

## Sleep Habits among a Group of Iranian School-Aged Children

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### Abstract

**Background and Objective:** Sleep problems are common in school-aged children. However, despite the high prevalence, they often are overlooked. The aim of this study was to determine the frequency of sleep problems in elementary school students in Kashan, Iran.

**Materials and Methods:** This descriptive cross-sectional study was conducted on 300 elementary school students (7-12 years old) in Kashan City. The participants were recruited via random cluster sampling. The BEARS [B = Bed-time Issues, E = Excessive Daytime Sleepiness (EDS), A = Night Awakenings, R = Regularity and Duration of Sleep, S = Snoring] questionnaire was completed by mothers. Data analysis was carried out by descriptive statistics [mean and standard deviation (SD)], t-test, and Mann-Whitney U test.

**Results:** A total of 300 students participated in the study. Of them, 44.3% (133) were boys and 55.7% (167) were girls. The most common problem was nightmare (15.7%) and resistance against wakening (21.5%). The frequency of waking up at night in boys was higher than girls ( $P < 0.05$ ).

**Conclusion:** High frequency of sleep problems in the study indicates the importance of sleep problems in children. To promote the awareness of parents, it is necessary to give information about healthy sleep patterns through schools and parent-teacher meetings.

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**Keywords:** Habits; Sleep; School age; Child

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### Introduction

One third of life is spent in sleep, while it should not be considered as wasted time. A good sleep decreases stress and anxiety. It also improves attention, consistency, and pleasure in daily activities through energy recovery (1, 2). Individuals have unique sleep habits, which are one of the effective factors on sleep. Bad habits and sleep problems resulting from physical, psychological, and environmental conditions, as well as hereditary characteristics reduce the amount of desirable sleep, and endanger the one's health (3). Approximately 25% to 40% of adolescents commonly

encounter sleep problems, which often are unknown and incurable (4). Insufficient sleep or sleep deprivation causes neurological, behavioral, and psychological changes such as depression, anxiety, cognitive dysfunction, and learning disabilities (4, 5). It is associated with reduced daily performance and efficacy in the classroom in school-aged children (4). Following the natural development, it is expected to establish sleep patterns, and it will cause a decrease in undesirable behaviors, such as sleep parasomnia, as children reach school age (6). Although the number of sleep problems are normally self-limiting and transient during infancy and childhood, internal and external risk factors such as mood problems, chronic illness, and depression in mothers may predispose chronic sleep disorders in some chil-

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dren (7-10). If such behaviors continue to school age, follow-up and treatment would be necessary. A review study showed that in adolescence, not only sleep problems are unresolved, but also complications of insomnia habit gradually appear (11). Since sleep problems are prevalent in children, preschool and school- aged children should be remarkably considered. Despite the high prevalence, sleep problems are often ignored or over-reported in child healthcare (7). Even specialists often overlook children's sleep problems (12). Childhood is appropriate for training proper sleep habits (12). It is required to perform more research to develop detection and treatment strategies for sleep disorders to correctly diagnose hyperactivity or abnormal behaviors (12). This study aimed to investigate sleep problems among school-aged children in Kashan, Iran.

## Materials and Methods

**Design:** This was a cross-sectional study on school-aged children (7 to 12 years) in Kashan City. Sample was selected by random clustering. After taking permission, a list of governmental and nongovernmental schools was prepared. There were 87 schools in Kashan; 14 schools including 7 girl's schools and 7 boy's schools were randomly selected. In each school, 7 school students were randomly selected from each class. Then, in each school, seven students from each grade were randomly selected and evaluated according to eligibility criteria. The questionnaire was explained for the participants.

**Setting and participants:** Inclusion criteria were lack of remarkable stress in the previous year (due to the death of relatives and emigration), lack of major emotional and educational failures (according to the teacher's reports and student's health records), and lack of suffering from a disease that requires hospitalization or serious and long-term treatment, according to the parents' reports and student's health records. The first researcher communicated with the participants and explained the objective of the study. If the participants had any question they were answered completely.

**Data collection:** This study was performed during three months from October 2013 to February 2015. The study was approved by the Research Ethics Committee of Yazd University of Medical Sciences, Yazd, Iran. Informed consent was obtained from parents. It was expressed that participation in this study was voluntary. They

also were assured of confidentiality of information and were informed that they could withdraw from the study at any time.

We used BEARS [B = Bedtime Issues, E = Excessive Daytime Sleepiness (EDS), A = Night Awakenings, R = Regularity and Duration of Sleep, S = Snoring] questionnaire as well as demographic questionnaire to collect the data. This questionnaire, designed by Owens and Dalzell, includes 17 questions and 5 scales, comprising problems of sleep onset, EDS, waking during the night, regularity and duration of sleep, and snoring (13). The questionnaire was validated in Iran by Mohammadi et al., to use screening for sleep problems of children of 2 to 12 years. Cronbach's alpha of the questionnaire was 0.8, and test-retest showed acceptable reliability (14).

Overall, 470 questionnaires were distributed among the children's parents, of which 300 questionnaires were completed, 60 questionnaires were incomplete, and 110 questionnaires were not returned. The mothers filled the questionnaires. The parents were asked an initial screening question about the entire characteristics of child's sleep and possible problems in each domain such as bedtime problems, eliciting a yes or no response. If the answer was "yes", then the parents were asked to describe the problem in the second step.

According to the questionnaire, behaviors like resistance to going to bed, difficulty falling asleep, and frequent awakening during sleep with a frequency of 3 to 4 nights a week were considered as sleep disorders. However, abnormal behaviors such as nightmare, fear to sleep with a frequency of one night a week, and sleepwalking with a frequency of one night a month are known as disorders. Findings were reported by frequency of obtained score from the above scales (13).

**Data analysis:** Data was analyzed using descriptive indices (frequency, percent, and mean) and analytical tests (t test and Mann-Whitney) by SPSS software (version 16, SPSS Inc., Chicago, IL, USA).

## Results

In this study, 300 children were investigated. Of them, 55.3% were female (n = 167) (Table 1).

The most common sleep problems in children were hard awakening and nightmares, while they were higher in boys (Table 2).

Hours of sleep on school nights and the weekend nights were not significantly different. The

higher the grade, the later bedtime was found to be on both school days and weekend. There was significant difference between waking time on school days and days at weekend. There was relationship between increasing grade and earlier waking time on school days, but higher grades were associated with later waking time on weekends. The mean and standard deviation (SD) of waking time in school days and holidays were  $8.89 \pm 1.23$  and  $6.70 \pm 0.49$ , respectively. Moreover, we found a significant difference among age groups considering time of going to bed on school days ( $P = 0.006$ ), but not on holidays ( $P > 0.050$ ).

**Table 1.** Distribution of participants in terms of age and sex

Variable Age (year)	Frequency (percent)	Category	Total [n (%)]
7	59 (19.7)	Boy	22 (37.0)
		Girl	37 (63.0)
8	66 (22.0)	Boy	18 (27.3)
		Girl	48 (72.7)
9	66 (22.0)	Boy	22 (37.0)
		Girl	44 (63.0)
10	49 (16.3)	Boy	26 (53.0)
		Girl	23 (47.0)
11	26 (8.7)	Boy	12 (46.2)
		Girl	14 (53.8)
12	34 (11.3)	Boy	21 (61.8)
		Girl	13 (38.2)

Older students also reported more daytime sleepiness. The relative frequency of waking during the night and daytime sleepiness was higher in boys (10.6%) (Table 2).

## Discussion

This study was an evaluation of sleep problems in school-aged children of Kashan City. We also evaluated the occurrence of differences between two sexes which appears to be less attended to or to bear inconsistent results.

In present study, hard awakening was the most common sleep problem, reported in 21.5% of the children. This finding is consistent with Khazaie

et al. study which reported hard awakening in 44.4% of the participants (15).

Nightmare was the second prevalent sleep problem in the present study with a prevalence of 15.7% without significant difference between boys and girls. In a study performed by Kahn et al. in Germany, 28% of school-aged children experienced nightmares, which was higher in girls (16). Prevalence of nightmares in other studies has been reported from 7.2% to 15.0% (17, 18). These differences may be due to puberty, stress, and separation of children from their parents especially in girls at school age. In children who were more anxious, the rate was reported higher (19-21).

Panaghi et al., in their research on 692 school-aged children in Tehran, Iran, indicated that the most common sleep disorders in children was resistance to sleep (41.6%). According to their research, poor sleep habits, resistance to sleep, and parasomnia were the most common problems compared to other habits (22). In our evaluation, 8.1% of participants reported resistance to sleep.

In the present study, the results indicated that daytime sleepiness is more prevalent in boys and is the only sleep problem significantly different between the two genders; while bedtime did not differ between boys and girls in both schooldays and holidays. Waking time was also not significantly different. Some authors have reported different results, as Van Litsenburg et al., who stated sleep problems such as delayed sleep and daytime sleepiness as more prevalent in girls than boys (23). Olds et al. also reported that mean wake-up time in girls is 15 minutes later than boys only on holidays and not on school days (24).

There are some interpretations of the inconsistent reports about the effects of age and gender on sleep habits in the literature. Some studies did not report the time on their data collection (9-25). It seems that the data collection's time about children's sleep habits could contribute to these differences.

**Table 2.** Comparison of frequency of sleep problems in children by sex and age groups

Sleep problem	Total [n (%)]	Boys (%)	Girls (%)	Z	P-value
Resistance to sleep	8.1 (24)	8.5	7.6	-0.20	0.70
Hard awakening	21.5 (64)	23.1	20.0	-0.40	0.60
Nightmare	15.7 (47)	15.1	16.7	-0.20	0.80
Sleep walking	4.5 (14)	5.5	3.7	-0.40	0.60
Sleep-disordered breathing	5.1 (15)	5.4	4.9	-0.10	0.80
Waking up during the night	8.8 (26)	9.1	8.6	-0.04	0.90
Daytime sleepiness	7.0 (21)	10.6	4.2	-2.00	0.03*

\*: P-value < 0.05

In present study, sampling was done at the beginning of school. At this time, children have just returned from holidays, and tend to stay awake at the night, following problems in morning. Not only differences in study population but also various research tools and definitions of sleep problems can explain these different results (25). On the other hand, it is difficult to disentangle the impact of cultural habits on sleep problems, as with influence of culture on gender style, the practice of family co-sleeping in Asian societies, and differences in school performances and required tasks between Asian and Western countries (26-28).

Our study had some limitations. Since the information on children's sleep problems was collected from the parents, they may not have an accurate understanding of sleep problems in children. On the other hand, it is not possible to follow up on the participants who had not returned the questionnaires, and it is probable that there was a significant difference between them and other children.

Using questionnaire as the only diagnostic tool in our study was another limitation. Sleep disorders may not be well-evaluated despite the efforts of parents to respond correctly to questions. Therefore, we suggest collecting data using observational studies with polysomnography and actigraphy tools for objective measurement of sleep parameters.

## Conclusion

This study demonstrated that school-aged children do not get adequate sleep and that they have profound discrepancies in their sleep/wake patterns between school nights and weekend nights. Our findings showed some differences in sleep patterns of children in Kashan City compared to other communities. Sleep should be considered an important factor in the health of children but it could be influenced by cultural differences and school times in other areas. Most sleep disorders are detectable in school children and can be treated by supportive and conservative treatment. It is necessary to raise awareness of families, health educators, and school administrators in this area. Training sessions for parents on the importance of adequate sleep and sleep hygiene are recommended at schools.

## Conflict of Interests

Authors have no conflict of interests.

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