Psychological Assessment and Sleep Pattern of Children During COVID-19 Pandemic in India: A Cross-Sectional Study

[1]Shweta, [2]Pooja Dahiya and [3]Anand Parashar
[1,2]*Department of Paediatrics Kalpana Chawla Govt. Medical College, Karnal, Haryana, India*
[3]*Department of Paediatrics Amrita Institute of Medical Science and Research Centre, Faridabad, Haryana, India*

Corresponding Author
Shweta,
Department of Paediatrics Kalpana Chawla Govt. Medical College, Karnal, Haryana, India
shweta.bbssmalik@gmail.com

Abstract

The COVID-19 pandemic had a profound impact on children's lives globally, including in India. The closure of schools, enforced social distancing and isolation measures significantly affected the psychological health and sleep patterns of children. This study investigates the impact of the COVID-19 pandemic on psychological health problems and sleep disturbances among children in India. This cross-sectional study involved 170 children aged 8-16 years, recruited from the pediatric outpatient department of Sri Balaji Action Medical Institute, New Delhi. Simple randomization was used to select participants. The Revised Child Anxiety and Depression Scale-Parent Version (RCADS-P) and the BEARS Questionnaire for sleep disturbances were utilized. Data collection involved offline questionnaires filled out by parents, and the data were analyzed using SPSS software. Statistical significance was set at $p<0.05$. of the 170 children, 54.71% were males and 45.29% were females. The majority (45.88%) were aged 11-13 years. Clinical depression was observed in 15.88% of the children, while 15.29% had clinical generalized anxiety. Separation anxiety was clinical in 12.35% and borderline in 7.06%. Social phobia, panic disorder and obsessive-compulsive disorder were less prevalent. Sleep problems were reported in 21.76% of the children. Significant associations were found between psychological problems and factors such as age, parents education level, socioeconomic status, area of residence, COVID-19 infection in family members and parents need to go to the workplace during the lockdown. The study revealed a high prevalence of anxiety, depression and sleep-related problems among children during the COVID-19 pandemic in India. This underscores the need for public health interventions targeting mental health issues in children and adolescents during and after the pandemic. Regular mental health assessments should be incorporated into pediatric care routines.

INTRODUCTION

The COVID-19 pandemic has posed unprecedented challenges to public health, particularly impacting the psychological well-being and sleep patterns of children. Globally, measures such as school closures, social distancing, and isolation have disrupted daily routines and support systems critical for children's mental health[1]. In India, where the pandemic's impact has been profound, the ramifications on children's psychological health are of significant concern. Children, a vulnerable group, have experienced increased anxiety, depression and sleep disturbances due to these drastic lifestyle changes[2].

Previous studies have highlighted that children are particularly susceptible to psychological stress during public health emergencies. Factors contributing to this include fear of infection, frustration due to confinement, lack of social interaction and the uncertainty surrounding the pandemic[3]. These stressors can lead to long-term psychological problems if not addressed timely and appropriately. For instance, prolonged school closures and home confinement can exacerbate anxiety and depressive symptoms in children, emphasizing the importance of early intervention[4].

The sleep patterns of children have also been adversely affected during the pandemic. Disrupted routines, increased screen time and heightened stress levels contribute to sleep disturbances, which in turn can exacerbate psychological issues[5]. The BEARS Questionnaire, a tool for assessing sleep problems in children, has shown a significant rise in sleep disturbances during the pandemic[6].

In the context of India, where access to mental health services is limited and stigmatized, the pandemic has intensified the need for effective mental health support for children. The present study aims to investigate the psychological health problems and sleep disturbances among children in India during the COVID-19 pandemic using standardized assessment tools like the Revised Child Anxiety and Depression Scale-Parent Version (RCADS-P) and the BEARS Questionnaire[6,7]. Understanding these impacts is crucial for developing targeted public health interventions to support the mental well-being of children during and after the pandemic.

MATERIALS AND METHODS

Study Design: This study is an observational cross-sectional study conducted to assess the psychological health problems and sleep disturbances among children during the COVID-19 pandemic in India. The study was carried out in the Pediatric Outpatient Department (OPD) of the Sri Balaji Action Medical Institute, Paschim Vihar, New Delhi.

Study Population: The study included 170 children aged 8-16 years, who visited the pediatric outpatient department of the Sri Balaji Action Medical Institute. The selection of children was done through simple randomization.

Inclusion Criteria:

- Children aged 8-16 years.

Exclusion Criteria:

- Children with developmental delays, intellectual disabilities, autism, or any history of anxiety disorders.

Sampling Technique: Randomized children, along with either of their parents, entering the pediatric OPD complex were included in the study and subjected to the questionnaire.

Data Collection Instruments:

- **Revised Child Anxiety and Depression Scale-Parent Version (RCADS-P):**
- The RCADS-P is a 47-item parent report used to assess symptoms of anxiety and depression in children.
- **It includes six subscales:** Separation Anxiety Disorder (SAD), Social Phobia (SP), Generalized Anxiety Disorder (GAD), Panic Disorder (PD), Obsessive-Compulsive Disorder (OCD), and Major Depressive Disorder (MDD).
- Items are rated on a 4-point Likert scale from 0 (never) to 3 (always).
- **BEARS Sleep Screening Tool:**
- BEARS is a 5-item screening tool that assesses sleep patterns and issues.
- **It covers five domains:** Bedtime issues, Excessive daytime sleepiness, Awakenings during the night, Regularity and duration of sleep and Snoring.

Procedure:

- The RCADS-P questionnaire was administered to the parents or caregivers of children aged 8-16 years.
- For uneducated parents, the questionnaire was translated into Hindi to ensure accurate data collection.
- The BEARS questionnaire was also administered to assess sleep disturbances in the children.

Study Location: Pediatric OPD in the Department of Pediatric and Neonatology at Sri Balaji Action Medical Institute, Paschim Vihar, New Delhi.

Sample Size Calculation: Based on a previous study by Sabina Yeasmin *et al.,* which observed that 43% of children had subthreshold mental disturbances, the minimum required sample size was calculated with a 7.5% margin of error and a 5% level of significance. The formula used was: $N=(p(1-p))(ME/Za)2N \geq \frac{(p(1-p))}{(ME/Z-{\alpha})^2}N=(ME/Za)2(p(1-p))$ where:

- ppp is the proportion of study subjects with subthreshold mental disturbances (0.43),
- $MEMEME$ is the margin of error (0.075),
- $ZaZ-{\alpha}Za$ is the Z-value for a 5% level of significance (1.96).

The calculated sample size was 168 and to reduce the margin of error, the total sample size taken was 170.

Data Collection Procedure:

- Primary data was collected via an offline questionnaire with a face-to-face interview.
- The questionnaire included sections on the child's information (age, sex, education level), socio-demographic information (place of living, number of earning members in the family, monthly income) and COVID-19 related questions (family member/relative/neighbor infected with COVID-19, need to go to the workplace, worried about financial condition).

Statistical Analysis:

- Categorical variables were presented as numbers and percentages.
- Quantitative data were presented as means±SD and as medians with interquartile ranges.
- The association of quantitative variables was analyzed using ANOVA.
- The association of qualitative variables was analyzed using the Chi-Square test or Fisher's exact test if any cell had an expected value of <5.
- Data entry was done using Microsoft EXCEL and final analysis was performed using SPSS software, version 21.0.
- A $p<0.05$ was considered statistically significant.

RESULTS AND DISCUSSIONS

The study was conducted on 170 children aged 8-16 years at the Pediatric OPD in the Department of Pediatric and Neonatology at Sri Balaji Action Medical Institute, New Delhi. The primary data was collected through an offline questionnaire with a face-to-face interview.

The mental health of the population is an essential component of any country, often overlooked, particularly in low-middle-income countries (LMICs) like India. This study aimed to evaluate the impact of the COVID-19 pandemic and its preventive measures on psychological health problems and sleep disturbances among children in India.

Our findings revealed that 27 (15.88%) children suffered from clinical depression and 26 (15.29%) had clinical generalized anxiety. The prevalence of separation anxiety was clinical in 21 (12.35%) children. Social phobia was relatively rare, with only one child each (0.59%) in the borderline and clinical categories. Panic disorder and obsessive-compulsive disorder were observed clinically in 6 (3.53%) children each. Sleep problems were present in 37 (21.76%) children.

Several studies have documented the prevalence and associated factors for psychological health problems during the COVID-19 pandemic. Yeasmin et al. (2020) found that 43% of children had subthreshold mental health disturbances[1]. Xie *et al.* (2020) reported depressive symptoms in 22.6% and anxiety symptoms in 18.9% of students[2]. Similarly, Garcia *et al.* (2020) observed a prevalence of anxiety of 19.4% based on the Children's Anxiety Questionnaire[3]. Our study's prevalence rates align with these findings, indicating a substantial impact of the pandemic on children's mental health.

Association with Demographic Characteristics
Age and Grade: The prevalence of clinical anxiety and depression was higher in the 14-16 years age group (50% and 48.15%, respectively) (p<0.0001). This is consistent with Duan *et al.* (2020), who found higher anxiety levels among adolescents compared to younger children[4]. The positive association between age and mental health issues could be attributed to the surge in COVID-19 cases and deaths, leading to increased concern among older children about their well-being and that of their family members.

Gender: Our study did not find a significant difference in the prevalence of anxiety and depression between males and females (p=0.347). This contrasts with some studies, such as Zhou *et al.* (2020), which reported higher anxiety and depression levels among females[5]. However, Garcia *et al.* (2020) found no significant difference in anxiety prevalence between boys and girls, aligning with our findings[3].

Association with Parents' Characteristics:
Parents' Education: A higher level of parental education was significantly associated with higher anxiety and depression in their children (p=0.01). This could be due to increased awareness and concern

Table 1: Distribution of Demographic Characteristics of Study Subjects

Demographic Characteristics	Frequency	Percentage (%)
Age (years)		
8-10	61	35.88
11-13	78	45.88
14-16	31	18.24
Mean±SD	11.48 ± 2.2	
Median (25th-75th percentile)	11 (10-13)	
Gender		
Female	77	45.29
Male	93	54.71
Grade		
3rd to 5th grade	62	36.47
6th to 8th grade	81	47.65
9th to 10th grade	24	14.12
11th grade	3	1.76

Table 2: Distribution of Socio-Demographic Characteristics of Parents of Study Subjects

Socio-Demographic Characteristics	Frequency	Percentage (%)
Father's Education		
Illiterate	4	2.38
Primary	20	11.90
High school	38	22.62
Intermediate	35	20.83
Graduate	63	37.50
Postgraduate	8	4.76
Mother's Education		
Illiterate	14	8.24
Primary	26	15.29
High school	48	28.24
Intermediate	40	23.53
Graduate	38	22.35
Postgraduate	4	2.35
Socio-economic Class		
Upper class	65	38.24
Upper middle	27	15.88
Lower middle	46	27.06
Upper lower	25	14.71
Lower class	7	4.12
Area of Residence		
Rural	16	9.41
Urban	154	90.59

Psychological Assessment (RCADS-P Scores)

Table 3: Distribution of RCADS-P Scores of Study Subjects

RCADS-P Subscales	Frequency	Percentage (%)	Mean ± SD	Median (25th-75th percentile)	Range
Social Phobia			37.52 ± 9.2	35 (31-40)	24-71
Normal	168	98.82			
Borderline	1	0.59			
Clinical	1	0.59			
Panic Disorder			45.8 ± 8.98	42 (41-47)	37-80
Normal	159	93.53			
Borderline	5	2.94			
Clinical	6	3.53			
Major Depression			48.26 ± 14.78	42 (39-51)	29-80
Normal	139	81.76			
Borderline	4	2.35			
Clinical	27	15.88			
Separation Anxiety			50.28 ± 13.26	46 (40-58)	36-80
Normal	137	80.59			
Borderline	12	7.06			
Clinical	21	12.35			
Generalized Anxiety			46.09 ± 15.21	40 (36.25-46.75)	27-80
Normal	141	82.94			
Borderline	3	1.76			
Clinical	26	15.29			
Obsessive Compulsive			45.66 ± 8.18	42 (42-47)	35-80
Normal	159	93.53			
Borderline	5	2.94			
Clinical	6	3.53			

Total Anxiety and Depression Scores

Table 4: Distribution of Total Anxiety Scale of Study Subjects

Total Anxiety	Frequency	Percentage (%)	Mean±SD	Median (25th-75th percentile)	Range
Normal	164	96.47	42.61 ± 11.15	39 (34-50.75)	26-80
Borderline	2	1.18			
Clinical	4	2.35			

Table 5: Distribution of Total Anxiety and Depression of Study Subjects

Total Anxiety and Depression	Frequency	Percentage (%)	Mean ± SD	Median (25th-75th percentile)	Range
Normal	152	89.41	43.7 ± 12.36	39 (35-51)	25-80
Borderline	13	7.65			
Clinical	5	2.94			

Sleep Pattern (BEARS Scale)

Table 6: Distribution of BEARS Scale for Sleep Pattern of Study Subjects

Bears Scale	Frequency	Percentage (%)
No	133	78.24
Yes	37	21.76

Association of Demographic Characteristics with Major Depression

Table 7: Association of Demographic Characteristics with Major Depression

Demographic Characteristics	Normal (n=139)	Borderline (n=4)	Clinical (n=27)	Total (n=170)	p-value
Age (years)					
8-10	58 (41.73%)	2 (50%)	1 (3.70%)	61 (35.88%)	<0.0001*
11-13	63 (45.32%)	2 (50%)	13 (48.15%)	78 (45.88%)	
14-16	18 (12.95%)	0 (0%)	13 (48.15%)	31 (18.24%)	
Mean ± SD	11.13 ± 2.07	11.23 ± 1.52	13.28 ± 1.97	11.48 ± 2.18	<0.0001†
Gender					0.347*
Female	60 (43.17%)	3 (75%)	14 (51.85%)	77 (45.29%)	
Male	79 (56.83%)	1 (25%)	13 (48.15%)	93 (54.71%)	
Grade					<0.0001*
3rd to 5th grade	59 (42.45%)	2 (50%)	1 (3.70%)	62 (36.47%)	
6th to 8th grade	65 (46.76%)	2 (50%)	14 (51.85%)	81 (47.65%)	
9th to 10th grade	14 (10.07%)	0 (0%)	10 (37.04%)	24 (14.12%)	
11th grade	1 (0.72%)	0 (0%)	2 (7.41%)	3 (1.76%)	

* Fisher's exact test, † ANOVA

Association of Socio-Demographic Characteristics of Parents with Major Depression

Table 8: Association of Socio-Demographic Characteristics of Parents with Major Depression

Socio-Demographic Characteristics of Parents	Normal (n=139)	Borderline (n=4)	Clinical (n=27)	Total (n=170)	p-value
Father's Education					0.024*
Illiterate	3 (2.19%)	0 (0%)	1 (3.70%)	4 (2.38%)	
Primary	14 (10.22%)	1 (25%)	5 (18.52%)	20 (11.90%)	
High school	35 (25.55%)	2 (50%)	1 (3.70%)	38 (22.62%)	
Intermediate	31 (22.63%)	1 (25%)	3 (11.11%)	35 (20.83%)	
Graduate	48 (35.04%)	0 (0%)	15 (55.56%)	63 (37.50%)	
Postgraduate	6 (4.38%)	0 (0%)	2 (7.41%)	8 (4.76%)	
Mother's Education					0.039*
Illiterate	9 (6.47%)	0 (0%)	5 (18.52%)	14 (8.24%)	
Primary	22 (15.83%)	2 (50%)	2 (7.41%)	26 (15.29%)	
High school	43 (30.94%)	2 (50%)	3 (11.11%)	48 (28.24%)	
Intermediate	33 (23.74%)	0 (0%)	7 (25.93%)	40 (23.53%)	
Graduate	28 (20.14%)	0 (0%)	10 (37.04%)	38 (22.35%)	
Postgraduate	4 (2.88%)	0 (0%)	0 (0%)	4 (2.35%)	
Socio-economic Class					0.146*
Upper class	50 (35.97%)	0 (0%)	15 (55.56%)	65 (38.24%)	
Upper middle	24 (17.27%)	0 (0%)	3 (11.11%)	27 (15.88%)	
Lower middle	39 (28.06%)	3 (75%)	4 (14.81%)	46 (27.06%)	
Upper lower	21 (15.11%)	1 (25%)	3 (11.11%)	25 (14.71%)	
Lower class	5 (3.60%)	0 (0%)	2 (7.41%)	7 (4.12%)	
Area of Residence					0.647*
Rural	15 (10.79%)	0 (0%)	1 (3.70%)	16 (9.41%)	
Urban	124 (89.21%)	4 (100%)	26 (96.30%)	154 (90.59%)	

* Fisher's exact test

Association of Infection with COVID-19 with Major Depression

Table 9: Association of "Infected with COVID or not" with Major Depression

"Infected with COVID or not"	Normal (n=139)	Borderline (n=4)	Clinical (n=27)	Total (n=170)	p-value
No	116 (83.45%)	1 (25%)	12 (44.44%)	129 (75.88%)	<0.0001*
Yes	23 (16.55%)	3 (75%)	15 (55.56%)	41 (24.12%)	
Total	139 (100%)	4 (100%)	27 (100%)	170 (100%)	

* Fisher's exact test

Association of "Need to go to Workplace" with Major Depression

Table 10: Association of "Need to go to Workplace" with Major Depression

"Need to go to Workplace"	Normal (n=139)	Borderline (n=4)	Clinical (n=27)	Total (n=170)	p-value
No	120 (86.33%)	4 (100%)	15 (55.56%)	139 (81.76%)	0.002*
Yes	19 (13.67%)	0 (0%)	12 (44.44%)	31 (18.24%)	
Total	139 (100%)	4 (100%)	27 (100%)	170 (100%)	

* Fisher's exact test

Association of "Worried about Financial Condition" with Major Depression

Table 11: Association of "Worried about Financial Condition" with Major Depression

"Worried about Financial Condition"	Normal (n=139)	Borderline (n=4)	Clinical (n=27)	Total (n=170)	p-value
No	92 (66.19%)	0 (0%)	19 (70.37%)	111 (65.29%)	0.026*
Yes	47 (33.81%)	4 (100%)	8 (29.63%)	59 (34.71%)	
Total	139 (100%)	4 (100%)	27 (100%)	170 (100%)	

* Fisher's exact test

Association of Sleep Disturbances with Psychological Health Problems

Table 12: Association of RCADS-P Scores with Sleep Problems

RCADS-P Scores	Sleep Problems Absent (n=133)	Sleep Problems Present (n=37)	Total (n=170)	p-value
Social Phobia				0.046*
Normal	133 (79.17%)	35 (20.83%)	168 (100%)	
Borderline	0 (0%)	1 (100%)	1 (100%)	
Clinical	0 (0%)	1 (100%)	1 (100%)	
Panic Disorder				0.02*
Normal	128 (80.50%)	31 (19.50%)	159 (100%)	
Borderline	2 (40%)	3 (60%)	5 (100%)	
Clinical	3 (50%)	3 (50%)	6 (100%)	
Major Depression				<0.0001*
Normal	124 (89.21%)	15 (10.79%)	139 (100%)	
Borderline	2 (50%)	2 (50%)	4 (100%)	
Clinical	7 (25.93%)	20 (74.07%)	27 (100%)	
Separation Anxiety				<0.0001*
Normal	119 (86.86%)	18 (13.14%)	137 (100%)	
Borderline	7 (58.33%)	5 (41.67%)	12 (100%)	
Clinical	7 (33.33%)	14 (66.67%)	21 (100%)	
Generalized Anxiety				<0.0001*
Normal	122 (86.52%)	19 (13.48%)	141 (100%)	
Borderline	1 (33.33%)	2 (66.67%)	3 (100%)	
Clinical	10 (38.46%)	16 (61.54%)	26 (100%)	
Obsessive Compulsive				0.015*
Normal	128 (80.50%)	31 (19.50%)	159 (100%)	
Borderline	3 (60%)	2 (40%)	5 (100%)	
Clinical	2 (33.33%)	4 (66.67%)	6 (100%)	

* Fisher's exact test

among educated parents about the pandemic's implications, as observed by Yeasmin *et al.* (2020) and Garcia[1,3].

Socioeconomic Class: Children from upper-class families had higher anxiety levels (61.54%, p=0.002) but no significant difference in depression levels (55.56%, p=0.146). This may be because upper-class families faced greater disruption to their lifestyle and routines, leading to increased anxiety among children.

Area of Residence: The prevalence of anxiety was significantly higher among children in urban areas (96.15%, p=0.024). This finding is supported by Yeasmin *et al.* (2020), who found higher depression, anxiety and sleep disorder scores among urban children[1]. The strict lockdown measures in urban areas may have contributed to this increased anxiety.

Association with COVID-19 Infection: Children with family members infected with COVID-19 had significantly higher rates of clinical depression (55.56%, p<0.0001) and clinical generalized anxiety (61.54%, p<0.0001). This aligns with Duan *et al.* (2020), who found increased anxiety levels among those with infected family members[4]. The fear of infection and concern for the infected relative likely contributed to these elevated anxiety and depression levels.

Association with Parents' Work and Financial Concerns: Children whose parents needed to go to the workplace had higher rates of clinical depression (44.44%, p=0.002) and generalized anxiety (42.31%, p=0.004). This is consistent with Yeasmin *et al.* (2020), who observed higher depression, anxiety and sleep disorder scores among children whose parents continued working during the lockdown[1]. The

increased risk of infection and reduced parental presence likely heightened these children's anxiety and depression levels.

Association with Sleep Disturbances: Sleep disturbances were significantly associated with higher rates of depression, anxiety and stress. Children with clinical depression had a 74% prevalence of sleep problems (p<0.001), while those with clinical separation anxiety and generalized anxiety had 66.67% and 61.54% prevalence, respectively (p<0.001). Cui *et al.* (2021) also found that sleep disturbances were positively related to depression, anxiety and stress[6].

CONCLUSION

The COVID-19 pandemic has significantly impacted children's psychological health and sleep patterns in India. Higher prevalence rates of anxiety, depression, and sleep-related problems highlight the need for targeted public health interventions. Regular mental health assessments for children should be integrated into routine pediatric care, particularly during and after pandemic-related disruptions. Longitudinal studies are necessary to understand the long-term effects of the pandemic on children's mental health.

REFERENCES

1. Yeasmin, S., R. Banik, S. Hossain, M.N. Hossain, R. Mahumud, N. Salma and M.M. Hossain, 2020. Impact of COVID-19 pandemic on the mental health of children in Bangladesh: A cross-sectional study. Child Youth Serv. Rev., Vol. 117 .10.1016/j.childyouth.2020.105277.
2. Xie, X., Q. Xue, Y. Zhou, K. Zhu, Q. Liu, J. Zhang and R. Song, 2020. Mental health status among children in home confinement during the coronavirus disease 2019 outbreak in hubei province, China. JAMA Pedia., 174: 898-900.

3. de Avila, M.G., P.H. Filho, F. Jacob, L. Alcantara and M. Berghammer et al., 2020. Children's anxiety and factors related to the COVID-19 pandemic: An exploratory study using the children's anxiety questionnaire and the numerical rating scale. Int. J. Environ. Res. Public Health, Vol. 17, No. 16 .10.3390/ijerph17165757.

4. Duan, L., X. Shao, Y. Wang, Y. Huang, J. Miao, X. Yang and G. Zhu, 2020. An investigation of mental health status of children and adolescents in China during the outbreak of COVID-19. J. Affec Disord., 275: 112-118.

5. Zhou, S.J., L.L. Wang, R. Yang, X.J. Yang and L.G. Zhang et al., 2020. Sleep problems among Chinese adolescents and young adults during the coronavirus-2019 pandemic. Sleep Med., 74: 39-47.

6. Tang, S., M. Xiang, T. Cheung and Y.T. Xiang, 2021. Mental health and its correlates among children and adolescents during COVID-19 school closure: The importance of parent-child discussion. J. Affec Disord., 279: 353-360.

7. Cui, Y., Y. Li and Y. Zheng, 2021. Mental health services for children in China during the COVID-19 pandemic: results of an expert-based national survey among child and adolescent psychiatric hospitals. Eur Child Adolesc Psyc., 30: 731-738.

8. Oosterhoff, B., C.A. Palmer, J. Wilson and N. Shook, 2020. Adolescents' motivations to engage in social distancing during the COVID-19 pandemic: Associations with mental and social health. J. Adolesc. Heal., 67: 179-185.

9. Helgeson, V.S., K.A. Reynolds and P.L. Tomich, 2006. A meta-analytic review of benefit finding and growth.. J. Consu Clin. Psychol., 74: 797-816.