Prevalence of Psychosocial Problems among School-going Children aged 4-10 Years: A Cross-sectional Study

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ABSTRACT

Introduction: A substantial proportion of the Indian population comprises children under 15 years of age. The prevalence of psychosocial disorders in children is increasing, coinciding with a decrease in infection-related morbidities. Psychosocial disorders may not only have short-term effects but also have long-lasting effects on the child's well-being.

Aim: To assess the prevalence of psychosocial disorders in children aged 4-10 years and compare it before and after the COVID-19 pandemic.

Materials and Methods: This cross-sectional study was conducted as an online survey originating from Rukmani Birla Hospital, a tertiary care centre in Jaipur, Rajasthan, India. A total of 171 children aged between 4-10 years were included in the study, from February 2021 to June 2021. A structured survey questionnaire was distributed using Google Forms. The Childhood Psychopathological Measurement Schedule (CPMS) was used to assess psychosocial problems in children. CPMS scoring was performed for both the pre-pandemic period (before March 2020) and the post-pandemic period (from March 2020 until the form was filled out) for the same children.

The Chi-square test was used to compare the association of demographic variables with the CPMS score. Statistical Package for the Social Sciences (SPSS) version 20.0 was used for statistical analysis.

Results: The mean age of the children was 6.82±2.06 years, with 47.4% (81/171) being females. A majority of the children, 158 (92.4%), were from an urban setting. The average CPMS score significantly increased from 6.66±7.46 to 11.9±10.8 (p-value <0.05) after one year of the COVID-19 pandemic. Before the pandemic, 28 (16.37%) children had an abnormal CPMS score, while after the pandemic, 73 (42.69%) had an abnormal score. Prior to the pandemic, 96 (56.14%) children had a screen time of 1-2 hours per day, but after the pandemic, 94 (55%) had a screen time of more than four hours. Psychosocial problems were significantly higher in nuclear families before the pandemic (p-value <0.05) and significantly higher in children with increased screen time after the pandemic (p-value <0.01).

Conclusion: The COVID-19 pandemic has led to an increase in psychosocial disorders among children. There is an urgent need to address these issues in children at an early stage so that early interventions can be implemented.

Keywords: Anxiety, Behavioural disorder, Childhood psychopathological measurement schedule score, Depression, Pandemic

INTRODUCTION

Children under the age of 15 years comprise 27% of the Indian population [1]. According to estimates by the World Health Organisation (WHO), a significant portion of global diseases is due to neurological, mental, and behavioural disorders [2]. Almost 50% of neuropsychiatric disorders are estimated to onset by the age of 14 years [3]. Early childhood, up to 14 years of age, is considered the most important stage of development. This is a stage where children take an interest in all activities if they are presented in a way they can understand. Experiences gained during this period play an essential role in their behaviour in later years of life. Early childhood development has a significant influence on a child's future and is considered one of the most sensitive and formative periods in one's life. Any action or response of a person to external or internal stimuli constitutes their behaviour. There are many influencers on a child's behaviour, including parents, siblings, teachers, etc. Any deviation from the accepted pattern of behaviour based on the child's age is a marker of a behavioural problem. A child faces a lot of stress and difficulty if they cannot adjust or cope with meeting environmental demands. It may have a strong psychological impact on the child's growth and personality. Some behaviours are considered normative at certain ages, such as mild tantrums in preschoolers, community studies of which show a high incidence of 80%, but only 10% have daily tantrums [4].

Emotional difficulties and challenging behaviours are usually transient and not noticeable before the age of two [5]. Identifying and intervening in behavioural disorders can be difficult but may seriously affect a child's development if overlooked [6].

Behavioural problems among school-going children have immediate and long-term unfavourable consequences, not only for the child's future from an individual perspective but also for society as a whole from a larger perspective. As infant and childhood mortality rates decline, there has been an observed increase in the incidence of intellectual and psychological morbidities in children [7]. A portion of this rise in the incidence of such psychosocial problems may be attributed to increased awareness and improved diagnosis of these ailments. Common psychosocial and behavioural problems reported during the pandemic include inattention, clinginess, distraction, and fear of the pandemic, with an increased risk in children with prior mental illness [8]. Therefore, child psychiatric epidemiology plays a vital role in investigating the psychological health of a large population of children [9].

Although many studies have been conducted in India to assess the psychosocial well-being of adolescents and their behavioural problems, studies on psychosocial problems in early childhood are lacking, despite the high prevalence of such issues. Since early childhood is a crucial time for a child's cognitive and behavioural development, it is essential to prioritise such studies to create better awareness and interventions for these children.

Therefore, the present study aimed to assess the effect of the COVID-19 pandemic on the psychosocial behaviour of children between the ages of 4-10 years and identify the socio-demographic factors influencing it.

MATERIALS AND METHODS

This cross-sectional study was conducted using a self-administered structured questionnaire to be filled out by the parents. The questionnaire was distributed online via a Google form. The study received approval from the Institutional Ethical Committee (IEC) of Rukmani Birla Hospital, Jaipur, under letter number RBH/IEC/20/004(a) before enrolling subjects. Subject enrollment was conducted from February 2021 to June 2021.

Inclusion criteria: Children between the ages of 4-10 years were included in the study after obtaining parental consent.

Exclusion criteria: Children diagnosed with any psychiatric illness, neurological disorder, chronic medical illness, or those who did not provide consent were excluded from the study.

Sample size: To determine the proportion of psychosocial morbidities in school-going children, considering an anticipated proportion of 20% based on previously reported studies [10], with a margin of error of 6%, a 90% confidence interval, a width of 10%, and an α-level of significance of 5%, the calculated sample size was 171.

Two time spans were defined:

1. Pre-COVID-19: Before the onset of the COVID-19 pandemic, from March 2019 to March 2020.
2. Post-COVID-19 pandemic onset: After the start of the COVID-19 pandemic, from March 2020 to March 2021.

Parents of the children were contacted through social media platforms like WhatsApp, Gmail, etc., and those who gave consent and met the inclusion criteria were enrolled in the study. Parents/caretakers were advised to report significant changes in behaviour observed before and after the start of the pandemic. The questionnaire took approximately 10-15 minutes to complete. The prepandemic data was filled in based on recall.

Psychosocial problems were assessed using the CPMS [11], which is an Indian adaptation of the Child Behaviour Checklist (CBCL). CPMS is available in both English and Hindi and measures 75 behavioural problem items using a yes-no response scale rated as 1 and 0. It can be used for children between the ages of 4-15 years of both sexes.

The CPMS consists of eight factors:

a. Low intelligence with behaviour problems
b. Conduct disorders
c. Anxiety
d. Depression
e. Psychotic symptoms
f. Special symptoms
g. Physical illness with emotional problems
h. Somatisation

Scores from the various factors are added to arrive at a factor score. CPMS can be used as a screening instrument with a cutoff score of 10 and above indicating a psychiatric disorder with 87% specificity and 82% sensitivity [11].

STATISTICAL ANALYSIS

The collected data was transferred to an Excel sheet, cleaned, coded, and checked for completeness. Descriptive data were expressed as mean±SD, medians (range), proportions, and frequencies. Children identified with significant problems were compared to those without such problems based on their CPMS scores, specifically those with a score <10 and those with a score >10. The Chi-square test was used to determine the dependency of different demographic characteristics on the psychosocial score. For a large sample, the z-test was used to compare the proportion rate of psychosocial factor scores between the pre-COVID-19 and post-COVID-19 periods. The Wilcoxon Sign-Ranked test was used to compare psychosocial factor scores before

and after the pandemic. All statistical analyses were performed using SPSS Version 20.0 for Windows. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 171 children were enrolled in the study. Out of the 171 children, 28 children had a psychosocial score of 10 or more before the pandemic, while 143 had a score of less than 10. After one year of the pandemic, 73 children had a psychosocial score of 10 or more, and 98 children had a score of less than 10. Therefore, the prevalence of psychosocial problems in school-going children increased from 16.37% (28 out of 171 children) to 42.69% (73 out of 171 children) after one year of the pandemic.

As shown in [Table/Fig-1], out of the 171 children enrolled in the study, the highest percentage (19.3%) were four years old, followed by 10 years old, with a mean age of 6.82±2.06 years. However, no significant difference was found in psychosocial problems among different age groups during both periods.

Parameters		N (%)
Sex	Female	81 (47.4)
	Male	90 (52.6)
Age (in years)	4	33 (19.3)
	5	21 (12.3)
	6	21 (12.3)
	7	34 (19.9)
	8	22 (12.9)
	9	11 (6.4)
	10	29 (17.0)
Family type	Nuclear	75 (43.9)
	Joint	96 (56.1)
Residence	Urban	158 (92.4)
	Rural	13 (7.6)
Number of siblings	0	65 (38.0)
	1 or more	106 (62.0)
Screen time (in hours)	**Prepandemic** 1-2	96 (56.1)
	2-4	67 (39.2)
	4-6	6 (3.50)
	>6	2 (1.2)
	Postpandemic >1-2	15 (8.8)
	>2-4	62 (36.3)
	>4-6	55 (32.2)
	>6	39 (22.80)

[Table/Fig-1]: Demographic parameters.

As shown in [Table/Fig-2], there was a significant increase in the CPMS score after the pandemic. In [Table/Fig-3], during the pre-COVID-19 period, girls were found to have more behavioural problems than boys (17.2% vs 15.6%). After one year of the COVID-19 pandemic, females still had more behavioural problems than boys (46.9% vs 38.9%), but there was a significant increase in behavioural problems in both groups. There was no significant difference in the prevalence of behavioural problems based on gender during both the pre-COVID-19 period and one year after the COVID-19 pandemic. Additionally, there was no significant difference in behavioural problems based on residence. Psychosocial problems were significantly higher in nuclear families than in joint families during

Characteristics	Prepandemic	Postpandemic	Wilcoxon Sign-Ranked test	p-value
Mean	6.66±7.46	11.90±10.89	-9.06	0.00001

[Table/Fig-2]: CMPS score pre- and postpandemic.

Variable		Prepandemic				Postpandemic			
		Scores		χ² value	p-value	Scores		χ² value	p-value
		<10	≥10			<10	≥10		
Sex	Female	67 (82.72)	14 (17.28)	0.093	0.7604	43 (53.09)	38 (46.91)	1.122	0.28947
	Male	76 (84.44)	14 (15.56)			55 (66.11)	35 (38.89)		
Age (years)	4-6	64 (85.33)	11 (14.67)	1.643	0.43979	42 (56.0)	33 (44.0)	0.1715	0.9178
	7-8	44 (78.57)	12 (21.43)			32 (57.14)	24 (42.86)		
	9-10	35 (87.50)	5 (12.50)			24 (60.0)	16 (40.0)		
Family type	Nuclear	58 (77.33)	17 (22.67)	3.863	0.04936	38 (50.67)	37 (49.33)	2.41	0.12057
	Joint	85 (88.54)	11 (11.46)			60 (62.5)	36 (37.5)		
Sibling	0	59 (90.77)	6 (9.23)	3.91	0.04807	42 (64.62)	23 (35.38)	2.702	0.10026
	1 or more	84 (79.25)	22 (20.75)			56 (52.83)	50 (47.17)		

[Table/Fig-3]: Analysis of demographic variables and psychosocial disorders.
Test applied *Chi-square

the pre-COVID-19 period (22.67% vs 11.45%, p-value=0.049), but there was no significant difference during the post-COVID-19 period (49.33% vs 37.5%, p-value=0.12).

In the pre-pandemic period, children with one or more siblings had significantly more behavioural problems than single children (9.23% vs 20.75%, p-value=0.048). However, after one year of the COVID-19 pandemic, there was no significant difference between these groups (35.38% vs 47.17%, p-value=0.100).

As shown in [Table/Fig-4], out of the 171 children enrolled in the study, during the pre-COVID-19 period, the majority of 96 children (56.14%) had screen time of 1-2 hours per day. However, after the pandemic, 94 children (55%) had screen time of more than four hours. After conducting a comparative analysis of the effect of screen time on children, it was found that the effect of screen time on psychosocial problems was highly significant. Therefore, an increase in screen time was found to have a detrimental effect on the mental health of children.

Screen time (in hours)	Prepandemic (28 children)	Postpandemic (73 children)	t-test	p-value
1-2	22	7	2.948	0.003415
2-4	5	26	-4.049	0.000064
4-6	1	21	-4.539	0.000008
More than 6	0	19	-4.623	0.000005

[Table/Fig-4]: Comparing proportion rate of psychosocial problem in comparison of screen time between pre-COVID-19 and post-COVID-19 onset.
*Paired t-test

DISCUSSION

Estimating and comparing the prevalence of various childhood behavioural disorders worldwide in different age groups is challenging. The prevalence rates vary due to differences in research methodologies and the use of varying definitions. Most studies report a prevalence of Mental Health Disorders (MHD) between 10% and 20% in the Child and Young Population (CYP) [12]. These rates are similar across different racial and ethnic groups. Poverty and low socio-economic status are risk factors that appear to increase the rate of MHDs across populations [13]. According to a 2001 report by the World Health Organisation (WHO), the six-month prevalence rate for any MHD in children below 17 years of age is 20.9%, with Disruptive Behaviour Disorders (DBD) being the most common at 10.3% [14]. In its recent 2021 report, WHO stated that globally, one out of every seven adolescents between the ages of 10-19 experiences some form of mental health problem, accounting for 13% of the global disease burden [15]. In this study, the prevalence of psychosocial problems was 16.37%.

With the increasing prevalence of MHDs and the lack of awareness among parents, pediatricians play a crucial role in recognising red flag signs and screening all children they come into contact

with. While parents may report behavioural problems as the primary complaint, it is often seen that the problem behaviour is a consequence of an underlying neurodevelopmental condition. Therefore, any child presenting with behavioural problems requires a comprehensive neurodevelopmental evaluation using standardised tools. After completing the neurodevelopmental assessment, mental health practitioners may ask parents or teachers to rate the child's behaviour using standardised tools such as The Achenbach CBCL [16], The Conners' Rating Scales [17], and The Behaviour Assessment System for Children (BASC) [18]. Treatment modalities after appropriate diagnosis include parental training, applied behaviour therapy, cognitive behaviour therapy, and pharmacological treatment depending on the underlying disorder.

There have been significant concerns regarding the impact of the COVID-19 pandemic on the mental health of children, and numerous studies have been conducted to assess this. Emerging research suggests a substantial increase in the prevalence of mental health and behavioural problems in children after the COVID-19 pandemic. In the present study, the prevalence of psychosocial problems in school-going children increased from 16.37% to 42.69% after one year of the COVID-19 pandemic.

Racine et al., conducted a meta-analysis on the global prevalence of depression and anxiety in children and adolescents during COVID-19. The age limit of the studies included children and adolescents below 18 years of age. They found that in the first year of the pandemic, one out of every four youths globally experienced depressive symptoms, while one out of five youths experienced elevated anxiety symptoms [19]. Golberstein et al., concluded in their study that the pandemic had a negative impact on children's mental health, resulting in increased symptoms of anxiety, depression, and other behavioural problems such as hyperactivity and aggression [20]. In an online study by Christner et al., most parents reported stress related to the lockdown, with the primary challenge being the inability to meet family and friends outside the household. Older children experienced more emotional symptoms, while younger children exhibited hyperactivity-related and conduct problems. Single children or single parents also increased the levels of child's problems [21]. Jiao et al., reported that younger children were more likely to manifest behavioural problems such as clinginess and fear of family members contracting the infection. The most severe psychological conditions observed across all age groups were clinginess, inattention, and irritability [22]. The present study also revealed an increase in behavioural issues after the COVID-19 pandemic.

A two-wave nationwide population-based study conducted by Ravens-Sieberer et al., concluded that emotional problems, peer-related mental health problems, depression, anxiety, and other psychosomatic problems significantly increased in children and adolescents during the pandemic. Although there was not

much change in mental health problems from wave 1 to wave 2. Underprivileged children whose parents had mental health problems were at a high risk of developing behavioural problems [23]. A Chinese study revealed that 22.6% of children and adolescents had depressive symptoms, and 18.9% of students reported symptoms of anxiety. Children in Wuhan had significantly higher scores compared to other cities in China [24].

Psychosocial problems were also significantly higher in children with increased screen time during the post-COVID-19 period. An increase in screen time due to confinement at home showed a strong correlation with behavioural issues. Monterio et al., investigated the relationship between increased screen time during the COVID-19 pandemic and emotional and behavioural problems in children under the age of seven. They concluded that there was a significant relationship between children's exposure to multiple screens, the duration of screen time, and behavioural and emotional problems in the study population. The study emphasised the important role of parents in children's behavioural and emotional adjustment during the confinement period [25]. The present study had similar findings, with an increase in screen time being a significant factor in the detrimental mental health of children.

Limitation(s)

Considering the fact that this study was conducted after one year of the COVID-19 pandemic, it is important to note that recalling behavioural problems from the pre-COVID-19 period may be prone to recall bias.

CONCLUSION(S)

The current study brings awareness to the magnitude of psychosocial and behavioural problems in children and highlights the impact of the COVID-19 pandemic on their mental health. The study found a significant increase in psychosocial problems among children, as well as a notable rise in screen time. It is crucial to address and limit children's screen time, and this can be achieved through awareness campaigns targeting parents. These campaigns should focus on promoting effective parenting skills to manage and mitigate behavioural problems, as well as educating parents about safe screen practices, which include setting limits on screen time.

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