

**ORIGINAL RESEARCH****Evaluation of prevalence of sleep disorders among children aged 4 -10 years using Children's Sleep Habit Questionnaire (CSHQ)****<sup>1</sup>Dr Sudeep Awadhiya, <sup>2</sup>Dr Rashmi Dwivedi**<sup>1</sup>PG student, <sup>2</sup>Professor & Head, Department of Paediatrics, L.N Medical College and Research Centre, Bhopal, Madhya Pradesh, India**Correspondence:**

Dr Sudeep Awadhiya

PG student, Department of Paediatrics, L.N Medical College and Research Centre, Bhopal, Madhya Pradesh, India

**Abstract**

**Introduction:** Sleep problems are common among children. Difficulty initiating and maintaining sleep is one of the most frequent sleep problems in childhood but most parents' have negligence attitude towards sleep disturbances in children of aged 4-10 years. Therefore, the present study is undertaken to evaluate the prevalence of sleep disorders among children aged 4 -10 years.

**Material and Methods:** The present study was conducted among 200 children aged (4-10 years) visiting paediatric OPD and data was collected using an in-person structured pre-designed, pre-tested questionnaire and checklist and directly observing practices followed i.e., validated CSHQs questionnaire was used to assess knowledge, attitudes, and practices of parents towards sleep disturbances in children of age 4-10 years. Chi-square test (Fisher exact test) was applied with p-value of 0.05 were considered as significant.

**Results:** Out of total 200 children 102 (51%) children were having sleep disorder. Out of 26 rural 16 children (62 %) from rural area were found to have sleep disorder. Out of 174 urban children 86 (49 %) were having sleep disorder. Urban children were more affected compared to rural. Insomnia was seen in 13% of total children under study. Excessive day time sleepiness & insomnia were both present in 31 %.

**Conclusion:** Sleep deprivation was diagnosed when the cumulative daily hours of sleep was less than the mean daily amount needed. Early identification of sleep disorder at 2-6-year age children can be helpful for early intervention & better results. Parents do not perceive sleep disorder as a problem so are not aware about sleep hygiene. Knowledge improvement session for sleep disorder, sleep hygiene is necessary.

**Keywords:** Insomnia, Pediatric, Sleep, Snoring

**Introduction**

Sleep problems are common among children.<sup>1</sup> Between 15%–30% of children experience difficulties with falling and/or staying asleep.<sup>2</sup> This high rate of sleep problems is concerning, as healthy sleep is central to a range of regulatory mechanisms in the human body, and has implications for cognitive, psychological and physical wellbeing.<sup>1</sup>

As per Indian Academy of Pediatrics Sleep is a physiological state of unconsciousness from which a person can be aroused fully, compared to coma where arousal is either not there or is partial. Sleep is now considered to be an active process by the inhibition of the arousal system.<sup>3</sup> Difficulty initiating and maintaining sleep is one of the most frequent sleep

problems in childhood.<sup>4</sup> However, most parents' have negligence attitude towards sleep disturbances in children. Therefore, the present study is undertaken to evaluate the prevalence of sleep disorders among children aged 4 -10 years using Children's Sleep Habit Questionnaire (CSHQ)

### Material and Methods

The present hospital based cross sectional (observational) study was conducted among 200 children aged (4-10 years) visiting paediatric OPD in the department of pediatrics, Laxmi Narayan Medical College, Kolar Road, Bhopal (Madhya Pradesh) from February 2021 to January 2022. All parents were enrolled in the study after they gave consent and proper responses, then data was collected using an in-person structured predesigned, pretested questionnaire and checklist and directly observing practices followed.

Inclusion criteria comprised of all children aged (4-10 years) visiting paediatric OPD. Exclusion criteria comprised of children with chronic illness or long-term medication, those who do not give consent for the study, children with developmental delay and if parents (father/mother) are not available for history taking. Data was collected using a pre-designed, pretested, pre-validated checklist and questionnaire, coding was done.

Validated CSHQs questionnaire used and on-site observation done to assess knowledge, attitudes, and practices of parents towards sleep disturbances in children of age 4-10 years.<sup>5</sup> Comprehensive sampling frame constructed by interview of parents of children who come in inclusion criteria of study by taking history about sleep habit as per questionnaire. Interview of parents who gave consent was taken. Before the interview information was given to parents about the objective of the study. The questionnaire was in both English / Hindi language. Data analysis was done based on scoring system given in children's sleep habits questionnaire (CSHQ)<sup>5</sup> and data was analyzed with a total score and eight subscale scores, reflecting key sleep domains that encompass the major medical and behavioral sleep disorders in this age group. Items 1, 2, 3, 10, 11, 26 are scored in reverse. A total score was obtained by summing up the scores of the 33 items, and 8 subscale's scores were obtained by summing up their respective items. Higher scores indicate more sleep problems. The cut off in the original version is 41. After the collection and compilation of information, relevant test was applied. Statistical analysis was done using SPSS version-20. Chi-square test (Fisher exact test) was applied with p-value of 0.05 were considered as significant.

### Results

Out of total 200 children 102 (51%) children were having sleep disorder.

**Table 1: Correlation of rural residence with presence of sleep disorder**

RESIDENCE	SLEEP DISORDER		TOTAL
	PRESENT	ABSENT	
RURAL	16	10	26
PERCENTAGE	62%	38%	

Out of 26 rural 16 children (62 %) from rural area were found to have sleep disorder. In 10 rural children sleep disorder were absent (table 1).

**Table 2: Correlation of urban residence with presence of sleep disorder**

RESIDENCE	SLEEP DISORDER		TOTAL
	PRESENT	ABSENT	
URBAN	86	88	174
PERCENTAGE	49%	51%	

Out of 174 urban children 86 (49 %) were having sleep disorder. 88 urban children were not having sleep related problems (table 2).

**Table 3: Correlation of Rural & Urban Residence with presence of sleep disorder**

	SLEEP DISORDER		p-value
	PRESENT	TOTAL	
RURAL	16	200	Fisher exact test applied <b>p-value =0.025</b> SIGNIFICANT
URBAN	86	200	

Urban children were more affected compared to rural (table 3). On applying fisher exact test the result was found statistically significant (P-value <0.05).

**Table 4: Correlation of Age with Presence of Sleep disorder**

Age group (year)	Sleep disorder		Total	p-value
	Absent	Present		
6.5 And less	59(47.5%)	65(52.4%)	124(62%)	Fisher exact test applied p-value = 0.572 NS
More Than 6.5	39(51.3%)	37(48.6%)	76(38%)	
Total	98(49.0%)	102(51.0%)	200(100.0%)	

The children were grouped in two based on age 6.5 year and less and more than 6.5 year.

Comparing them p value is 0.572 which is not significant. 65 (52.4%) children with age 6.5 year and less and 37 (48.6%) with age more than 6.5 year were having sleep problems (table 4).

Age 6.5 year and less were associated with more day time nap compared to >6.5-year age children.

**Table 5: Correlation of Gender with presence of sleep disorder**

Gender	Sleep Disorder		Total
	Absent	Present	
Female	42(21%)	50(25%)	92(46.0%)
Male	56(28%)	52(26%)	108(54.0%)
<b>Total</b>	98(49%)	102(51.0%)	200(100.0%)

Out of 200 children under study 92 were Female 108 were Male. 50 (25%) Female and 52 (26 %) Male are having sleep disorder. On applying chi-square test the difference was not found statistically significant (table 5).

**Table 6: Prevalence of Insomnia in children**

Insomnia	Number	Percentage
Present	26	13.0%
Absent	174	87.0%
<b>Total</b>	200	100.0%

Insomnia was diagnosed in those children who answered positively to the questions pertaining to difficulty in initiation and maintenance of sleep. Insomnia was seen in 13% of total children under study (table 6).

**Table 7: Excessive Day time sleepiness & Insomnia in children wise distribution**

<b>EXCESSIVE DAYTIME SLEEPINESS &amp; INSOMNIA</b>	31%
<b>EXCESSIVE DAYTIME SLEEPINESS</b>	24%
<b>INSOMNIA</b>	13%

Excessive day time sleepiness & insomnia were both present in 31 % (table 7).

## Discussion

In our study we applied Children's Sleep Habits Questionnaire<sup>6</sup> which is a pre-tested and pre validated questionnaire after taking consent from parents. As this is valid in age group 4-10 year so we have included children in the selected age group in our study. After informing parents study was done in children, then scoring is done and cut off of 41 is considered to label sleep disorder.

Out of 200 children, 108 (54%) were male and 92 (46%) were female. Out of 102 children with sleep disorder 52 (51%) were male and 50 (49%) were female. A total 102 children with sleep disorder, 86 (84.3 %) were from urban and 16 (15.7%) were from rural area. Overall, 200 children surveyed & 102 (51%) were having sleep disorder. 65/124 (52.4%) Children with age 6.5 year and less were having sleep disorder. 37/76 (48.6%) children with age more than 6.5 year were having sleep disorder.

Similarly, Stein MA et al<sup>7</sup> done research on Sleep and behavior problems in school-aged children & parental perception of sleep disorder. Sleep problems were reported in 10.8% of the children with sleep disorder during the past 6 months, less than one half of the parents (<50%) who identified sleep problems reported that they had discussed sleep with their child's pediatrician. This was done at a developed country Michigan, Washington. India being developing country in our study we found poor parental perception of sleep problems due to low literacy rate & awareness about sleep problem as none of the parents reported in OPD for sleep related problems.

Study by Bharti B et al<sup>8</sup> at PGI, Chandigarh observed day time sleepiness in 28.2% children out of 103. In our study 24% of the children were suffer from day time sleepiness out of 102. They studied patterns and problems of sleep-in school going children and found percentage of children who took regular daytime nap was 28.2%. Co- sleeping, a traditional cultural practice in India was found in 93% of the children. Many results were consistent with this study. Parasomnias were more prevalent in children included in our study. Difference in methodology was a reason because in above mentioned study self-designed questionnaire was given to parents but in our study face to face interview of parents taken after explaining the questionnaire (CSHQs) to them in their vernacular language to get correct response.

Suri JC et al<sup>9</sup> studied epidemiology of sleep disorders in school children of Delhi found 47.5% of the children were observed to suffer from some form of sleep disorder. Another study<sup>10</sup> performed a clinical study on sleep pattern and sleep problems in school going children. The mean duration of sleep in this study group is 9.085 hours. Only 6% of the study group showed severe reduction of sleep duration. 69.76% of the study group having mild to moderate sleep deprivation. 72.8% of males among study group showed sleep deprivation where as 70.73% of females among study group showed sleep deprivation. The result was almost consistent with our study as both sexes were approximately equally affected with sleep disorders in our study too. 50/102 (25%) female & 52/102 (26%) male children were affected. So, we conclude gender is not a risk factor for sleep disorder.

Study by Marre S et al<sup>11</sup> found that young age children were having more daytime sleepiness, nocturnal wakefulness, sleep duration and resistance to sleep as we found in our study 65/102 children with younger age (<= 6.5 year) were compared to 37/102 affected children with > 6.5 year. Early intervention at 2-6 year age will give good future results.

## Conclusion

Sleep deprivation was diagnosed when the cumulative daily hours of sleep was less than the

mean daily amount needed. The average daily amount of sleep a child needs to avoid sleep debt is usually more than eight hours. Early identification of sleep disorder at 2–6-year age children can be helpful for early intervention & better results. Parents do not perceive sleep disorder as a problem so are not aware about sleep hygiene. Knowledge improvement session for sleep disorder, sleep hygiene is necessary. Information should include that sleep disorder affects the children's physical and academic performance.

## References

1. Bayes DM, Bullock B. Sleep problems in school aged children: a common process across internalising and externalising behaviours?. *Clocks & Sleep*. 2019 Dec 20;2(1):7-18.
2. Calhoun SL, Fernandez-Mendoza J, Vgontzas AN, Liao D, Bixler EO. Prevalence of insomnia symptoms in a general population sample of young children and preadolescents: gender effects. *Sleep medicine*. 2014 Jan 1;15(1):91-5.
3. Sukumaran TU. Pediatric sleep project. *Indian pediatrics*. 2011 Nov;48(11):843-4.
4. Fricke-Oerkemann L, Plück J, Schredl M, Heinz K, Mitschke A, Wiater A, Lehmkuhl G. Prevalence and course of sleep problems in childhood. *Sleep*. 2007 Oct 1;30(10):1371-7.
5. Murugesan G, Karthigeyan L, Selvagandhi PK, Gopichandran V. Sleep patterns, hygiene and daytime sleepiness among adolescent school-goers in three districts of Tamil Nadu: A descriptive study. *The National medical journal of India*. 2018 Jul 1;31(4):196-200.
6. Owens JA, Spirito A, McGuinn M. The Children's Sleep Habits Questionnaire (CSHQ): psychometric properties of a survey instrument for school-aged children. *Sleep-New York-*. 2000 Dec 15;23(8):1043-52.
7. Stein MA, Mendelsohn J, Obermeyer WH, Amromin J, Benca R. Sleep and behavior problems in school-aged children. *Pediatrics*. 2001 Apr;107(4):E60.
8. Bharti B, Malhi P, Kashyap S. Patterns and problems of sleep in school going children. *Indian Pediatrics*. 2006 Jan 1;43(1):35.
9. Suri JC, Sen MK, Adhikari T. Epidemiology of sleep disorders in the adult population of Delhi: A questionnaire based study. *Indian Journal of Sleep Medicine (IJSM)*. 2008;3(4).
10. Barathy C, Prabha S, Shanthi A. Study of sleep pattern in children aged 1-12 years attending OPD at tertiary care hospital, Puducherry, India. *Int J Contemp Pediatr*. 2017 Oct 24;4(6):1980.
11. Maree S, Zidi EM, Yari S, Javadi M. Prevalence of sleep problems and its relation to sleeping habits in toddlers. *Asian Pacific Journal of Environment and Cancer*. 2019 Jun 2;2(1):29-34.