

A Survey to Evaluate Mental Well-Being and Coping Strategies of Adolescents during COVID-19 Pandemic in Bangalore, India

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ABSTRACT

Background: The COVID-19 pandemic has brought about significant changes in the lifestyle of adolescents. Adolescence is a development stage of high vulnerability that can impact well-being later in life. Mental health plays an important role in one's quality of life. Understanding coping mechanisms helps make a person safe and resilient from psychological distress. The present study aims to evaluate the mental well-being and coping strategies used by adolescents in India during the COVID-19 pandemic. **Methods:** A cross sectional study was conducted in a school in Bangalore, India via an online survey, circulated via the class teacher. Participants included 222 adolescents with ages ranging from 13 to 19. The DASS-21 and Brief COPE scales were used to assess mental well-being and coping mechanisms respectively. The questionnaire concluded with validated general lifestyle related questions. This included inquiring relationships between students and their families, friends, academic performance, social media consumption etc. The data was collected over a period of one month. **Results:** In the DASS-21 scoring, 31.9% (n=69), 24.8% (n=55) and 5.4% (n=12) received scores indicating extremely severe depression, anxiety and stress respectively. Females were statistically found to be more depressed and anxious than males. Behavioural disengagement and self-blame were commonly used coping mechanisms by those who were found to be psychologically distressed. **Conclusions:** Psychological distress has been observed in adolescents in varying degrees during the COVID-19 pandemic. This should be addressed in order to prevent further distress.

Introduction

Adolescence is a stage of physical and psychological development of a person. It is the stage of intense desire for independence to a heightened sense of vulnerability. During this transition from childhood to adulthood, one feels an increased inclination to understand oneself better. Peers, family, media, school and various other cultural influences have a remarkable influence on the adolescent mind [1].

The Coronavirus Disease 2019 (COVID-19) pandemic brought in challenges for all, particularly for adolescents, school closures lead to home confinement. Schools transitioned from in person classes/activities to online modes of education, forcing adolescents to adapt to this new norm. This raised concerns as excessive screen time is considered to have a negative impact on mental health [2,3]. In India, the national mental health survey, 2016 reported the prevalence of mental disorders to be 7.3% among ages 13-17 years. It is similar in both genders. The prevalence among urban children is nearly double [4].

During the pandemic, various studies have been conducted throughout the globe to evaluate the mental well-being of adolescents [5,6,7]. Some studies included self-designed validated questionnaires with the results being collected via Likert-scale [5]. Another study utilised the DASS-21 (Depression, Anxiety and Stress Scales by Lovibond and Lovibond) questionnaire along with an ad-hoc questionnaire and the INFO-OV (Oviedo

Infrequency Scale) scale [6]. A study conducted in Bangalore, India mentioned that most adolescents experienced various degrees of stress and anxiety due to the pandemic. It used the PSS-4 (Perceived Stress Scale 4) and GAD-2 (Generalised Anxiety Disorder Scale-2) scale. The findings indicated the need to identify adolescents as high-risk groups. The study suggested timely, targeted psychological interventions [7]. However, based on our literature search, the studies conducted in India did not investigate the coping mechanisms.

With this background, this study is undertaken to evaluate the mental well-being and coping strategies of adolescents during COVID-19 pandemic in Bangalore, India

Materials and Methods

Study population and data collection

This was a cross-sectional study conducted amongst adolescents residing in Bangalore, India studying in Ryan Global School. The permission for the same was obtained from the principal of the school. The questionnaire was forwarded to the students through their class teachers. 312 students were forwarded the survey out of which 222 took the survey. Adolescents from the age of 13 to 19 were eligible to fill the survey. The questionnaire was designed in English. The data was collected through Google forms. To ensure reliability of the data collected and maintain confidentiality, the questionnaire was anonymous. All the questions were marked as required. An age limit was set through google forms (age range: 13-19). This ensured that the responses that did not meet the inclusion criteria were filtered out immediately. The data was collected over a period of one month, between 16th February to 15th March. Participation was voluntary. Due to this, participants were allowed to stop answering the questions anytime they wished. The questionnaire had a section providing consent in the beginning. Participants below the age of 18 needed to take consent from their parents.

Instruments used

The survey questionnaire included questions regarding demographic information. It was followed by the DASS-21 (Depression, Anxiety and Stress Scales by Lovibond and Lovibond), which evaluated the mental well-being of the participants. The Brief Coping scales were included to measure the coping mechanisms used. The questionnaire concluded with a set of general lifestyle related questions.

The DASS-21 scale contains 21 items that are ranked in the form of a Likert scale. The score for each item ranges from 0 (never) to 3 (almost always). These 21 items are divided into 3 subscales with 7 items each which measure levels of depression, anxiety, and stress. The scores as described in DASS-21 are normal (0-4), mild (5-6), moderate (7-10), severe (11-13) and extremely severe (14-21) for depression. For anxiety, the scores described range from normal (0-3), mild (4-5), moderate (6-7), severe (8-9) and extremely severe (10-21). With regards to stress scores, DASS-21 describes the scores as : normal (0-7), mild (8-9), moderate (10-12), severe (13-16) and extremely severe (17-21). The DASS-21 scale has proven reliability and validity to measure the levels mentioned above [8].

The Brief COPE is derived from the COPE inventory. It consists of 28 items which measure coping strategies, ranked according to a Likert scale. The score with each item ranges from 1 (I've not been doing this at all) to 4 (I've been doing this a lot). The various coping styles presented comprise two core factors: avoidant coping (self-distraction, denial, behavioural disengagement, substance use, venting and self-blame) and approach coping (active coping, emotional support, use of informational support, positive reframing, planning and acceptance). The scales also comprise humour and religion. These fall under neither avoidant nor approach coping. The brief COPE has proven reliability and validity along the lines of the COPE inventory [9]. It has been utilised to assess coping strategies used during infectious disease outbreaks in the past [10].

The questionnaire concludes with validated general lifestyle related questions. The scope of these questions ranges from changes in familial relationships to academic performance to consumption of media to physical activity etc.

Data Analysis

The raw data obtained through Google Forms was transferred to Google Sheets. Following which, the statistical computations were conducted using the Python package SciPy. SciPy is an open-source scientific computing library. The functionality of SciPy is diverse. It can be used in multiple scientific fields. SciPy provides fundamental algorithms for scientific computing. It provides statistical tools including correlation functions, chi square tests, hypothesis tests, frequency statistics and much more [11]. The scoring of the mental well-being factors was compiled as prescribed by the authors of DASS-21. Data of male and female participants was separated, and the chi-square test was applied. A p-value of <0.05 was considered significant. This was followed by computation of correlations of each of the 14 Brief COPE scales with each of the 3 DASS-21 factors (depression, anxiety and stress). A correlation of >0.5 was considered significant.

Results

i) Demographic details: The survey participants consisted of 222 adolescents. The mean age recorded was 16.1(range: 13-19, SD: 1.16). Survey participants included 103 males and 119 females. Females included 53.6% of participants.

ii) Mental wellbeing: The DASS-21 scores obtained indicate that 18.5%(n=41) had a score ranging from: 0-4. 31.1%(n=69), 9.9%(n=22), 23.4%(n=52) and 17.1%(n=38) of the study population suffered from extremely severe (14-21), severe (11-13), moderate (7-10) and mild levels (5-6) of depression respectively. Regarding anxiety, 29.3%(n=65) received a normal anxiety score ranging from: 0-3. 24.7%(n=55), 11.7%(n=26), 16.2%(n=36) and 18.0%(n=40) of the study population suffered from extremely severe (10-21), severe (8-9), moderate (6-7) and mild (4-5) levels respectively. About stress, normal (0-7) levels were observed in 41.9%(n=51) of the study population. 5.4%(n=12), 14.4%(n=32), 17.1%(n=38), and 21.2%(n=47) showed extremely severe (17-21), severe (13-16), moderate (10-12) and mild (8-9) levels of stress respectively. Females were statistically found to be more depressed than males (p, 0.016). They were also found to be more anxious than males (p, 0.015). The results are shown in Table 1.

Table 1. Overall DASS-21 scores

DASS scales		Normal	Mild	Moderate	Severe	Extremely severe
Depression	Overall	18.5% (41)	17.1% (38)	23.4% (52)	9.9% (22)	31.1% (69)
	Male	26.2% (27)	19.4% (20)	18.5% (19)	5.8% (6)	30.1% (31)
	Female	11.8% (14)	15.1% (18)	27.7% (33)	13.5% (16)	31.9% (38)
Anxiety	Overall	29.3% (65)	18.0% (40)	16.2% (36)	11.7% (26)	24.8% (55)
	Male	36.9% (38)	18.5% (19)	19.4% (20)	8.7% (9)	16.5% (17)
	Female	22.7% (27)	17.7% (21)	12.6% (15)	14.3% (17)	31.9% (38)

Stress	Overall	41.9% (93)	21.2% (47)	17.1% (38)	14.4% (32)	5.4% (12)
	Male	49.5% (51)	21.4% (22)	15.5% (16)	10.7% (11)	2.9% (3)
	Female	35.3% (42)	21.0% (25)	18.5% (22)	17.7% (21)	7.6% (9)
<p>Chi-square test was applied for each parameter. <i>Depression:</i> p value 0.016 (chi-square value = 12.16) <i>Anxiety:</i> p value 0.015 (chi-square value = 12.19) <i>Stress:</i> p value 0.134 (chi-square value = 7.01)</p>						

iii) Coping mechanisms: Regarding coping, 55.9% (n=124) of the survey population reported that they were distracting themselves through activities like movies, reading, sleeping etc. 9.9% (n=22) stated that they were in denial of the changes the pandemic had caused in their lives. 93.2% (n=207) denied using substances like alcohol and drugs. 13.1% (n=29) reported receiving constant emotional support from others. 9.0% (n=20) stated that they received advice and help on coping with the pandemic from other people regularly. 41.4% (n=92) felt that they were not giving up the attempt to cope. 13.5% (n=30) reported not looking at the situation with a positive light. 9.5% (n=21) felt that they were not learning to live with the current situation. 59.9% (n=133) reported that they did not find comfort in their religion or spiritual beliefs.

Table 2. Brief COPE scores

Factors	Question	I haven't been doing this at all	A little bit	A medium amount	I've been doing this a lot
Self-distrac-tion	1. I've been turning to work or other activities to take my mind off things.	15.8% (35)	40.9% (90)	23.9% (53)	19.8% (44)
	2. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping	9.9% (22)	14.4% (32)	19.8% (44)	55.9% (124)
Active coping	1. I've been concentrating my efforts on doing something about the situation I'm in.	18.9% (42)	36.9% (82)	32.0% (71)	12.2% (27)
	2. I've been taking action to try to make the situation better.	15.8% (35)	32.9% (73)	35.6% (79)	15.8% (35)
Denial	1. I've been saying to myself "this isn't real".	57.7% (128)	22.1% (49)	12.2% (27)	8.1% (18)
	2. I've been refusing to believe that it has happened.	64% (142)	19.4% (43)	6.8% (15)	9.9% (22)

Substance use	1. I've been using alcohol or other drugs to make myself feel better	92.8% (206)	3.6% (8)	2.3% (5)	1.4% (3)
	2. I've been using alcohol or other drugs to help me get through it.	93.2% (207)	3.2% (7)	2.3% (5)	1.4% (3)
Emotional support	1. I've been getting emotional support from others.	35.1% (78)	34.2% (76)	17.6% (39)	13.1% (29)
	2. I've been getting comfort and understanding from someone.	29.3% (65)	34.7% (77)	21.2% (47)	14.9% (33)
Use of informational support	1. I've been getting help and advice from other people.	34.7% (77)	34.7% (77)	21.6% (48)	9.0% (20)
	2. I've been trying to get advice or help from other people about what to do.	38.7% (86)	39.2% (87)	11.7% (26)	10.4% (23)
Behavioral disengagement	1. I've been giving up trying to deal with it.	38.3% (85)	29.3% (65)	12.2% (27)	20.3% (45)
	2. I've been giving up the attempt to cope.	41.4% (92)	31.5% (70)	12.6% (28)	14.4% (32)
Venting	1. I've been saying things to let my unpleasant feelings escape.	36.5% (81)	32.9% (73)	16.7% (37)	14.0% (31)
	2. I've been expressing my negative feelings.	35.1% (78)	33.3% (74)	17.1% (38)	14.4% (32)
Positive re-framing	1. I've been trying to see it in a different light, to make it seem more positive.	18.5% (41)	31.5% (70)	30.6% (68)	19.4% (43)
	2. I've been looking for something good in what is happening.	13.5% (30)	27.0% (70)	30.6% (68)	28.8% (64)
Planning	1. I've been trying to come up with a strategy about what to do.	17.1% (38)	32.4% (72)	30.2% (64)	20.3% (45)
	2. I've been thinking hard about what steps to take.	19.8% (44)	29.3% (65)	27.9% (62)	23.0% (51)
Humor	1. I've been making jokes about it.	24.1% (53)	23.6% (52)	23.6% (52)	28.6% (63)
	2. I've been making fun of the situation.	34.7% (77)	32.0% (71)	12.2% (27)	21.2% (47)
Acceptance	1. I've been accepting the reality of the fact that it has happened.	13.5% (30)	24.3% (54)	21.2% (47)	41.0% (91)

	2. I've been learning to live with it.	9.5% (21)	22.5% (50)	33.3% (74)	34.7% (77)
Religion	1. I've been trying to find comfort in my religion or spiritual beliefs.	59.9% (133)	19.4% (43)	10.8% (24)	9.9% (22)
	2. I've been praying or meditating	54.5% (121)	23.4% (52)	9.9% (22)	12.2% (27)
Self-blame	1. I've been criticizing myself.	20.3% (45)	24.3% (54)	23.4% (52)	32.0% (71)
	2. I've been blaming myself for things that happened	36.5% (81)	24.8% (55)	15.8% (35)	23.0% (51)

iv) **Correlation between DASS-21 and Brief COPE:** Behavioural disengagement was observed to be a coping mechanism used by those suffering from depression. A Pearson correlation of 0.67 was recorded. In terms of stress, behavioural disengagement showed a Pearson correlation of 0.63. Self-blame was noted to have a Pearson correlation of 0.65 with depression. Anxiety had a Pearson correlation of 0.56 and stress had a Pearson correlation of 0.63 with self-blame. The results are shown in Table 3.

Table 3. Pearson correlation between DASS-21 and Brief COPE

Factors	Correlation with depression	Correlation with anxiety	Correlation with stress
Self-distraction	0.30	0.28	0.26
Active coping	-0.09	0.01	0.07
Denial	0.31	0.45	0.35
Substance use	0.24	0.25	0.20
Emotional support	-0.05	0.10	0.13
Use of informational support	-0.08	0.08	0.14
Behavioural disengagement	0.67	0.49	0.63
Venting	0.33	0.38	0.40
Positive reframing	-0.21	-0.05	-0.11
Planning	0.10	0.20	0.23
Humor	0.07	0.05	0.06

Acceptance	0.06	0.05	0.04
Religion	-0.06	0.03	0.07
Self-blame	0.65	0.56	0.63

iv) **Lifestyle related questions:** 41.4%(n=92) survey participants responded that their relationship with their families had improved. In terms of their relationship with their friends, 43.2%(n=96) felt that it had improved. 40.1%(n=89) reported that their diet had worsened. Academic performance had been observed to worsen by 55.0%(n=122) of the survey participants. Results in Table 4.a.

45.0%(n=100) of the participants felt that they spent more time on social media and entertainment platforms over the course of the pandemic. Nearly 43.7%(n=97) of them agreed that they regularly took part in physical activities. Results in Table 4.b.

55.8%(n=124) of the survey population reported that they spent more than 3 hours on social media/entertainment platforms regularly. Results in Figure 1.

Music seemed to be the most common activity used to cope with the lifestyle changes caused by the pandemic. Results in Figure 2.

Table 4. Lifestyle related questions

a)

Factors	Im- proved	Stayed the same	Wors- ened
My relationship with my family has _____ due to the pandemic	41.4% (92)	38.3% (85)	20.3% (45)
My relationship with my friends has _____ due to the pandemic	43.2% (96)	31.1% (69)	25.7% (57)
Due to COVID-19, my diet has	25.7% (57)	34.2% (76)	40.1% (89)
Due to COVID-19, my academic performance has	18.0% (40)	27.0% (60)	55.0% (122)

b)

Factors	Strongly disagree	Disa- gree	Neither agree nor disagree	Agree	Strongly agree
I spent longer durations of time on social media/entertainment platforms due to the pandemic	7.2% (16)	5.4% (12)	12.2% (27)	30.2% (67)	45.0% (100)
I regularly participated in physical activities	12.2% (27)	24.3% (54)	19.8% (44)	27.9% (62)	15.8% (35)

Approximate amount of time I spend on social media/ entertainment platforms
222 responses

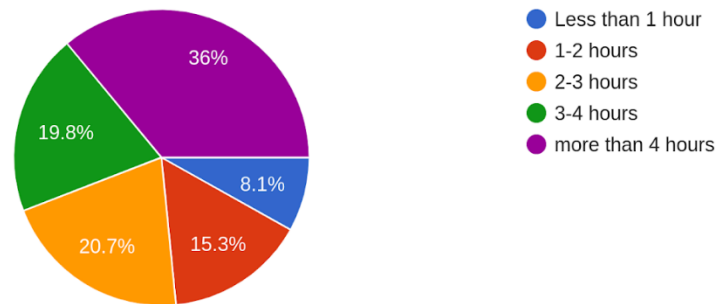


Figure 1.

The main ways I have coped with the pandemic are:
222 responses

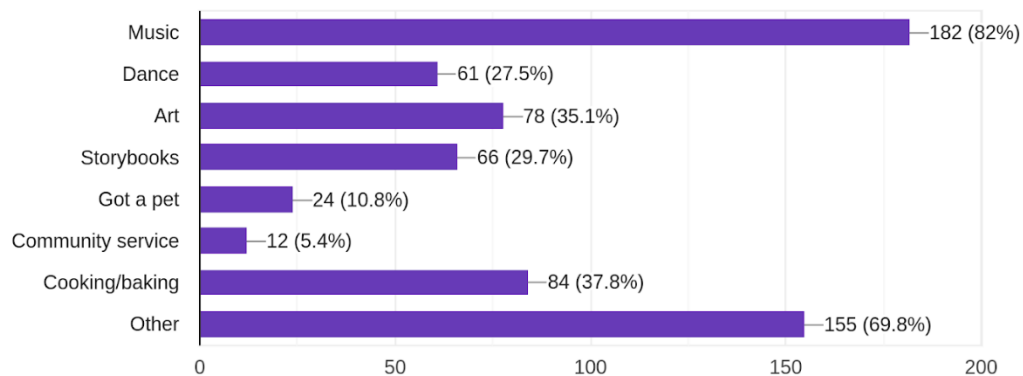


Figure 2.

Discussion

This survey consisted of 222 adolescents who participated. The mean age recorded was 16.1(range: 13-19, SD: 1.16). Female participants included 53.6% of participants, which is comparable with similar studies elsewhere. A study conducted in Spain with a similar background had females comprise 63.1% of the study population. The ages ranged between 13 and 17 [6]. Another study conducted in Italy had males representing 72.9% of the sample. The ages ranged from 15-21 [5]. In south India, a previous study included adolescents whose age ranged from 10-19 years. 71.3% of the study population included females [7].

Based on literature search till date, this is the first high school student driven study on this topic. This study as compared to its Spanish counterpart observes much higher levels of depression, possibly a result of the pandemic. Anxiety too was observed at much higher levels. Stress levels, though higher, had a comparatively lower difference as compared to depression and anxiety levels [6]. Another Indian study recorded high stress levels in 52% adolescents using the PSS-4 scale (Perceived Stress Scale-4). It also measured anxiety levels in 44% of adolescents using the GAD-2 (Generalized Anxiety Disorder-2) scale [7]. Females were statistically found

to be more depressed than males ($p, 0.016$). They were also found to be more anxious than males ($p, 0.015$). The Spanish study too observed that females were more likely to suffer from depression and anxiety [6]. This can be speculated to be based on biological differences across gender.

Brief COPE was utilised to observe the methods of coping used. In situations where one suffered from depression, anxiety and stress. A study conducted in Saudi Arabia amongst healthcare professionals utilised brief COPE for the same purpose. It emphasised on the importance of identifying and understanding coping strengths as it makes the person safer and resilient. Also, given the significant changes the pandemic has brought about in life today, it's very important to enhance the understanding of how people have coped during the COVID-19 pandemic. The study observed that the common coping strategies used included religion, denial, and avoidance [12]. Amongst the survey population here, behavioural disengagement and self-blame were found to have high correlations with psychological distress. The difference observed in coping strategies may be connected to the difference in age group and demographic characteristics of the participants, and culture [13].

In terms of changes in relationships, 41.4% ($n=92$) felt that their relationship with their family had improved. 43.2% ($n=96$) reported improvement in the relationship with their friends. This positive change may be credited to the increase in time spent with family. This could've resulted in discovering new things about each other. Though adolescents spent time not being able to meet their friends, the pandemic resulted in adolescents recognising their real friends [14]. It can be theorized that switching to online modes of communication with friends made it noticeable which connections were worth the effort. Missing these connections had possibly increased the value that adolescents had for their friends.

Amongst the survey population, 40.1% ($n=89$) believed that their diet had worsened. 47.7% ($n=106$) disagreed that they regularly participated in physical activities. Previous studies have indicated that weight gain was observed amongst adolescents due to the increase in consumption of snacks and decrease in physical activities [15]. Unhealthy dietary patterns have significant cross-sectional relationships with poor mental health in adolescents [16]. Hence, it's likely that the deterioration in diet can be associated with the psychological distress that the pandemic has resulted in [17].

The COVID-19 pandemic resulted in education shifting from in person modes to online modes. To the best of our literature search, no scientific publication investigated the relationship of academic performance among adolescents with the changes caused by the pandemic. This survey observed that 55.0% ($n=122$) of its participants felt that their academic performance had worsened due to the changes in their life caused by the pandemic.

Lockdowns caused by the pandemic have led to a prolonged period of social isolation. Adolescents highly rely on their peers, and given the situation, social media was the means through which they could interact. 75.2% ($n=167$) of the survey participants agreed that they spent longer durations of time on social media/ entertainment platforms. 36.0% ($n=80$) even reported regularly spending more than 4 hours daily on these platforms. Given the importance of social interaction in the life of an adolescent, social media may be viewed as a positive coping strategy in these trying times [18].

The survey participants reported participating in multiple extracurricular activities like music, dance, art, storybooks, cooking, baking and many other activities as a way to cope with all the changes they were facing. Music was the most voted extracurricular activity with 82.0% ($n=182$) reporting to often use it to cope.

Conclusions

A cross sectional study was conducted in a school in Bangalore, India, via an online survey comprising 222 adolescent participants. The study highlights the psychological impact of the COVID-19 pandemic on adolescents in Bengaluru. According to DASS-21 scoring, 31.9% ($n=69$), 24.8% ($n=55$) and 5.4% ($n=12$) participants received scores indicating extremely severe depression, anxiety, and stress respectively. Females were statistically found to be more depressed and anxious than males. Behavioural disengagement and self-blame were commonly used coping mechanisms by those who were found to be psychologically distressed.

The results of this study were shared with the principal of the school. A workshop for the students with mental health specialists is set to be conducted. As the results of this study indicate high levels of psychological

distress among the participants, intervention through structured counselling may help address the challenges faced.

Future Research

A randomized study with a large sample size, including both urban and rural population, is suggested to assess the complete depth of the challenges that the adolescents of India face because of the COVID-19 pandemic. Furthermore, studies on the impact of structured counselling in such scenarios may help set guidelines for the future.

Limitations

This study was designed in English and required access to the internet to participate. This limited the study's population to adolescents living in urban areas who were versed with English. It included students from only one school. While participation was voluntary, the survey was shared by teachers to students. This brings in a possibility of selection bias.

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