Original Research Article

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Impact of COVID-19 outbreak on the mental health of adolescents in India and their perceived causes of stress and anxiety

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ABSTRACT

Background: Outbreak of the 2019 novel Corona virus disease-2019 (COVID-19) pandemic has led to unanticipated psychological impact globally. Mental health of adolescents also requires significant attention. Therefore, this study aims to investigate the psychological stress and anxiety among adolescents in India during the COVID-19 pandemic and identify the most important precursors.

Methods: An online survey was undertaken where adolescents in the age group of 10 to 19 years were invited to participate with a self-administered questionnaire. A snowball sampling strategy was used, focusing on recruiting adolescents living in Bangalore, India. Perceived stress scale-4 (PSS-4) and Generalized anxiety disorder-2 (GAD-2) Scale were used. Questionnaires were anonymous to ensure confidentiality and reliability of data. Data collection took place over five days

Results: 156 (52.0%) had a high PSS-4 score of ≥ 8 and 132 (44.0%) respondents had a high GAD-2 score of ≥ 3 . Female gender and age were found to be statistically significant detrimental factors of stress and anxiety respectively (p<0.05). Academic delay and uncertainty about the future were found to be the most significant causes of perceived psychological distress among adolescents.

Conclusions: Majority of the adolescents experienced varying degrees of stress and anxiety due to the COVID-19 outbreak. Our findings have both clinical and policy implications. The findings of our study indicate the need to identify adolescents as high-risk groups to ensure timely targeted psychological interventions and stress mitigating measures.

Keywords: Mental health, COVID-19, Adolescents, Psychological distress, Stress, Anxiety

INTRODUCTION

From its outbreak epicentre in Wuhan, China the novel coronavirus disease-2019 (COVID-19) spread rapidly all over the world and on March 11, 2020 world health organization (WHO) declared COVID-19 a global pandemic as by then about 114 countries were affected. Governments across the globe implemented strategies to contain the transmission of the virus. Taking cues from its foreign counterparts the Government of India imposed nationwide mandatory lockdown policy which included temporary closure of educational institutions. According to

UNESCO, approximately 0.32 billion students in India have been affected by school closures due to the COVID-19 pandemic.²

Due to their increased desire for autonomy and peer interaction adolescents may experience formidable stress as a consequence of social distancing guidelines and home isolation policies.³ In addition adolescents are faced with an underdeveloped cognitive mechanism that inhibits self-regulation making them vulnerable to mental health issues during this developmental phase.^{4,5} The burden of adolescent mental health disorders falls on low and middle income countries such as India. About 250 million

adolescents, accounting for one-fifth of the world's total adolescent population reside in India alone. Various studies conducted in urban India have indicated that one in five adolescents endure high levels of stress in their daily lives. The most recent National mental health survey of India reported prevalence estimates of 13.5% for adolescent mental disorders in urban metropolitan areas and 6.9% in rural areas.

The pandemic not only brought with it the risk of death from infection but also unanticipated short-term and a possible long-term psychological effect. The unrelenting spread of infection, strict isolation measures, exam deferrals and delay in opening schools and colleges is expected to pose a significant stressor on the mental wellbeing of students of all ages. There have been studies on the psychological impact of the outbreak on the general population, health care workers, patients and the elderly.9-¹² However, to our knowledge till date no study has examined in detail the mental health status of adolescents in developing nations during the pandemic. Contextspecific research is urgently needed to guide the efforts of service planners, policy makers and health care providers in India and other lower-middle income countries. Therefore, we undertake this study with the following objectives: investigate the psychological stress and anxiety among adolescents in India during the COVID-19 pandemic and identify the most important precursors of stress and anxiety.

METHODS

Study population and data collection

A cross sectional, observational study was conducted among adolescents residing in Bangalore, India. The target population composed of adolescents in the age group of 10 to 19 years of age. A snowball sampling strategy was used whereby the online survey was first disseminated to preuniversity and high school students on various social media platforms and they were encouraged to pass it on to their peers. The questionnaires were completed in English and data was collected through google forms. Questionnaires were anonymous to ensure confidentiality and reliability of data. Data collection took place over five days from 9 am on 25th of April through to 9 pm on 29th April 2020. The participants were required to complete an e-consent form prior to the self-administered questionnaire following which they were given a link to a letter explaining the survey and were asked to provide this letter to their parents. The study involved no more than minimal risk and thus passive parental permission was used.

Rating instruments

Data was collected in four sections that composed of: socio-demographic information; and Perceived stress scale-4 (PSS-4) to measure feelings of psychological stress. One of the most widely used methods of assessing psychological stress is the PSS and has been used to

compare stress perceptions across countries. 13,14 Previous studies have established the merits of using PSS-4, in terms of the time required to complete and its ease of use over the internet. 15,16 Large scale studies across countries have previously established the internal consistency of the scale.¹⁴ Using this scale subjects are asked to evaluate the previous month before the time of self-report using a 5item Likert rating scale ranging from 0 (never) to 4 (very often) with total scores ranging from 0 to 16. Generalized anxiety disorder-2 (GAD-2) scale to evaluate feelings of anxiety and nervousness. The internet-based GAD-2 scale has been established as reliable and valid tools to quickly screen for GAD in both busy mental health settings and clinical research.¹⁷ The GAD-2 consists of two items with total scores ranging from 0 to 6. Based on pooled sensitivity and specificity values a score of ≥ 3 has been identified as an acceptable cut-off for identifying clinically significant anxiety symptoms in the general population.¹⁸ Respondents reported their symptoms using a 4-item Likert rating scale ranging from 0 (not at all) to 3 (nearly every day). Perceived cause of stress and anxiety was identified by asking the question "In the past two weeks in quarantine which of the following have been a cause of worry?" followed by 10 variables with multiple answer choices.

Data analysis

Data was entered into Microsoft excel data sheet and was analyzed using Statistical package for social sciences (SPSS) 22 version software. Categorical data was represented in the form of frequencies and proportions. Chi-square test was used as the test of significance for qualitative data. Continuous data was represented as mean and standard deviation. ANOVA (analysis of variance) was used as the test of significance to identify the mean difference between more than two groups for quantitative data. Graphical representation of data was done using Microsoft excel and word, which was also used to obtain various types of graphs such as bar diagram and pie diagram. A p value (probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.

RESULTS

We recorded responses from 300 respondents over a span of 5 days. Overall, 300 respondents submitted the questionnaires on the first day (25th April), 96 respondents submitted the questionnaires on the second day (26th April), 103 respondents submitted the questionnaires on the third day (27th April), 54 respondents submitted the questionnaires on the fourth day (28th April) and only 17 respondents submitted the questionnaires on the fifth day (29th April).

In the study majority were females (71.3%) in the age group of 17 to 18 years (68.3%) with upper secondary level of education (85.0%) (Table 3).

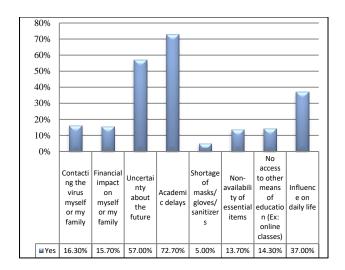


Figure 1: Bar diagram representing perceived cause of worry in past two weeks.

Levels of psychological stress among quarantined adolescents

The psychological impact of quarantine, measured using the PSS-4 scale, revealed a sample mean score of 7.44 (SD=3.19). Of all respondents, 156 (52.0%) had a high PSS-4 score of ≥ 8 , indicating high stress levels. Table 1 shows the response distribution to PSS-4 among the study subjects. 38.3% felt that they were unable to control the important things in their life- sometimes. 32% felt confident about their ability to handle personal problems-sometimes. 40% felt that things were going their way-sometimes and 33% felt difficulties were piling up so high that they could not overcome them- sometimes.

Levels of anxiety among quarantined adolescents

Mean GAD-2 score was found to be 1.42 (SD 1.03).

Table 1: PSS-4 scale distribution among subjects.

PSS-4 scale	Never		Almost Never		Sometimes		Fairly Often		Very Often	
PSS-4 Scale	Count	%	Count	%	Count	%	Count	%	Count	%
In the last month, how often have you felt that you were unable to control the important things in your life?	46	15.3	51	17.0	115	38.3	61	20.3	27	9.0
In the last month, how often have you felt confident about your ability to handle your personal problems?	12	4.0	34	11.3	96	32.0	92	30.7	66	22.0
In the last month, how often have you felt that things were going your way?	38	12.7	58	19.3	120	40.0	63	21.0	21	7.0
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	38	12.7	64	21.3	99	33.0	60	20.0	39	13.0

Table 2: GAD-2 scale distribution among subjects.

GAD-2 Scale	Not at all		Several days		More than half the days		Nearly every day	
	Count	%	Count	%	Count	%	Count	%
In last 2 weeks, how often have you felt nervous, anxious/on edge?	70	23.3	71	23.7	116	38.7	43	14.3
In last 2 weeks, how often you unable to control/stop worrying?	65	21.7	73	24.3	103	34.3	59	19.7

Table 3: Association between PSS-4 and GAD-2 score and demographic profile of subjects.

Socio-demographic variables				PSS-4 Score					GAD-2 Score				
		Count	%	≥8		<8		P	≥3	23 <3			P
				Count	%	Count	%	value	Count	%	Count	%	value
Age (years)	<14	17	5.6	7	41.2	10	58.8		3	17.6	14	82.4	0.030*
	15 to 16	56	18.6	28	50.0	28	50.0	0.054	19	33.9	37	66.1	
	17 to 18	205	68.3	115	56.1	90	43.9	0.054	99	48.3	106	51.7	
	>18	22	7.3	6	27.3	16	72.7		11	50.0	11	50.0	
Gender	Female	214	71.3	121	56.5	93	43.5	0.013*	94	43.9	120	56.1	0.967
	Male	86	28.7	35	40.7	51	59.3	0.015**	38	44.2	48	55.8	
Education	Bachelors/university	28	9.3	13	46.4	15	53.6	0.118	12	42.9	16	57.1	0.075
	Lower secondary	17	5.7	5	29.4	12	70.6		3	17.6	14	82.4	
	Upper secondary	255	85.0	138	54.1	117	45.9		117	45.9	138	54.1	
Type of family	Joint family	35	11.7	19	37.3	32	62.7	0.068	21	41.2	30	58.8	0.419
	Nuclear family	245	81.7	129	54.9	106	45.1		107	45.5	128	54.5	
	Single parent family	20	6.7	8	57.1	6	42.9		4	28.6	10	71.4	
Number of individuals in the household	Six people or more	81	27.0	13	37.1	22	62.9	_	16	45.7	19	54.3	0.562
	Three to five people	219	73.0	129	52.7	116	47.3	0.057	105	42.9	140	57.1	
	Two People	35	11.7	14	70.0	6	30.0		11	55.0	9	45.0	
Siblings	I am the only child	245	81.7	37	45.7	44	54.3	0.183	36	44.4	45	55.6	0.925
	I have a sibling	20	6.7	119	54.3	100	45.7		96	43.8	123	56.2	

As depicted in table 2, 70 (23.3%) reported no anxiety or nervousness whereas 230 (76.7%) reported experiencing varying frequency of anxiety or nervousness. 65 (21.7%) reported being able to stop or control worrying and 235 (78.3%) reported varying frequencies of uncontrollable worry. 132 (44.0%) respondents had a high GAD-2 score of \geq 3.

Socio-demographic variables and their association with PSS-4 and GAD-2 scale

In the study there was significant association between gender and PSS-4 score (p<0.05). Among females, 56.5% had PSS-4 score ≥8 and 43.5% had PSS-4 score <8, among males, 40.7% had PSS-4 score ≥8 and 59.3% had PSS-4 score <8. Hence, females experienced more stress compared to males. There was no significant association between PSS-4 score and other parameters such as age, education, type of family, number of individuals and siblings.

In the study there was significant association between age of the respondents and GAD-2 score (p<0.05). Among subjects in the age group <14 years, 17.6% had GAD-2 score ≥3 and subjects aged >18 years, 50% had GAD-2 score ≥3. Hence, with increase in age there was increase in GAD-2 score. There was no significant association between GAD-2 score and other socio-demographic parameters such as gender, education, type of family, number of individuals and siblings.

In the study there was significant positive correlation between PSS-4 score and GAD-2 score (correlation coefficient: 0.381, significant at the 0.01 level (2-tailed) and p value <0.001), therefore with increase in PSS-4 score there was an increase in GAD-2 score and vice versa.

Perceived causes of stress and anxiety

Drawing from the data represented in figure 1, majority indicated academic delays (72.70%), uncertainty about the future (57.00%) and influence on daily life (37.00%) to be the most significant stressors and cause of anxiety. Contracting the virus (16.30%), financial impact (15.70) and no access to other means of education (14.30%) were found to be the other causes of psychological stress and anxiety. Non-availability of essential items (13.70%) and shortage of masks/gloves/sanitizers (5.00%) were perceived to be lesser causes of stress and anxiety.

DISCUSSION

The results of previous studies have indicated that public health emergencies can have numerous psychological effects on young minds, which is often expressed as anxiety, fear and worry.¹⁹ The main aim of the present study was to evaluate the psychological distress experienced by adolescents in developing nations during the pandemic and explore the factors influencing their anxiety. Similar to studies establishing stress and anxiety

in the general population due to the pandemic the results of our survey indicate that majority of the adolescents too experienced high stress and anxiety levels.²⁰

The current study indicates that anxiety regarding the pandemic was associated with the age of the adolescents indicating that older children were more likely to experience feelings of anxiety as a consequence of the pandemic. Our socio-demographics data suggests that females suffered greater psychological impact of the outbreak in terms of perceived stress levels. This finding is in line with previous extensive epidemiological studies which found women to be at higher risk of depression. However, no significant difference in education, type of family, siblings and number of individuals in household was indicated.

Similar to previous studies, majority of the adolescents indicated academic delays and uncertainty about the future to be the most significant causes of perceived stress. ^{22,23} Influence on daily life, risk of contracting the virus and financial impact were found to be the other causes of stress and anxiety. Though non-availability of essential items, shortage of masks, gloves and sanitizers received considerable attention and overwhelmed the news headlines, it was found to be a minor cause of worry and anxiety among the youth.

The limitation of the study was that it was conducted online; therefore, adolescents residing in rural areas or those without an internet connection might not have participated. Further studies with more robust sampling methods representing data from all regions are warranted. Given the strict measures implemented by the government and the time sensitivity of the COVID-19 outbreak, we adopted a snowball sampling strategy which is not based on random selection of the sample. As a result, there was an oversampling of a particular network of peers and did not reflect the actual pattern of the general population. Notwithstanding the above limitations, the findings of our study can be utilized to undertake mental health interventions to improve the psychological resilience of adolescents during the COVID-19 pandemic. It provides policy makers an insight about the perceived causes of stress and anxiety among adolescents in low- and middleincome countries in order to implement effect mitigating measures. It also provides a baseline for evaluating control and treatment efforts through the pandemic and also in the post pandemic time.

CONCLUSION

In conclusion, we established that majority of the adolescents experienced varying degrees of stress and anxiety due to the COVID-19 outbreak. Age and female gender were found to be significant detrimental factors. Our findings have both clinical and policy implications. Academic delay and uncertainty about the future were found to be the most significant causes of perceived psychological distress among adolescents. The findings of

our study indicate the need to identify adolescents as highrisk groups to ensure timely targeted psychological interventions and stress mitigating measures.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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