

## STUDY ON SLEEP HABITS OF CHILDREN AGED 5 To 12 YEARS - A CROSS-SECTIONAL STUDY

J.A.M.Syed Ibrahim Sha<sup>1</sup>, G.Vivek<sup>2</sup>, M. Sarmila<sup>3</sup>

Received : 16/04/2025  
 Received in revised form : 03/06/2025  
 Accepted : 24/06/2025

## Keywords:

Sleep habits, Sleep disturbance,  
 School-aged children, Children's Sleep  
 Habits Questionnaire (CSHQ),  
 Daytime sleepiness, Parasomnias.

## Corresponding Author:

Dr. M. Sarmila,  
 Email: rajsharmismiles@gmail.com

DOI: 10.47009/jamp.2025.7.3.201

Source of Support: Nil,  
 Conflict of Interest: None declared

Int J Acad Med Pharm  
 2025; 7 (3); 1042-1046



<sup>1</sup>Senior Assistant Professor, Department of Paediatrics, Tirunelveli Government Medical College, Tamilnadu, India.

<sup>2</sup>Senior Assistant Professor, Department of Paediatrics, Tirunelveli Government Medical College, Tamilnadu, India.

<sup>3</sup>Junior resident, Department of Paediatrics, Dindigul Government Medical College, Tamilnadu, India.

## ABSTRACT

**Background:** Sleep is essential for the physical, cognitive, and emotional development of children. However, sleep disturbances in school-aged children are underreported in India, particularly in rural areas. **Aim:** To assess sleep habits and the prevalence of sleep disturbances among children aged 5–12 years attending the paediatrics department at Tirunelveli Medical College Hospital. **Material and Methods:** A cross-sectional study was conducted over 18 months among 200 children using the Children's Sleep Habit Questionnaire (CSHQ). Sociodemographic details, sleep schedule, and sleep subscale scores were collected. A Sleep Disturbance Index (SDI) >48 indicated disturbed sleep. **Result:** The mean age was  $8.59 \pm 2.3$  years; 57% were male, 55.5% resided in rural areas, and 72.5% belonged to nuclear families. The average weekday wake-up time was  $8:00 \pm 1.4$  am and bedtime  $9:00 \pm 1.3$  pm, while on weekends, wake-up was delayed to  $9:00 \pm 2.0$  am and bedtime to  $12:00 \pm 1.1$  am. The mean sleep duration was  $9 \pm 2$  h. Daytime sleepiness ( $11.2 \pm 2.3$ ) and parasomnias ( $10.6 \pm 2.5$ ) had the highest mean subscale scores, followed by bedtime resistance ( $7 \pm 0.8$ ) and sleep anxiety ( $5.8 \pm 1.5$ ). Sleep onset delay scored the lowest ( $1.5 \pm 0.5$ ). Based on the SDI, 61% ( $n = 122$ ) of the children were classified as having disturbed sleep. **Conclusion:** Despite an average sleep duration of nine hours, over 60% of children exhibited disturbed sleep, particularly marked by excessive daytime sleepiness and parasomnia. Early screening and intervention strategies are warranted to improve paediatric sleep health.

## INTRODUCTION

Sleep is a highly intricate physiological process that involves more than just closing one's eyelids and counting sheep. Unconsciousness occurs when the brain is relatively at rest but continues to respond to internal stimuli, resulting in a dynamic and active neurological state.<sup>[1]</sup> Inadequate sleep among children and adolescents has consistently been acknowledged as a significant public health concern. Over the past decade, researchers, healthcare practitioners, families, caregivers, and school personnel have increasingly recognized the importance of healthy sleep patterns and the implications of sleep disturbances.<sup>[2,3,4]</sup> Research indicates that approximately 20% to 40% of infants and school-aged children experience sleep problems, including difficulty initiating sleep, night awakenings, and resistance to sleeping alone.<sup>[3,5]</sup> Children aged 5–12 years represent a critical developmental phase marked by increased academic

demands, social interaction, and emotional growth. Adequate sleep is essential during this period to support learning, memory consolidation, behaviour regulation, and overall well-being.<sup>[2,6]</sup> This age group begins to establish routines and lifestyle habits that may persist into adolescence and adulthood. Healthy sleep patterns help strengthen attention span, emotional regulation, decision-making skills and physical growth. Furthermore, a significant proportion of high school students, specifically up to 75%, fail to meet the necessary eight hours of sleep per night and experience compromised sleep quality.<sup>[7]</sup>

Optimal sleep patterns and the synchronisation of circadian rhythms are crucial for proper physical, cognitive, and psychosocial growth in children and adolescents.<sup>[8]</sup> Disruptions in sleep during this sensitive period can negatively influence mental health, academic performance, and social relationships. Inadequate nocturnal sleep and excessive daytime drowsiness have been linked to

subpar scholastic achievement.<sup>[2,3]</sup> Chronic sleep issues in children are indicative of future clinical psychosocial symptoms in adolescents, including aggression, attention impairments, social anxiety, and depression.<sup>[2,4]</sup> These effects may persist and intensify if not identified and addressed early on. In addition, inadequate sleep and low sleep quality have been associated with cardiometabolic risk factors, such as obesity, which in turn raise the likelihood of developing cardiometabolic diseases and experiencing premature death in the future.<sup>[9]</sup>

Sleep disturbances have detrimental effects on cognitive processes, academic achievement, and emotional and behavioural control and are linked to obesity, among various other issues. In contrast, decreased physical activity and sports, as well as increased screen time and usage of electronic media (such as mobile devices, television, video games, and the Internet), have been linked to sleep disturbances in children.<sup>[10]</sup> However, there is limited literature describing school-aged children's sleep habits in India, particularly in Southern Tamil Nadu. This study aimed to fill this gap by describing the sleep habits of children aged 5–12 years attending the Paediatric Department at Tirunelveli Medical College Hospital.

## MATERIALS AND METHODS

This cross-sectional study was conducted on 200 children aged 5–12 years at the Department of Paediatrics, Tirunelveli Government Medical College, over 18 months. The study was presented to the Institutional Human Ethics Committee, and permission was obtained. The informed consent was obtained from their parents or guardians.

### Inclusion and exclusion criteria

All children aged 1–6 years attending the outpatient department of paediatrics were included, while those with chronic systemic disorders were excluded from the study.

## Methods

Census sampling was employed, and the total sample size was 200. A semi-structured questionnaire was used to collect data. The Children's Sleep Habits Questionnaire is a 33-item parent-reported instrument that assesses sleep habits and disorders in school-aged children over the past week or a typical recent week. Items were rated on a three-point scale: usually (5–7 times/week), sometimes (2–4 times/week), and rarely (0–1 time/week), with some items reverse-scored. The final two items used the response options: not sleepy, very sleepy, and falling asleep.

The items were grouped into eight subscales: bedtime resistance (six items), sleep onset delay (one item), sleep duration (three items), sleep anxiety (four items), night waking (three items), parasomnias (seven items), sleep-disordered breathing (three items), and daytime sleepiness (eight items). The Sleep Disturbance Index (SDI) corresponds to the sum of the subscale scores, and a higher score corresponds to more disturbed sleep.

Based on previous studies of Portuguese children, the cut-off was at least 48.<sup>[11]</sup> There were additional non-scorable questions about the child's wake time and bedtime on weekdays and weekends, total time of daily sleep, and whether the parents considered the child to have a sleep or falling asleep problem. Continuous variables are reported as means and standard deviations, and categorical variables as frequencies and percentages.

## RESULTS

The study population had a mean age of  $8.59 \pm 2.3$  years. In terms of gender distribution, male children constituted a higher proportion at 57% ( $n = 114$ ), compared to females at 43% ( $n = 86$ ). Regarding birth order, second-born children were more prevalent, accounting for 53.5% ( $n = 107$ ), whereas first-borns comprised 46.5% ( $n = 93$ ). More children resided in rural areas (55.5%,  $n = 111$ ) than in urban areas (44.5%,  $n = 89$ ) (Table 1).

**Table 1: Demographic characteristics**

		Frequency (N,%)
Age (Mean $\pm$ SD)		8.59 $\pm$ 2.3
Gender	Male	114(57%)
	Female	86(43%)
Birth Order	1st born	93(46.5%)
	2nd born	107(53.5%)
Locality	Rural	111(55.5%)
	Urban	89(44.5%)

The educational status of mothers revealed that a majority (69%,  $n = 138$ ) had attained at least primary school education, while 31% ( $n = 62$ ) had education below the primary level. In terms of occupation, 54% of mothers ( $n = 108$ ) were working compared to 46% ( $n = 92$ ) who were housewives. Among fathers, 75.5% ( $n = 151$ ) had an education level of primary

school or above, whereas 24.5% ( $n = 49$ ) had less than primary school education.

A large majority of fathers were employed (96%,  $n = 192$ ), while only 4% ( $n = 8$ ) were unemployed. Regarding family structure, nuclear families predominated, accounting for 72.5% ( $n = 145$ ) compared to 27.5% ( $n = 55$ ) in joint families. The socioeconomic status distribution showed that the

lower middle class constituted the highest group (44%, n = 88), followed by the lower class (27.5%, n

= 55), upper middle class (17.5%, n = 35), and upper lower class (11%, n = 22) (Table 2).

**Table 2: Parental and household socio-demographic characteristics**

Characteristics	Frequency (N,%)
Mother's Education	< Primary School
	62(31%)
Mother's Occupation	≥ Primary School
	138(69%)
Father's Education	Housewife
	92(46%)
Father's Occupation	Working
	108(54%)
Type of Family	< Primary School
	49(24.50%)
Socioeconomic Status	≥ Primary School
	151(75.50%)
Type of Family	Not Working
	8(4%)
Type of Family	Working
	192(96%)
Type of Family	Joint
	55(27.50%)
Type of Family	Nuclear
	145(72.50%)
Type of Family	Lower
	55(27.50%)
Type of Family	Upper Lower
	22(11%)
Type of Family	Lower Middle
	88(44%)
Type of Family	Upper Middle
	35(17.50%)

The mean weekday wake-up time was 8:00 ± 1.4 am, while the weekend wake-up time was later at 9:00 ± 2.0 am, indicating a delayed wake-up pattern on

weekends. Similarly, the weekday bedtime averaged 9:00 ± 1.3 pm, whereas the weekend bedtime was significantly later at 12:00 ± 1.1 am (Table 3).

**Table 3: Sleep schedule: weekday vs. weekend timing**

Time (am)	Mean ± SD
Weekday Wake-up Time	8 ± 1.4
Weekend Wake-up Time	9 ± 2
Weekday Bedtime	9 ± 1.3
Weekend Bedtime	12 ± 1.1

Daytime sleepiness had the highest mean score at 11.2 ± 2.3, followed closely by parasomnias with a mean score of 10.6 ± 2.5. Bedtime resistance and sleep anxiety also showed relatively elevated means of 7 ± 0.8 and 5.8 ± 1.5, respectively. Sleep duration

and night waking had moderate scores, with means of 4 ± 0.9 and 4.4 ± 1.1, respectively. Sleep-disordered breathing had a similar mean value of 4.4 ± 1.13. The lowest mean score was observed for sleep onset delay, at 1.5 ± 0.5 (Table 4).

**Table 4: Sleep habit subscale scores among children**

Subscale	Mean±SD
Bedtime Resistance	7±0.8
Sleep Onset Delay	1.5±0.5
Sleep Duration	4±0.9
Sleep Anxiety	5.8±1.5
Night Waking's	4.4±1.1
Parasomnias	10.6±2.5
Sleep Disordered Breathing	4.4±1.13
Daytime Sleepiness	11.2±2.3

Based on the sleep disturbance index, 61% of the children (n = 122) had disturbed sleep (score >48), whereas only 39% (n = 78) were identified as having normal sleep (score <48). The overall sleep

assessment revealed a mean total sleep duration of 9 ± 2 h, and the mean sleep disturbance index was 49.2 ± 4 (Table 5).

**Table 5: Total sleep duration and sleep disturbance profile**

Sleep Disturbance Index	Frequency N(%)
Normal Sleep (<48)	78(39%)
Disturbed Sleep (>48)	122(61%)

## DISCUSSION

In our study, the mean age of the children was 8.59 years ± 2.3, with 57% males and 43% females; 55.5% resided in rural areas and 44.5% in urban areas. Maternal education was primary or above in 69% of the cases, and 54% of mothers were employed. Among fathers, 75.5% had at least a primary

education, and 96% were employed. Nuclear families constituted 72.5% of households, with most families belonging to the lower-middle (44%) and lower (27.5%) class segments. Similarly, these socio-demographic characteristics align with the findings of Afonso et al., who reported a predominantly male population (51%) but with a much higher urban representation (85.3%) and 14.7% rural.<sup>[10]</sup>

Similarly, Bharathy et al. found children with a mean age of  $6.25 \pm 3.2$  years and higher parental literacy (94.2% of mothers and 92.8% of fathers). Nuclear families comprised 66.2% of the sample, and 52.6% belonged to lower socioeconomic groups.<sup>[12]</sup> Demographic patterns suggest that parental education, employment, and family type may influence children's sleep behaviours.

In our study, the mean weekday wake-up time was  $8:00 \pm 1.4$  am, while the weekend wake-up time was later at  $9:00 \pm 2.0$  am, reflecting a delayed weekend pattern of sleep. Weekday bedtime averaged  $9:00 \pm 1.3$  pm, shifting significantly later to  $12:00 \pm 1.1$  am on weekends. Daytime sleepiness had the highest mean score ( $11.2 \pm 2.3$ ), followed by parasomnias ( $10.6 \pm 2.5$ ), bedtime resistance ( $7 \pm 0.8$ ), and sleep anxiety ( $5.8 \pm 1.5$ ). Moderate scores were observed for sleep duration ( $4 \pm 0.9$ ), night waking ( $4.4 \pm 1.1$ ), and sleep-disordered breathing ( $4.4 \pm 1.13$ ), with sleep onset delay scoring the lowest ( $1.5 \pm 0.5$ ). Based on the sleep disturbance index (mean  $49.2 \pm 4$ ), 61% ( $n = 122$ ) of the children had disturbed sleep (score  $> 48$ ), while 39% ( $n = 78$ ) had normal sleep, with an overall mean sleep duration of  $9 \pm 2$  hours.

Similarly, Gupta et al. noted that weekday sleep of 8.3 hours increased to 9.5 hours on weekends.<sup>13</sup> Murugesan et al. also reported that 65.1% of adolescents experienced daytime sleepiness in class, with 64% sleeping  $< 8$  hours and 5.6%  $< 6$  hours, while Desai and Borkar found a comparable mean for daytime sleepiness ( $13.04 \pm 5.44$ ,  $p < 0.0001$ ).<sup>[14,15]</sup> Frequent sleep deprivation and daytime sleepiness among adolescents indicate growing sleep challenges over time and also reported a mean parasomnia score of  $10.1 \pm 4.46$ . Similarly, Goodwin et al. noted that parasomnias, including sleep talking (OR = 2.38) and nightmares (OR = 2.25), were among the most common disturbances in children aged 6 to 11 years.<sup>[16]</sup>

Matsuoka et al. identified parasomnias, bedtime resistance (32.2%), and sleep anxiety (21.4%) among the top sleep problems in children, who observed high rates of bedtime resistance and anxiety, while Desai and Borkar, who reported even higher means for bedtime resistance ( $11.79 \pm 4.56$ ). In contrast, sleep onset delay showed the lowest mean score ( $1.5 \pm 0.5$ ), suggesting that initiating sleep was less problematic among our participants.<sup>[16,17]</sup>

Tharakan and Shenoy observed variability in sleep duration, with 48% of children experiencing disturbances, 33.36% going to bed at 9 PM, and 17.8% sleeping  $< 8$  hours.<sup>18</sup> Mathew et al. reported a shorter sleep duration of  $7.2 \pm 1.26$  hours and 60% with inadequate sleep, while Sambaras et al. linked shorter sleep ( $\leq 8$  hours) with higher behavioural difficulties.<sup>[19,20]</sup> Beena et al. reported a similar mean sleep duration ( $9:06$  hours  $\pm 42:18$  min), with 76.52% prevalence of sleep disorders.<sup>[21]</sup> Likewise, Afonso et al. found a mean duration of 9 h 37 min  $\pm 44$  min and 25.8% reporting disturbances, and Bharathy et al.

noted  $9.38 \pm 1.05$  hours of night sleep with 51.1% having sleep disorders.<sup>[10,12]</sup>

Our study highlights that parental education, employment status, and family type appear to influence children's sleep behaviour. Despite adequate average sleep duration, the high prevalence of disturbed sleep and daytime sleepiness underscores the importance of assessing sleep quality rather than merely quantity. Weekend delays in sleep and wake times, along with parasomnias and behavioural difficulties.

### Limitations

The cross-sectional design of this study limits causal interpretations between sleep disturbances and sociodemographic factors. The use of parent-reported CSHQ data may introduce recall bias and subjectivity into the study. The lack of objective sleep measures, such as actigraphy, reduces the precision of sleep assessment. As a single-centre study with unmeasured confounders (e.g. screen time, diet, and activity), the generalisability of our findings is limited.

## CONCLUSION

This study shows that most children aged approximately 8.5 years, predominantly from rural and nuclear families, experience significant sleep-related challenges despite averaging nine hours of sleep. Although weekday and weekend wake times were similar, bedtimes were notably delayed on weekends. Daytime sleepiness and parasomnias were the most prominent disturbances, followed by bedtime resistance, sleep anxiety, and night-waking. A substantial 61% of children had disturbed sleep, as indicated by the Sleep Disturbance Index. Our study highlights the need for the early identification and management of sleep issues in school-aged children.

## REFERENCES

1. Brinkman JE, Reddy V, Sharma S. Physiology of sleep. StatPearls, Treasure Island (FL): StatPearls Publishing; 2025. <https://www.ncbi.nlm.nih.gov/books/NBK482512/>
2. Liu J, Ji X, Pitt S, Wang G, Rovit E, Lipman T, et al. Childhood sleep: physical, cognitive, and behavioural consequences and implications. World J Pediatr 2024; 20:122–32. <https://doi.org/10.1007/s12519-022-00647-w>.
3. Becker SP, Gregory AM. Editorial Perspective: Perils and promise for child and adolescent sleep and associated psychopathology during the COVID-19 pandemic. J Child Psychol Psychiatry 2020; 61:757–9. <https://doi.org/10.1111/jcpp.13278>.
4. Ranum BM, Wichstrøm L, Pallesen S, Steinsbekk S. Prevalence and stability of insufficient sleep measured by actigraphy: a prospective community study. Pediatr Res 2020; 88:110–6. <https://doi.org/10.1038/s41390-020-0768-y>.
5. Williamson AA, Mindell JA, Hiscock H, Quach J. Child sleep behaviours and sleep problems from infancy to school-age. Sleep Med 2019; 63:5–8. <https://doi.org/10.1016/j.sleep.2019.05.003>.
6. Matthews KA, Pantescio EJM. Sleep characteristics and cardiovascular risk in children and adolescents: an enumerative review. Sleep Med 2016; 18:36–49. <https://doi.org/10.1016/j.sleep.2015.06.004>.

7. Sun W, Li SX, Jiang Y, Xu X, Spruyt K, Zhu Q, et al. A community-based study of sleep and cognitive development in infants and toddlers. *J Clin Sleep Med* 2018; 14:977–84. <https://doi.org/10.5664/jcsm.7164>.
8. Hagman E, Danielsson P, Brandt L, Ekblom A, Marcus C. Association between impaired fasting glycaemia in pediatric obesity and type 2 diabetes in young adulthood. *Nutr Diabetes* 2016;6: e227. <https://doi.org/10.1038/nutd.2016.34>.
9. DeBoer MD, Gurka MJ, Woo JG, Morrison JA. Severity of metabolic syndrome as a predictor of cardiovascular disease between childhood and adulthood: The Princeton Lipid Research Cohort Study. *J Am Coll Cardiol*. 2015; 66:755–757. <https://doi.org/10.1016/j.jacc.2015.05.061>
10. Afonso, A.; Jacinto, G.; Infante, P.; Engana, T. Primary School Children's Sleep Habits: Association with Socioeconomic Factors and Physical Activity Habits. *Children* 2022, 9, 965. <https://doi.org/10.3390/children9070965>
11. Parreira AF, Martins A, Ribeiro F, Silva FG. Clinical Validation of the Portuguese Version of the Children's Sleep Habits Questionnaire (CSHQ-PT) in Children with Sleep Disorders and ADHD. *Acta Med Port* 2019; 32:195–201. <https://doi.org/10.20344/amp.10906>.
12. Barathy C, Prabha S, Shanthi AK, Devikittu. Study of sleep pattern in children aged 1-12 years attending OPD at tertiary care hospital, Puducherry, India. *Int J Contemp Pediatr* 2017; 4:1980. <https://www.ijpediatrics.com/index.php/ijcp/article/view/1149>.
13. Gupta R, Kandpal SD, Goel D, Mittal N, Dhyani M, Mittal M. Sleep patterns, co-sleeping and parent's perception of sleep among school children: Comparison of domicile and gender. *Sleep Sci* 2016; 9:192–7. <https://doi.org/10.1016/j.slsci.2016.07.003>.
14. 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. *Natl Med J India* 2018; 31:196–200. <https://doi.org/10.4103/0970-258X.258216>.
15. Desai PY, Borkar P. Assessment of sleep quality in school children of 6-12 years in COVID-19 pandemic. *Int J Res Med Sci* 2021; 9:1648. <https://doi.org/10.18203/2320-6012.ijrms20212231>.
16. Goodwin JL, Kaemingk KL, Fregosi RF, Rosen GM, Morgan WJ, Smith T, et al. Parasomnias and sleep-disordered breathing in Caucasian and Hispanic children - the Tucson children's assessment of sleep apnea study. *BMC Med* 2004; 2:14. <https://doi.org/10.1186/1741-7015-2-14>.
17. Matsuoka M, Matsuishi T, Nagamitsu S, Iwasaki M, Iemura A, Obara H, et al. Sleep disturbance has the largest impact on children's behaviour and emotions. *Front Pediatr* 2022; 10:1034057. <https://doi.org/10.3389/fped.2022.1034057>.
18. Tharakan RM, Shenoy KV. A study on sleep patterns and sleep problems in children aged 6 to 15 years as perceived by their parents. *Int J Contemp Pediatr* 2019; 6:611. <https://doi.org/10.18203/2349-3291.ijcp20190697>.
19. Mathew G, Varghese AD, Benjamin AI. A comparative study assessing sleep duration and associated factors among adolescents studying in different types of schools in an urban area of Kerala, India. *Indian J Community Med* 2019;44: S10–3. [https://doi.org/10.4103/ijcm.IJCM\\_19\\_19](https://doi.org/10.4103/ijcm.IJCM_19_19).
20. Sambaras R, Lesinskiene S, Dervinyte-Bongarzoni A. Study of sleep duration and mental health characteristics of preschool children. *J Case Rep Med Hist* 2022;2(5). <https://www.acquirepublications.org/Journal/CaseReports/PDF/JCRMH2200123.pdf>
21. Beena N, Cherian CS, Abraham J. Sleep pattern and sleep disorders in school-going children aged 6-12 years and its association with screen time: a cross-sectional study from South Kerala during the COVID-19 pandemic. *Int J Contemp Pediatr* 2023; 10:823–8. <https://doi.org/10.18203/2349-3291.ijcp20231485>.