

A Study to Understand the Effect of Emotional and Behavioural Problems on the Sleep Health of School - Age Children, During the Pandemic Lockdown

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Abstract

Objectives: The study aims to understand the trend of sleep health in children of school age focusing on their sleep schedule and quality during the pandemic and its association with emotional and behavioral problems on sleep patterns in children.

Methods: The study has been designed in a randomized survey-based cross-sectional format, conducted across the social media platform. The study sample consisted of 78 school-age children within the age range of 6 -12 years (M = 8.91) and their mothers as respondents who were sampled following the screening criteria. The Sleep Disturbance Scale in Children (SDSC), Strength and Difficulties Questionnaire (SDQ), and a self-rated scale for Sleep Schedule and Quality (SCQ) were used for the study.

Results: Results indicate that there is a significant correlation found among the scores of SDSC and SDQ subtests and total scores ($r = 0.55$; $p > 0.01$). This indicates that sleep disturbance is significantly related to emotional and behavioral problems in children. Significant changes in sleep quality and schedule of the children have been found on comparison of pre and post lockdown conditions; also significance found between SDSC and SCQ ($r = -0.36$; $p > 0.01$) as well as SCQ and SDQ subtests and total difficulty score ($r = -0.33$; $p > 0.01$), indicates that sleep schedules have a relationship with sleep disturbance and emotional and behavioral problems in school-age children. Findings indicated that sleep disturbance has a direct impact on the problems caused in the children's behavior accounting for 30% of the variance for sleep disturbances.

Conclusion: Children of school-going age have showed significant sleep disturbance along with significant emotional and behavioral disturbances during the second wave of COVID outbreak in India. The present study indicated that, there has been a major change in sleep quality and schedule of the children in comparison of pre to post lockdown conditions in children of 6-12 years, and emotional and behavioral disturbances, associated both with sleep disturbance and sleep schedule change in children were also prominent in the sample.

Keywords: Sleep Health; Emotional and Behavioral Disturbances; Sleep Quality and Schedule; School-age; Lockdown

Abbreviations

SDSC: Sleep Disturbance Scale in Children; SDQ: Strength and Difficulties Questionnaire; SCQ: Sleep Schedule and Quality

Introduction

Sleep is one of the vital components of our daily routine. Quality sleep is just as important for good health as proper nutrition and physical activities. A minimum of 8 to 10 hours of night-time sleep is a requirement in children of school age to regulate their physiological and mental health (Ferber, 1985). There is some consensus that the stage of slow wave sleep (SWS) or deep sleep is restorative (Horne, 1992) as growth hormones are released during this stage. Cross-sectional surveys of Canadian high school students reported that up to 70% of students get less than the recommended amount of sleep for their age [1]. Disturbed or inadequate sleep has a pervasive negative impact on the health, cognitive functioning, emotion regulation, and quality of life of children.

In the current global scenario, the COVID-19 Pandemic outbreak and its associated societal response is thought to have wide-ranging impacts on the biopsychosocial health of the children. Children have a significant separation from social systems and a redefinition of daily habits within the family, and with schools, and recreational sources shut, it has been difficult for the younger population to adapt to the confinement and its restrictions, increasing their loneliness, negative affect, and increased duration of daily screen time use [2,3]. Tsai, *et al.* 2018 [4]. Studies conducted by Author Oliviero *et al.*, 2021, on the changes in sleep patterns and disturbances in children and adolescents in Italy during the lockdown, have indicated that home confinement has led to substantial changes in the lifestyle of children, adolescents, as well their families with disrupted decorum in a routine and sleep/wake schedule [5]. However, although a very important area, only few studies have been conducted that has specifically focused on sleep disturbances and its behavioral and psychological effects on children. More importantly, the children belonging to the middle school range (between 6 to 12 years) as this is the time when peer activities and socialization increases in children and they involve in peer play and learning activities to maximum.

The purpose of this study, thereby, was to understand the trend of sleep health (shifts/disturbances caused in their sleep patterns, if any) in children of middle school (6 - 12 years), focusing on their sleep schedule and quality during the pandemic. The study also aimed to see the relation of sleep pattern/disturbance with the emotional and behavioral problems in children.

Materials and Methods

The study was planned for research and presentation of dissertation as a part of the master's curriculum. It was planned, proposed to the selection committee of the department, and approved ethically by the committee. The present study was conducted according to randomized survey-based cross-sectional design. An online survey was conducted through structured parent rated scales in google forms format, that was distributed randomly across many social media platforms from the months of March 2021 to April 2021 (peak of the second wave of COVID outbreak in India); the only criteria being, that the children had to be within the age bracket of 6 - 12 years and the survey had to be completed only by the mothers of these children.

The Sleep Disturbance Scale in Children (SDSC), Strength and Difficulties Questionnaire (SDQ), and a self-rated scale for Sleep Schedule and Quality (SCQ) were used for the study. Sleep Disturbance Scale for Children consists of 26 Likert-type items, the SDSC was designed both to evaluate specific sleep disorders in children and allows the administrator to have a better understanding of the child's sleep-wake rhythm as well as problems in his/her sleep behavior. Population for Testing- The scale has been validated with youth populations aged 6 - 15 years. Administration- The questionnaire is completed by a parent or caregiver on behalf of the child using pencil and paper. Administration should require between 10- and 15-min. Strength and Difficulties Questionnaire, 25 items in the SDQ comprise 5 scales of 5 items each. Population for Testing- children aged 4 - 17 years. The purpose of the scale is to measure problems related emotional distress, conduct, hyperactivity-inattention, peer relationship and prosocial behaviors.

Mothers of the participant children have been approached, explained and consent of collecting data about their child was taken from them on e-forms through social networking platforms, on online survey basis. No screening tool or exclusion criteria were set for collecting data, as it was a randomly collected pool of samples. However, screening was done after the entire data collection process following

the above-mentioned inclusion and exclusion criteria. Among all the forms sent out randomly, 92 responses were received, from which 78 data (females = 41, males = 37) were retained for analysis and statistical calculations, using SPSS software (trial v26). Pearson’s correlation, regression and t-test were applied to the selected sample, to determine the impact and trend of the problem.

Results

Table showing the mean and SD for each of the sociodemographic variables. The average age has been computed to be 9 years.

	N	Mean (yrs)	Std. Deviation (yrs)
Child’s Age in yrs	78	8.91	1.88

Sociodemographic data.

Table 1a: showing the mean and SD for each of the sociodemographic variables. The average age has been computed to be 9 years.

1b: Pie chart representing the gender ratio of the sample group under study.

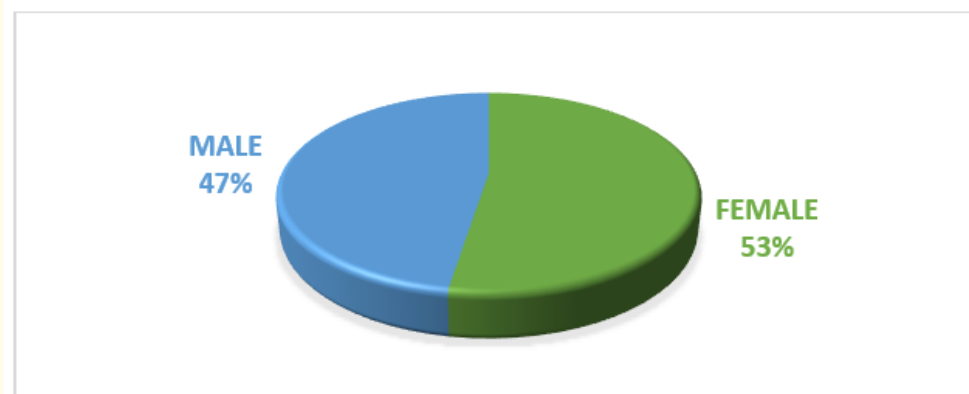


Figure 1: Pie chart representing the gender ratio of the sample group under study.

	N	Mean	Std. Deviation
SDSC	78	40.86	9.54
SDQ	78	11.53	5.31

Table 2: Descriptive Statistics showing mean and SD of the scales used.

The above table shows the mean and SD for scale used to measure the sleep disturbances and behavioral problems in children. As per the norms it can be seen that the prevalence of sleep disturbance of the sample group has been found to be a little more than average.

As per the norms it can be suggested that prevalence of behavioral problems in children (0-13 = normal level). It can be regarded as an expected finding since the study has been conducted on the general population with a randomly selected sample.

	Sleep disturbance score (SDSC)	Total difficulty score (SDQ)
Sleep Quality and Schedule (SCQ) Before	-0.284*	
Sleep Quality and Schedule (SCQ) After	-0.367**	-0.336**

Table 3: Table showing the correlation between Sleep Quality & Schedule (SCQ) with sleep disturbance and total difficulty score for emotional and behavioral disturbance.

There exists a significant -ve correlation between Sleep Quality and Schedule (SCQ) and

- Sleep disturbance (r = 0.36; p > 0.01)
- Behavioral problems (r = 0.33; p > 0.01)

A negative relation between the variables indicate that the variables are inversely proportional to each other. This suggests that the greater the presence of difficulties (In terms of emotional and behavioral problems), the poorer will sleep quality and schedule likely to be.

	Total difficulty score	EPS	CPS	HS	PPS	PSS
Total SDSC	.552**	.418**	.511**	.312**	.424**	-.239*

Table 4: Table showing the correlation between sleep disturbance scores with scores of behavioral distresses along with the correlation between sleep disturbance in children with emotional and behavioral problems in children.

There exists a significant +ve correlation between Sleep disturbances and children’s behavioral problems (r = 0.55; p > 0.01).

There exists a significant +ve correlation between subscales of SDQ and Sleep disturbances in children

- Emotional problem (r = 0.41; p > 0.01)
- Conduct problem (r = 0.51; p > 0.01).
- Hyperactivity (r = 0.31; p > 0.01)
- Peer problems (r = 0.42; p > 0.01)
- Prosocial scale shows a -ve correlation (r = 0.23; p > 0.05).

A positive relation between the variables indicate that both the variables are directly proportional to each other, which further suggests that if there is an increase in one of the variables, there is an increase in the other variable by default and vice versa. A negative relation between sleep disturbance with the score of prosocial scale indicate that the variables are inversely proportional to each other, i.e., the greater the presence of disturbances in sleep, more the prosocial behavior of the child would likely be decreasing.

	Total difficulty score	Emotional problems score (EPS)	Conduct problems (CPS)	Hyperactivity Score (HS)	Peer problems score (PPS)	Prosocial score (PSS)	Impact score
Norm	7.1	1.6	1.3	2.8	1.4	8.6	0.4
Results	11.5	2.27	2.27	4.27	2.33	7.88	0.7

Table 5: Comparative chart showing the mean of acquired results against norms of strengths and difficulties questionnaire (SDQ) for behavioral disturbances in the children during lockdown.

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.552 ^a	.305	.296	4.458
Predictors: (Constant), total sleep disturbance			
Dependent Variable: total behavioral difficulty score			

Table 6: a. Table showing the linear regression between sleep disturbances and emotional and behavioral disturbances.

Coefficients ^a					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.049	2.235		-.470	.640
Sleep disturbance score	.308	.053	.552	5.777	<.001

a. Dependent Variable: total behavioral difficulty score

Table 6b

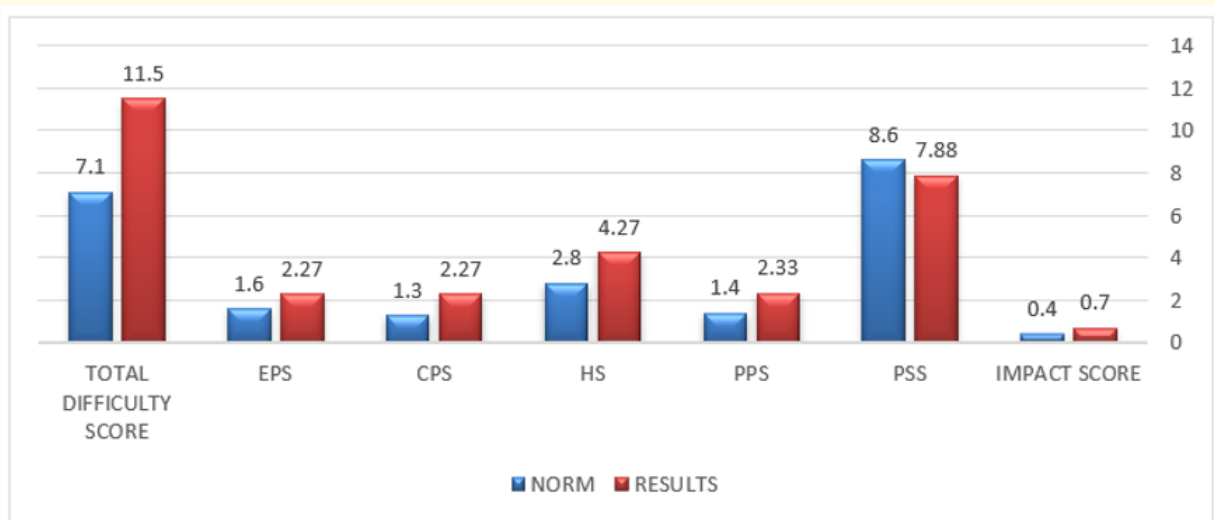


Figure 2

Adjusted R = .296 (29.6%) (Rounded to 30%)

i.e., 1 unit of sleep disturbance = 0.296 units of behavioral disturbance.

Unstandardized β coefficient = .308 (30.8%) (Rounded to 31%)

i.e., 1 unit of change in sleep = 0.308 units of emotional and behavioral disturbances.

Discussion

Sleep is fundamental for optimal health, as it plays a pivotal role in the onset and exacerbation of most chronic illnesses (von Ruesten., *et al.* 2012) [6]. The sample chosen for this purpose included 78 school-age children within the age range of 6 - 12 years with their mothers as the respondents. The workable sample was selected from the total samples collected, using purposive sampling technique following the structured inclusion exclusion criteria. The average age of the selected sample was found to be 9 years ($M = 8.91$) (see table 1). The average age of the respondents (mothers) was found to be 38 years with an average educational qualification of graduation degree with 81.4% of the samples with a nuclear family background.

Correlation coefficient computed to determine the association between sleep quality and schedule (SCQ) and sleep disturbances in the children show a negative correlation between the sleep quality and schedule that was maintained by the children before the lockdown condition with their sleep disturbances. As for during the lockdown period, there is a negative co-relation too (see table 3). A negative correlation between the sleep quality and schedule and behavioral patterns of the children during the lockdown condition has also been found (see table 3) indicating that significant changes in the sleep quality and schedule has had possible impacts in the increase of sleep disturbances and vice versa. Studies too demonstrates that confinement due to COVID-19 has caused interference in somnolence quality [7], and delay in sleep/wake schedule of children in all age groups as well as an increase of sleep disturbances [8]. A potential cause to such a response could be because due to the lockdown, with schools shut, playgrounds and other outdoor recreational activities of children being restricted, children stayed indoors with fewer physical activities and more relaxation, leading to an altered physical routine that showed its effect directly on their sleep course, both in terms of timing and quality. After administering the sleep disturbances scale (SDSC) on children, the acquired data shows that during the lockdown, children have had some persistent sleep disturbances that were not present before which are probable indicators of some kind of sleep disorder. To attest to this finding, there are studies that too have shown an increase in sleep disorders relating to problems with falling asleep, maintaining sleep, and the presence of nightmares and/or sleep terrors [9].

Regarding the association between sleep disturbances in children during the lockdown period and its effects on their emotional and behavioral patterns, the obtained data shows that there is significantly high positive relationship between sleep disturbance and in emotional and behavioral difficulties in children of school age during the lockdown period, which explains that there is an association between emotional and behavioral difficulties in the children and their sleep. In context to this finding, it can be understood that it is vital for children to engage themselves in social interaction with others of their age not only for their social development but also for a holistic biopsychosocial health. The mandatory lockdown condition put the children in a position of deprivation from a playful and healthy exposure to their schools and peers. This in turn affected their coping mechanisms towards the challenge thrown at them leading in growth of emotional and behavioral disturbances in them (see table 4). With respect to the findings obtained on the administration of strengths and difficulties questionnaire (SDQ), it is evident how a deviation has occurred in each of the domains, in the population, when compared to the norms (see table 5). As the results suggests, children due to the lockdown situation have faced problems with their emotion regulation which has further manifested in most children through conduct issues and hyperactivity; all of which are higher than the standard norm and are directly proportional with the disturbances in sleep, as results suggest. Here, we also find that children have faced irregularities and disturbances in the domains of their peer relationships, as well in prosocial skills as the obtained result as well shows as compared

to the standard norms. This particular finding suggests that the result of the confinement imposed on the children has deprived them of socializing, in terms of playing together, interacting, studying and sharing with others of their age, which is an essential part of development for children of school-age. As a result, there is also a noticeable diffraction in the domain of prosocial skills of children which can be evident with the fall in the mean of PSS against the standard norm and being inversely proportional with the disturbances in sleep health of the sample group. Available literature also attests that the imposed confinement has led to compromise the ability of emotional and behavioral regulation which induced and aggravated potential sleep difficulties [10].

A simple linear regression was computed to understand the degree of relationship between the variables under study, results of which suggests that, when determining the effect of sleep disturbance on the emotional and behavioral aspect of the children, about 30% of variability in emotional and behavioral problem is accounted for by the presence of sleep disturbance in children (see table 6 a, b), which predicts that during this pandemic lockdown, the presence of emotional or behavioral problems has highly affected the sleep patterns of the children. Research evidences have also explained that sleep disorders are evident in pediatric population which are linked to behavioral and emotional problems both in children and adolescents [1,11,12].

The profile overall thereby suggests, that whilst the children were home confined during the lockdown, the confined environment disabled the children to freely access their resources to learn, socialize with other children and channelize their energies through play, due to which, a major shift was caused in their overall lifestyle which later manifested itself in form of emotional and behavioral problems which in turn lead to causing disruptions in the schedule and quality of sleep (SCQ) leaving the children with disturbed sleep health as a whole; and the effects were vice-versa.

Conclusion

The sample of middle school age children in the present study showed significant sleep disturbance during the second wave of COVID outbreak in India. It can be thereby concluded that, there has been a prominent shift in the overall sleep health in the children of 6 - 12 years including a major change in sleep quality and schedule of the children on comparison of pre and post lockdown conditions. Significant emotional and behavioral problems were also evident, associated both with sleep disturbance and sleep schedule change in children.

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Conflict of Interest

No conflicts of interest were declared.

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