

## Sleep Problems in Preschool and School Aged Rural Indian Children

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We assessed 513 children (2-6 y = 252; 7-12 y = 261) who visited the pediatric outpatient of a rural medical college hospital, for sleep problems using 'BEARS' tool. Sleep problems detected in the BEARS domains for preschool (2-6 years,  $n=252$ ) and school children (7-12 years,  $n=261$ ) were as follows: bedtime problems (33.3% vs 14.9%,  $P<0.001$ ), excessive daytime sleepiness (32.5% vs 1.9%,  $P<0.001$ ), awakening during night (25% vs 11.87%,  $P<0.001$ ), regularity and duration of sleep (19.84% vs 4.98%,  $P<0.001$ ), and sleep disordered breathing (4.8% vs 5%,  $P=0.1$ ). We conclude that sleep problems are common among rural Indian children and should be routinely screened for during health visits.

**Key words:** Child, India, Rural, Sleep problems.

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Inadequate or poor sleep in children may have negative consequences on a host of functional domains, including mood, behavior, learning, and health. Therefore, it is important for pediatricians to both screen for and recognize sleep disorders in children during health encounters [1].

BEARS screening tool has been used to identify sleep problems among preschool and school-aged children [2,3]. A study that compared sleep in preschool and school-aged children using BEARS tool found that sleep problems and sleep patterns differed between these groups. The differences were attributed to school schedules, sleep practices and homework load in the groups [3].

Studies have been reported from urban India on sleep problems in school-children [4,5] and adolescents [6]. There is no sleep study reported from rural India. The purpose of our study was to investigate sleep problems of preschool and school-aged rural Indian children using BEARS screening tool.

### METHODS

This cross-sectional study was conducted from July to December 2009 in the Department of Pediatrics, KVG Medical College, Sullia, which serves the rural population of neighboring districts. The Research Ethics Board of KVG Medical College approved the study.

A convenience sample of 582 children (aged 2-12 years) presenting for general medical problems or well child visits during the study period was randomly recruited from the pediatric out-patient. None of the children presented primarily for a sleep problem. 69 children were excluded from the study. Reasons were – absence of the mother during the visit ( $n=50$ ); chronic illness ( $n=2$ ); severe asthma ( $n=2$ ); obesity ( $n=1$ ) and, neurological problems ( $n=2$ ). Besides, children who stayed in hostels ( $n=7$ ) and those on long-term medications ( $n=5$ ) were also excluded. The remaining 513 children were divided into two groups i.e., preschool (2-6 years) and school age (7-12 years) as BEARS questions were different

**TABLE I** DISTRIBUTION OF SLEEP PROBLEMS IN THE STUDY POPULATION ACROSS DIFFERENT DOMAINS OF BEARS QUESTIONNAIRE

Domain of BEARS questionnaire	Preschool children % (n=252)	School-aged children % (n=261)	P value (Chi-square test)
Bedtime problems	33.3%	14.9%	<0.001
Excessive daytime sleepiness	32.5%	1.9%	<0.001
Awakenings during the night	25%	11.9%	<0.001
Regularity and duration of sleep	19.8%	5%	<0.001
Sleep-disordered breathing	4.8%	5%	0.908

for the groups. After addressing the primary problem for which the child had come for consultation, and after obtaining consent, the included subjects were screened for sleep problems using the BEARS tool.

The BEARS instrument is divided into five major sleep domains, providing a comprehensive screen for the major sleep disorders affecting children 2-18 years old (B=Bedtime Issues, E=Excessive Daytime Sleepiness, A=Night Awakenings, R=Regularity and Duration of Sleep, S=Snoring). Each sleep domain has a set of age-appropriate “trigger questions” for use in the clinical interview [1]. The BEARS tool was translated to Kannada by the principal investigator who is well versed in both the languages and given to another expert for validation. Both the parent and the child were asked to reply positively if the problem occurred on most days in the past two weeks prior to onset of illness.

Additional information collected included age, sex, co-sleeping, and medical history. Co-sleeping was defined as sharing the bed with parents, grandparents or siblings on all days.

Data were entered into SPSS for windows, version 11.5 and descriptive statistics were calculated. Chi-square test was used to compare frequencies among the two groups and t test to compare the means, wherever applicable.

## RESULTS

513 children were screened for sleep problems. Of these, 252 were in preschool group (128 female, 50.8 %) and 261 were in school-age group (132 female, 50.5%). The mean age in preschool group was 49.6 ( $\pm 13.7$ ) months and in school-age group was 114.7 ( $\pm 20.1$ ) months.

Sleep problems were found in 51.1% of 513 children in the study population in at least one of the BEARS domains. **Table I** depicts the distribution of sleep problems across different domains of BEARS among preschool and school groups. Co-sleeping was significantly more common in preschool children than school-age children (96% vs 85.8%,  $P < 0.01$ ). School children woke up earlier [6:34 AM ( $\pm 0.66$ hrs) vs 6:49 AM ( $\pm 0.71$ hrs),  $P < 0.001$ ] and slept later than their preschool counterparts [9:21 PM ( $\pm 0.88$ hrs) vs 9:06 PM ( $\pm 0.99$ hrs),  $P = 0.003$ ]. The resultant night sleep duration of school-aged children was less than the preschool children [9.22 hrs ( $\pm 0.99$  hrs) vs 9.75hrs ( $\pm 1.04$  hrs),  $P < 0.001$ ].

## DISCUSSION

Fifty one percent of the 2-12 year old children had sleep problems in at least one of the BEARS domains. Sleep patterns and sleep problems of preschoolers as compared to school-aged children can be summarized as follows: (i) the sleep duration of preschoolers was greater, in agreement with the sleep requirements for age [1,7]; (ii) co-sleeping was more common among preschool children similar to that in studies finding greater prevalence with younger age [8]; (iii) they had more bedtime problems, irregularity in sleep-timings similar to Iranian preschoolers [3]; (iv) they had frequent awakenings at night; and (v) daytime napping was common, as expected for age [1,7].

The sleep problems in Indian children were more than the United States counterparts in most BEARS domains. Sleep disordered breathing was an exception, where Indian children had lesser problems [2]. Compared to a study from Iran based on the BEARS tool, sleep problems in our subjects

**WHAT THIS STUDY ADDS?**

- Sleep problems are common among rural Indian children. Sleep patterns and problems of preschool and school children differ significantly.

were lower in most domains [3]. The differences in the various studies could be due to differences in sleep practices, co-sleeping, sleep environment and different parental expectations of sleep.

The study has several limitations. It is a hospital based cross-sectional study and may not represent the sleep problems of all rural Indian children. It relied on self-report and socially desirable responses cannot be ruled out. The results would have been more informative if details of parental socio-economic status, literacy, number of siblings were collected. Since data was collected over 6 months, seasonal influence on sleep could have affected the results [9].

There is a methodological limitation in the study. BEARS questions for assessing sleep problems in pre-school and school-aged children were not exactly the same [1]. These discrepancies could have influenced differences observed between the two groups.

We conclude that sleep problems are common in rural children and should be routinely screened during health visits.

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