers

and percentages. Further a Chi-square (χ^2) test and F test were used to determine the association between the levels of the categorical variables. A generalized linear model based on negative binomial distribution was used to assess the confounding effects of socio-demographic factors, Stress factors and anxiety on the wellbeing. Variables included in the final model were selected using univariate general linear analysis and only factors with a cut-off value of $p < 0.5$ were considered to be statistically significant. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM, Chicago, IL, USA).

RESULTS

All valid responses were analyzed using SPSS.21 (IBM) software. The analysis consisted of Pearson's r coefficient

correlations, one-way analysis of variance (ANOVA) to evaluate significance of differences, and multiple linear regressions. In addition, descriptive statistics of the surveyed variables were presented.

Analysis of the demographics (Table 1) identified females constituted 44% of the sample and males 56% respectively. In terms of age, 18–24-year-olds and 25–39-year-olds represented 38% and 39% of the sample population respectively, while only 3.5% were 60 years or older. Of the sample of respondents 72% were post-graduate educated, 24% graduate educated, while only 4% had studied to secondary or senior secondary level. In salary brackets, 43.9% respondents were salaried, 31% were students, 12% were entrepreneurs, 7% were unemployed and 4.5% were homemakers.

TABLE1: DEMOGRAPHIC DATA DISTRIBUTION

Variable	N	Percent	Perceived Stress			Anxiety				Well Being			
			High Stress	Low Stress	Moderate	Mild	Minimum	Moderate	Severe	Depressive	Healthy	Low	
Gender	Male	209	55.9	12	35	162	34	57	105	13	15	55	139
	Female	165	44.1	7	34	124	27	45	81	12	14	69	82
Age	18 - 24	145	38.8	8	14	123	28	40	65	12	13	54	78
	25 - 39	146	39.0	9	26	111	19	30	86	11	12	46	88
	40 - 60	70	18.7	2	23	45	12	26	30	2	3	21	46
	60 & above	13	3.5	0	6	7	2	6	5	0	1	3	9
Education	Secondary	2	.5	0	0	2	0	0	2	0	0	2	0
	Senior Secondary	12	3.2	0	0	12	3	2	5	2	1	7	4
	Graduate	90	24.1	4	21	65	15	37	31	7	8	25	57
	Postgraduate & above	270	72.2	15	48	207	43	63	148	16	20	90	160
Employment	Unemployed	26	6.95	1	0	24	7	4	10	4	3	9	13
	Self Employed	48	12.8	4	10	34	3	8	33	4	3	16	29
	Prof/Service/Salaried	164	43.9	5	33	126	28	45	87	4	14	55	95
	Homemaker	17	4.5	1	8	8	1	7	7	2	1	3	13
	Student	119	31.8	8	18	94	22	38	49	11	8	41	71
N →			19	69	286	61	102	186	25	29	124	221	
Percent →			5.1	18.4	76.5	16.3	27.3	49.7	6.7	7.8	33.2	59.1	

Overall, high stress was identified within 5% of the sampled population, compared with 77% who had moderate stress levels. Only 18% of respondents reported low stress. Similarly, 77% respondents had minimum to moderate levels of anxiety, while only 16% had mild anxiety and 7% had severe anxiety. Healthy wellbeing was seen in only 33% of respondents, while 8% had a depressive mental state, with 59% having low wellbeing.

Of the 209 males, 162 had moderate stress, 12 reported high stress, 105 had moderate anxiety, 13 had severe anxiety, 139 had low mental wellbeing and 15 had a depressive mental state. Of the 165 females, 124 reported high stress, 7 had high stress, 81 had moderate anxiety, 12 had severe anxiety, while 82 had low wellbeing and 14 were in a depressive mental state. Moderate stress was

identified in 123 respondents of the age group 18–24 years old and 111 within the age group 25-29 years old.

Of the 270 post graduate respondents, 207 had moderate stress, 15 had high stress, 148 had moderate anxiety, 16 had severe anxiety and low mental wellbeing in 160 respondents. Finally, of 164 salaried respondents, 126 had moderate stress, 33 had mild stress, 5 had high stress, 87 had moderate anxiety and 95 had low mental wellbeing.

The gender based comparison of stress (Table 2) identified in males a mean of 6.54 and s.d. 2.302, while a mean of 6.26 and s.d. 2.311 was noted in females. Comparison of the means presented no significance difference between the stress levels based on gender ($F=0.13$, $p=.910$). Furthermore, no statistically significant association ($\chi^2 = 1.220$, $p = 0.543$) was observed between the levels of stress and the gender of the respondents.

Based on the age criteria, the 18–24-year-olds had a mean of 6.83 and s.d. 2.076, 25-39 year olds (mean 6.56, s.d.2.369),

40-60 years old (mean 5.54, s.d.2.339) and 60years and above (mean 4.93, s.d.2.2.90). The highest stress levels were seen among the 18–24-year-old age group, while the least stress levels were seen among the 60years and above group. The results also showed a significant relationship between age and Stress ($\chi^2 = 24.68$, $p = 0.00$). As it pertains to education the mean was highest (mean 7.33, S.d.1.55) for the respondents pursuing senior secondary education, followed by those in secondary or having secondary education, although there was no significant association between education and stress ($\chi^2 = 1.224$, $p = 3.01$).

In terms of employment, there is significant association between the stress levels and employment level ($\chi^2 = 4.247$, $p = 0.002$), with the highest stress amongst the non-employed (Mean, 7.68, s.d. 2.015), followed by students and self-employed, with the lowest stress levels found amongst homemakers (mean 4.88, S.d. 2.736).

TABLE 2: DESCRIPTIVE ANALYSIS

Variable		Gender		Age				Education				Employment				
		Male	Female	18 – 24 yrs	25 – 39 yrs	40 – 60 yrs	60 & above yrs	Secondary	Senior Secondary	Graduate	Post Graduate & above	Unemployed	Self Employed	Prof/ Serviced/ Salaried	Homemaker	Student
Perceived Stress	Mean	6.5	6.3	6.8	6.6	5.5	4.9	6.5	7.3	6.1	6.5	7.7	6.5	6.3	4.9	6.6
	SD	2.3	2.3	2.1	2.4	2.3	2.3	0.7	1.2	2.5	2.3	2.0	2.5	2.1	2.7	2.4
	Lower Bound	6.2	5.9	6.5	6.2	5.0	3.5	0.1	6.6	5.6	6.2	6.8	5.8	5.9	3.5	6.1
	Upper Bound	6.9	6.6	7.2	6.9	6.1	6.3	12.9	8.1	6.6	6.8	8.5	7.3	6.6	6.3	7.0
	F	1.4		7.2				1.2				4.2				
	Sig.	0.2		0.0				0.3				0.0				
	χ^2	1.220 ^a		24.686 ^a				5.943 ^a				19.757 ^a				
	p	0.5		0.0				0.4				0.0				
Anxiety	Mean	7.0	7.1	7.5	7.4	5.7	4.7	7.5	8.8	6.6	7.1	8.8	7.6	6.6	5.9	7.3
	SD	4.4	4.3	4.5	4.0	4.4	3.6	2.1	5.6	5.0	4.0	4.8	4.0	3.9	5.0	4.7
	Lower Bound	-1.0	-1.0	6.8	6.7	4.6	2.5	-11.6	5.3	5.5	6.6	6.8	6.4	6.0	3.3	6.4
	Upper Bound	0.8	0.8	8.3	8.0	6.7	6.9	26.6	12.4	7.6	7.6	10.7	8.7	7.2	8.5	8.1
	F	0.0		4.6				1.1				2.1				
	Sig.	1.0		0.0				0.4				0.1				
	χ^2	.178 ^a		15.714 ^a				18.931 ^a				27.883 ^a				
	p	1.0		0.0				0.0				0.0				
Well-Being	Mean	16.1	14.2	14.8	15.2	16.2	16.4	11.0	13.9	15.3	15.3	14.2	16.1	15.0	16.6	15.2
	SD	5.3	5.2	5.7	5.1	4.7	6.1	4.2	5.4	5.3	5.3	6.9	5.3	5.2	4.2	5.2

Lower Bound	15.3	13.4	13.8	14.3	15.1	12.7	-27.1	10.5	14.2	14.7	11.4	14.6	14.2	14.5	14.3
Upper Bound	16.8	15.0	15.7	16.0	17.3	20.1	49.1	17.3	16.5	15.9	17.1	17.7	15.8	18.8	16.2
F	11.4		1.3			0.7			1.0						
Sig.	0.0		0.0			0.6			0.4						
χ^2	11.296 ^a		4.329 ^a			8.933 ^a			3.583 ^a						
P	0.0		0.0			0.2			0.9						

The analysis of GAD-7 revealed that 163 (44%) of respondents had moderate anxiety, 6% had severe anxiety and 49% had mild anxiety. Of these, females had a higher level of anxiety, (mean 7.08, s.d.4.299) as compared to men, although there was otherwise no significant association between anxiety levels and gender ($\chi^2 = 0.178$, $p = 0.981$).

The highest anxiety levels in relation to age were found amongst the youngest respondents (18–24-year-old) (mean 7.54, s.d. 4.480), followed by the 25–39-year-olds (mean 7.38, s.d.4.040). The lowest levels of anxiety were seen amongst the 60 year and above group (mean 4.69, s.d. 3.614) and there was a significant association between age and anxiety ($\chi^2 = 15.714$, $p = 0.043$).

Based on education levels, the highest level of anxiety was amongst the senior secondary group (mean 8.83, s.d. 5.606), followed by the secondary level educated, and the postgraduate and above (mean 7.11, s.d. 4.207). There was a significant association between education level and levels of Anxiety ($\chi^2 = 18.931$, $p = 0.026$).

Based on employment status, the highest anxiety levels were amongst the unemployed (mean 8.76, s.d. 4.79), followed by the self-employed (mean 7.56, s.d. 4.031), with the least anxious being the homemakers (mean 5.94, s.d. 5.043). There was a significant association between the type of employment and levels of Anxiety ($\chi^2 = 27.883$, $p = 0.006$).

Analysis of WHO-5 results revealed 59% of respondents had healthy mental wellbeing, 32% were in the low mental wellbeing category and 8% had a depressive mental state. Further analysis revealed that males had a healthier wellbeing (mean 16.05, s.d. 5.272), as compared to females who had lower mental wellbeing (mean 14.21, s.d. 5.206). There was a significant association between levels of wellbeing and Gender ($\chi^2 = 11.295$, $p = 0.004$).

Similarly, it was identified that 40–60 years old and 25–39-year-olds groups had overall healthy mental wellbeing, with the people in the age group of 60 years and above having the higher level of wellbeing (mean 16.38, s.d. 6.117) and followed by those in 40–60 years old (mean 16.17, s.d. 4.666). Low mental wellbeing was found amongst the 25–39-year-old group (mean 15.16, s.d. 5.111), while the lowest wellbeing was found among the 18–24-year-olds (mean 14.77, S.d.57.07). There was significant correlation between the categories of age and levels of wellbeing ($\chi^2 = 4.329$, $p = 0.032$).

Based on education, postgraduates and graduates had a healthy wellbeing, with the graduates (mean 15.34, s.d. 5.296) slightly higher on the scale and followed by postgraduates (mean 15.30, s.d. 5.332). Secondary and senior secondary respondents' mental wellbeing was low, with the lowest was amongst secondary students (mean 11.00, s.d. 4.243). No significant association was seen between education and the levels of wellbeing.

In relation to employment, the higher mental wellbeing was amongst the homemakers (mean 16.65, s.d. 4.197), followed by the self-employed (mean 16.15, s.d. 5.320) and low mental wellbeing was identified amongst the unemployed and professional/serviced/salaried respondents, with the unemployed being lower on the scale of mental wellbeing (mean 14.24, s.d. 6.894). There was no significant association found between categories of age, employment and levels of wellbeing.

Further to the Pearson product-moment correlation (Table 3) was calculated to determine the relationship between Perceived Stress and Anxiety in respondents. There was a moderately strong, positive correlation between Perceived Stress and Anxiety ($r = 0.506^{**}$, $p=0.000$) which was statistically significant. Similarly, the analysis of correlation between Perceived stress and Mental wellbeing revealed moderately strong, negative correlation Perceived Stress

and Mental wellbeing ($r = -0.433^{**}$, $p=0.000$) which was statistically significant.

Lastly the product-moment correlation was calculated to determine the relationship between Anxiety and mental wellbeing in respondents. There was moderately strong, negative correlation between Anxiety and mental wellbeing ($r = -0.525^{**}$, $p=0.000$) which was statistically significant.

A multiple regression was run to predict the mental wellbeing of respondents based on gender, age, education level, employment type, stress levels and level of anxiety of the respondents.

The predicted wellbeing score of respondents is equal to **X =22.67+ (- 0.168) Age + (-2.067) Gender+ (0.742) Education+ (0.076) Employment+ (-0.572) Stress + (-0.492) Anxiety** per unit increase in each factor (Table 6). The individual predictors were examined further wherein age ($t = -0.576$, $p = .046$), gender ($t = -4.501$, $p=.000$), stress ($t = -4.993$, $p = .000$) and anxiety ($t = -8.913$, $p = .000$) were significant predictors in the model. Thus, out of the six variables only four variables added statistically significantly to the prediction, $p < .05$. These were age, gender, anxiety and stress. These variables statistically significantly predicted wellbeing, $F(6, 367) = 33.244$, $p < .0000$, $R^2 = .632$ (Table 4 and 5)

TABLE 3: PEARSON CORRELATIONS COEFFICIENT

		PSSTot	GADTot	WHO tota1
PSSTot	Pearson Correlation	1	.506**	-.433**
	Sig. [2-tailed]		.000	.000
	N	374	374	374
GADTot	Pearson Correlation	.506**	1	-.525**
	Sig. [2-tailed]	.000		.000
	N	374	374	374
WHO tota1	Pearson Correlation	-.433**	-.525**	1
	Sig. [2-tailed]	.000	.000	
	N	374	374	374
**. Correlation is significant at the 0.01 level [2-tailed].				

TABLE 4: MODEL SUMMARY

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.793 ^a	.652	.642	7.313
a. Predictors: [Constant], GADTot, Educ, Gender, Age, Employ, PSSTot				
b. Dependent Variable: WHO tota1				

TABLE 5: ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3710.802	6	618.467	33.244	.000 ^b
	Residual	6827.540	367	18.604		
	Total	10538.342	373			

a. Dependent Variable: WHO total

b. Predictors: [Constant], GADTot, Educ, Gender, Age, Employ, PSSTot

TABLE6: REGRESSION RESULTS

Coefficients ^a										
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	[Constant]	22.677	2.128		10.659	.000	18.493	26.861		
	Age	.168	.292	.026	.576	.046	-.741	.406	.839	1.191
	Gender	-2.067	.459	-.193	-4.501	.000	-2.970	-1.164	.957	1.045
	Educ	.742	.424	.078	1.747	.081	-.093	1.576	.879	1.138
	Employ	.076	.199	.018	.382	.703	-.315	.466	.817	1.225
	PSSTot	-.572	.115	-.248	-4.993	.000	-.797	-.347	.715	1.399
	GADTot	-.492	.060	-.401	-8.193	.000	-.610	-.374	.738	1.355

a. Dependent Variable: WHO total

Furthermore, the results revealed respondents' mental wellbeing decreased with increase of age, stress and anxiety, and decreased with changes in gender (male to female), as males had higher levels of mental wellbeing (by 2.067), as compared to females. Age was found to have the highest impact on mental wellbeing, followed by stress, with gender having the least impact on the mental wellbeing of respondent.

DISCUSSION

The majority of the respondents were male, within an age bracket of 18 – 39 years old, with a post graduate educational qualification and in a salaried class or professional service. The majority of respondents had moderate level of stress and mild to moderate levels of anxiety, with 59% reporting low wellbeing during the time of conducted study.

Regarding the relationship between socioeconomic status and stress, the highest levels of stress were seen amongst males 18–24-year-old, with lower levels of education and especially those who were unemployed. Stress was lower amongst people 60 years and above and those who were employed, and the rate of anxiety was higher amongst females as compared to males. Anxiety was highest in the 18–24-year-old group, with secondary and senior secondary degrees and who were unemployed, which is in

contrast to the 40-60 years old who were employment and had achieved a bachelor's degree.

The relationship between socio-economic levels and education with stress and anxiety, has been previously studied and led to varied opinions, with a good proportion proclaiming an inverse relationship between these variables [54]. This study supports the same results, as lower age respondents with lower levels of education and being unemployment had the highest levels of stress and anxiety.

Due to COVID-19, countries are going into lockdown, sometimes with complete curfews, which not only slows down economies, but also further dwindles job opportunities. Therefore, it may be expected that young people with low levels of education could continue to face more uncertain future and job prospects, which may in turn lead to higher levels of stress and anxiety.

Previous studies reveal that employed and self-employed persons display high levels of stress and anxiety, as they are concerned about their occupation/business stability being negatively impacted by economic problems [55,56]. Interestingly, the present study also supported this argument, as people aged 60 years and above and those who are retired or homemakers, were found to be less stressed and anxious as compared to others in sample population.

Regarding the relationship between gender and perceived stress and anxiety, previous studies have suggested a gender-based relationship between stress and anxiety [57]. These studies found higher levels of stress and anxiety amongst males [58], however in comparison, the results of this study revealed stress was higher amongst females, while anxiety was higher amongst males.

These findings warrant further investigation as the gender-based roles in Indian social environment are unique, and with the added complexity of the conditions associated with COVID-19, an accurate interpretation of the relationship between gender and anxiety and stress requires further evaluation.

Studies have identified a direct relationship between stress and negative psychological effects [59]. This study supports previous studies findings in this aspect, as a significant positive statistical relationship between anxiety and perceived stress was identified, along with a negative statistical relationship between anxiety and mental wellbeing and perceived stress and mental being. These results identify reduced mental wellbeing as a result of the prevalence of stress and anxiety.

Healthy mental wellbeing is an important challenge during the COVID-19 pandemic, as stress and anxiety are higher than the normal amongst the general population [60]. This study supports earlier studies in identifying stress and anxiety as leading to the majority of respondents having low mental wellbeing.

High psychological stress levels and high levels of anxiety are often seen in patients who are in isolation for treatment of COVID-19 [61,62]. Lim et al. (2020) in their study described how a male with no history of physical/mental illness or drug use developed depression, insomnia, and suicidal ideation during a period of isolation. Further, Lim et al. (2020) noted he experienced stress and anxiety not only about contracting COVID but also as a result of the stigma associated with patients who have COVID-19, and as result of the aforementioned, he required psychiatric intervention.

Long-term quarantine, insufficient information, frustration, and stigmatization increase stress and anxiety and negatively impact psychological health [34,35,38]. This has led to recommendations that people should be provided disease related appropriate information, with quarantine periods kept as short as possible, so as to manage and

reduce stress and anxiety [5]. Other studies have revealed a relationship between infections caused by respiratory viruses and mood disorders [63], with a possible direct connection between corona virus and long-term psychological effect [63,64,65].

During and after the SARS outbreak, long term psychological impact was seen amongst the survivors [59,66,67]. Lee et al. (2007) studied stress during the outbreak of SARS and one year thereafter and noted respondents had higher stress levels at the time of outbreak, and after a year they continued to show high levels of depression, anxiety, and post-traumatic stress [67]. Zatzick et al. (2008) noted subsequent occupational performance and functional decline issues in patients 12 months after a traumatic event and emphasized the need for early acute interventions in order to reduce these issues and maintain appropriate occupational performance [68].

This may also be true of COVID-19, as identified in the current study, at the time of rapid decline of COVID cases in India (end of February 2021), the stress and anxiety levels had not returned to normal levels, rather the mental wellbeing was still at low levels. People were back to living almost a normal life with markets open and economy booming, yet still the majority of respondents reported higher than normal levels of perceived stress and anxiety and reduced mental wellbeing.

COVID-19 and SARS have similar causative agent and similar outbreak pattern though according to experts, COVID-19 is more worrisome in terms of severity and extent than SARS [69]. This has led to fear of long-term persistence of the virus. Many studies post SARS, reveal the prevalence of reduced mental wellbeing, psychiatric disorders and PTSD 30 months post outbreak [59,66,67]. Researchers have stressed the need for proper planning to identify and treat psychiatric disorders especially during other infectious epidemics [66].

Therefore, given the serious concerns of people towards COVID-19, screening, effective and early treatment of stress and anxiety through counseling, may play an effective role in improving their mental health to reduce the long-term impact and effects.

CONCLUSIONS AND FUTURE IMPLICATIONS

The current study was based on the evidence-based management approach to healthcare services as it is believed to a valuable means of improving healthcare outcomes and quality overall [70]. The results of the study can be beneficial for health policymakers and workers who can rely on empirical data that has been collected to understand the ground realities of such unknown pandemic. The strength of the current study lies in the fact that very few studies world over have focused on the mental health and wellbeing during a phase when COVID-19 infection cases were on a downward trend. It brings to focus the needs and requirements of such phase as well as see. Also, there are very scanty studies that have focused on Indian population, which being the second largest populated country becomes even more important to study considering the danger of vast spread of pandemic. Further it has utilized the standardized tools of PSS5, GAD7 and WHO5 to measure mental health; this makes the results easily comparable with studies utilizing similar scale in other parts of the world. This study revealed that perceived stress, anxiety, and low mental wellbeing is highly prevalent among the respondents under study during COVID-19 even at a time when the number of cases were decreasing and people were back to their normal lives, the levels of perceived stress and anxiety had not returned to normal. This suggests that the psychological and psychiatric effects of COVID-19 are long lasting. This brings into focus the implications and need for interventions by policymakers and health managers. Despite being out of isolation and quarantine, the psychological effects still persisted and lead to low mental wellbeing. These effects are of the utmost importance as researchers have predicted COVID-19 will persist and will have many waves, thus it's important for health policymakers to understand along with medical intervention, there needs to be continuous psychological and psychiatric help to overcome the emotional and psychological effects of COVID-19.

Additionally, if psychiatric help is required during a regression phase of COVID-19 infections, health policymakers need to be even more vigilant and alert to these needs when infections are increasing. The importance of health policymakers having coherent plans for mental health screening and interventions throughout all phase of the COVID-19 pandemic and beyond cannot be overstated.

Certain limitations apply to this study. Firstly, the current study could not gather data at large scale due to certain constraints, the future studies can overcome this shortcoming by collecting data in larger number to validate the results. Additionally, the study was conducted in online mode wherein the questionnaires independently were filled by the study participants following snowball sampling process, this might result in responses in self-assessment varying in objectivity when the interviewer is absent as well as the drawbacks of the snowball sampling. Also, the respondents with poor internet accessibility were likely not included in the study, creating a selection bias in the population studied. Therefore, future studies can undertake a similar study which is carried out under-supervision and in an offline mode to take care of selection bias like issues. The current study does not carry out any comparisons of acute and decline phases of pandemic; therefore, it is recommended that future studies can explore the difference between the two. Furthermore, other important domains that can be explored include the impact of vaccinations on mental health. Finally, future research should explore the different psychiatric support needed at different phases of the pandemic so health policymakers can draft guidelines for the various and future phases, understanding the need-based perspective, while dealing with an unknown disease and its uncharted territories.

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