

Prevalence of Parasomnia in School aged Children in Tehran

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Objectives: Parasomnias can create sleep disruption; in this article we assessed parasomnias in school-aged children in Tehran .

Methods: In spring 2005, a total of 6000 sleep questionnaires were distributed to school-aged children in 5 districts of Tehran (Iran). A modified Pediatrics sleep questionnaire with 34 questions was used.

Results: Parasomnias varied from 0.5% to 5.7% among the subjects as follows: 2.7% sleep talking, 0.5% sleepwalking, 5.7% bruxism, 2.3% enuresis, and nightmare 4%. A group of children showed parasomnias occasionally- this was 13.1% for sleep talking, 1.4% for sleepwalking, 10.6% for bruxism, 3.1% for enuresis and 18.4% for nightmares .

Conclusion: A high proportion of children starting school suffer from sleep problems. In many cases this is a temporary, developmentally related phenomenon, but in 6% of the children the disorder is more serious and may be connected with various stress factors and further behavioral disturbances.

Keywords: *Child, Iran, Parasomnia, Prevalence, Schools*

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Parasomnias are all characterized as undesirable physical or behavioral phenomenon occurring during the sleep period. Sleepwalking, sleep terrors, and sleep talking are parasomnias associated with arousal that usually occur during the first third of sleep (Sadock and Benjamin, 2007). A great number of parasomnias are more common in childhood than in adulthood: Laberge and colleagues reported a high rate of 78% among 1353 subjects with age range of 3 -13 years, who experienced at least one episode of parasomnias during their lifetime (Laberge et al, 2000). In one study, association between sleep and behavior problems was assessed in school-aged children. Sleep problems were reported for 10.8% of the sample for the past 6 months. A history of sleep problems before age 2 was the best predictor of current sleep problems. Some sleep problems were very common such as snoring, tiredness during the day, and taking excessive time to fall asleep, occurring at least 1 night per week in over 20% of the total sample. Children rated highly on parasomnias showed more frequent falls and pica (Laberge et al, 2000).

In a survey assessing the prevalence of sleep disorders among 2 to 12 year olds in Beijing, China, the overall prevalence of sleep disorders was 21.2%

including bruxism (6.5%), sleep talking ([4.9%), e nuresis (1.0%)] and sleepwalking (0.6%)] (Stein et al 2001).

In another study conducted in India aiming to evaluate the sleep habits and problems of 103 school-aged children with age range of 3 to10 who were recruited from outpatient clinics , it was found that the average time of sleep at day (nocturnal and daytime nap) was 10.32 hours , and 28.2% of children took regular daytime nap.

Co- sleeping was seen in 93% of the children. The authors reported sleep related problems in 42.7% of children which included nocturnal enuresis (18.4%), sleep talking (14.6%), bruxism (11.6%) nightmares (6.8%), night terrors (2.9%) snoring (5.8%) and sleepwalking (1.9%).

On Univariate analysis, sleep related problems were considerably common if the family was nuclear (Fishers exact test; P = 0.01), younger (Mann Whitney U test; P= .04) and of less educated mothers (Mann Whitney U test; P=.04). However, when these predictors were entered simultaneously into a logistic regression model, only nuclear family was a significant predictor of sleep related disorders (odds ratio 2.41; CI; 1.04-5.57) (Liu et al ;2005).

The frequency of sleep problems in healthy school age children and among children who attend the general pediatricians' office for routine checkups highlights the importance of inquiring about potential sleep associated problems when children refer to child and adolescent psychiatrists since sleep disturbances may not be self-reported.

This study aims to investigate the prevalence of parasomnias in school age children residing in the capital of Iran, Tehran .

Although many researches confirm high rates of association between psychiatric disorders and sleep disorders in childhood and adolescence period, it is doubtful whether sleep problems increase vulnerability to psychiatric disturbances. Furthermore, there is not enough information on the relevance of environmental and background factors such as bothersome light and noise, somatic diseases, unfavorable living conditions, and family problems (Bharti et al, 2006; Laberge et al, 2000; Owens et al, 2001; Smedje et al, 2001).

Materials and Methods

A total of 6000 modified pediatrics sleep questionnaires (Gozal and et al, 2004) were distributed among 5-12 year old school-aged children who attended public schools in 5 districts of Tehran.

The schools in Tehran were stratified in to 5 large categories according to socioeconomic status of the areas. Then children were selected by random sampling; and this was done using a random table. The questionnaires were distributed by 8 investigators with either a degree in psychology or social work.

Consent was obtained from the parents of all the participating subjects. A modified pediatrics sleep questionnaire with 34 questions was used. Each question contained the following multiple choice answers: Almost always (more than 4 times/ week); frequently (3-4 times/ week); occasionally (2 times/ week); rarely (once/ week) and -never.

Pediatric Quality of Life Inventory (version 4.0) was completed by the parents on behalf of their children.

In addition to a descriptive presentation of the data, the statistical analysis tested the relationships between

sleep difficulties and parameters, by means of correlations (rank correlation according to Spearman) and relative risk. Group comparisons of children with and without sleep disorders were carried out by means of t tests for independent samples.

Results

Of the 6000 distributed questionnaires, 4309 were completed and returned .High dropout was plausible as the questionnaires were completed at home. According to the collected questionnaires, 1644 of the total sample were boys (38.2%) and 2665 were girls (61.8%). Based on age, 21.5% of children were 5-7 years old, 58.6% were 8-10 years old and 19.9% were over 10 years of age. When assessing the reported frequency of a given sleep disorder, it is important whether the problem occurs sometimes or often, but to increase the precision, we considered only almost always and frequently as "positive".

The corresponding figures for the parasomnias varied from 0.5% to 5.7% in the subjects as shown in table 1. The prevalence of sleep talking appeared to be equal between boys and girls (2.7%).

The prevalence of sleep walking seemed higher in boys [0.9%] than girls [0.3%]). Boys showed bruxism [6.8%] more than girls [5.1%]. Other parasomnias such as bruxism [6.8% vs. 5.1%], enuresis [3.4% vs. 1.7%] and nightmare [4.8% vs. 3.6%] were also higher in boys. A group of children showed parasomnias occasionally, this was 13.1% for sleep talking, 1.4% for sleepwalking, 10.6% for bruxism, 3.1% for enuresis and 18.4% for nightmares.

The prevalence of parasomnias according to different age groups is presented in table 2. The prevalence of parasomnias was assessed according to socioeconomic status. For this purpose, only the groups of children who had a relatively higher socioeconomic status (north of Tehran) were compared with residents of lower socioeconomic areas (south of Tehran). The results are demonstrated in table 3.

Discussion

Although the frequency of sleep problems among children starting school in this investigation is similar

Table 1. Prevalence of parasomnias based on sex

	Girls(n)	Girls (%)	Boys (n)	Boys (%)	p-value
Sleep talking	72	2.7%	45	2.7%	Non-significant
Sleepwalking	39.1	0.3%	60.9	0.9%	0.025
Bruxism	136	5.1%	111	6.8%	0.06
Enuresis	44	1.7%	55	3.4%	0.0001
Nightmare	95	3.6%	78	4.8%	Non-significant

Table 2. Prevalence of parasomnias based on age groups

	5-7 years (n)	5-7 years (%)	8-10 years (n)	8-10 years (%)	>10 years (n)	>10 years (%)	p-value
Sleep talking	17	2%	67	2.9%	23	2.9%	Non-significant
Sleepwalking	1	0.1%	9	0.4%	7	0.9%	0.05
Bruxism	58	6.8%	134	5.8%	45	5.6%	Non-significant
Enuresis	30	3.5%	56	2.4%	9	1.1%	0.002
Nightmare	28	3.3%	89	3.8%	41	5.1%	Non-significant

Table 3. Prevalence of parasomnias based on socioeconomic status (SES)

	High SES(n)	High SES (%)	Low SES (n)	Low SES (%)	p-value
Sleep talking	2	3.8%	106	2.6%	Non-significant
Sleepwalking	1	1.9%	17	0.4%	Non-significant
Bruxism	2	3.9%	232	5.8%	Non-significant
Enuresis	0	0%	95	2.4%	Non-significant
Nightmare	2	3.9%	158	4 %	Non-significant

to that of other epidemiological studies, the findings show that it is important to differentiate various types and severities of sleep disorders. The most common parasomnia in the present study was bruxism which was observed in 5.7% of the subjects.

Other researchers have found different prevalence percentages among children from different cultures and age groups, using different collection methods (Kwok et al, 2002; Restrepo et al, 2008; Alamoudi et al, 2001; Cheifetz et al, 2005; Barbosa et al, 2008). A cross-sectional study was carried out on 652 randomly selected children aged 7–10 years at public and private schools in Belo Horizonte, Brazil; and a 35.3% prevalence of bruxism was found (Serra-Negra et al, 2009). The literature suggests that bruxism is correlated with both experienced and anticipated life stress (Antonio et al, 2007).

The second common parasomnias were nightmares that were seen in 4% of children almost always and frequently, and occasionally in 18.4% of children (2 times a week). The prevalence figures for the parasomnias did not correspond with the findings of previous field studies. In one study, nightmares were especially frequent, but chronic parasomnias rarely persisted for an extended time in children (Fricke-Oerkermann et al, 2007). In a study by Neveus et al (2001), 5% of the sample had nightmares every night, just fewer than 5% of the studied population had nightmares every week, and around 52% at least once a month. In the study by Spruyt and et al (2005) almost 4% of the children had nightmares every week, and some authors, e.g., Rabenschlag (2000), reported notably higher figures

(almost 50% of the 6- to 12 year olds had parasomnias).

These differences should alarm physicians to ascertain both the type and the severity of sleep disorder as well as its negative effects on health. In a study conducted in America, nightmares were common, occurring weekly in 4%-10% of the population, and were increased when the patient was female and had younger age, increased stress, psychopathology, and dispositional traits (Fricke-Oerkermann et al, 2007).

In the present study, sleepwalking was higher in children who were over 10 years of age, and enuresis was higher in 5 to 7 years old children. This is similar to a study that found sleepwalking was highest among 11-12 year olds, but no sex difference was found (Klackenberg et al, 1982). In a Turkish sample, bruxism was the most common type of parasomnia which was similar to our study (Agargun et al, 2004).

In that study, 971 preadolescent school-aged children were selected from 4 locations in Turkey. They found that 14.4% of preadolescent school-aged children had parasomnias. Almost 1/6 of children had at least 1 parasomnia.

When the parasomnias were examined separately, bruxism, nocturnal enuresis, and night terrors were the most common parasomnias among both sexes. Parasomnias were seen higher in the 9- and 10-year-old age groups than in the other age groups. Higher rates of past physical illness, delays in toilet training, behavior disturbances, adjustment problems, and learning difficulties were more common in Children with parasomnias.

In our study, sleep talking, sleepwalking and enuresis were much higher in boys than girls, and it is not like the Turkish study. Bruxism is also higher in boys but the difference is only a trend (0.06).

In the present study, no difference was observed between high and low socioeconomic status and parasomnias. In one study, parasomnias and noisy sleep were inversely associated with socioeconomic status (SES). Children from lower SES families had higher scores on these factors than children from higher SES families (Ipsiroglu et al, 2001).

It must be pointed out, however, that the authors can make no statement with regard to causal direction, because on the one hand, it can be assumed that chronic sleep disorders have a negative impact on emotional state, but behavioral problems can lead secondarily to difficulties falling and staying asleep. Although sleep disorders often indicate other risks but they are seldom the primary reason to take children to physicians, thus the examining doctor should specifically ask about sleep problems and should

identify their causes. Physicians should give attention to accompanying psychiatric symptoms and psychosocial risks.

The principal limitation of the study is the relatively low response rate. However, special attention was paid to inclusion of schools from all parts of Tehran. In this regard, the response showed no systematic distortions. In order not to endanger the parents' willingness to cooperate, social variables were not included in the survey. Since school pupils from all districts of the city were included, the risk of distortion of social data was minimized.

Conclusion

A high proportion of children starting school suffer from sleep problems. In many cases this is a temporary, developmentally related phenomenon, but in 6% of the affected children, the disorder is more serious and may be connected with various stress factors and further behavioral disturbances. Sleep disorders may be a primary manifestation alarming the need for further diagnostic and therapeutic measures.

Precise attention should particularly be paid to parasomnias, because their regular occurrence can be a sign of stress. Establishing the degree of severity of parasomnias is also important. It is necessary to evaluate the relation between parasomnias and academic function in future studies. Comparison of sleep habits of parents with their children can clarify some solution to improve poor sleep habits in children.

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References

1. Agargun MY, Cilli AS, Sener S, Bilici M, Ozer OA, Selvi Y, et al. The prevalence of parasomnias in preadolescent school-aged children: a Turkish sample. *Sleep* 2004; 27: 701-705.
2. Alamoudi N. Correlation between oral parafunction and temporomandibular disorders and emotional status among Saudi children. *J Clin Pediatr Dent* 2001; 26: 71-80.
3. Antonio AG, Pierro VS, Maia LC. Bruxism in children: a warning sign for psychological problems. *J Can Dent Assoc* 2006; 72: 155-160.
4. Barbosa Tde S, Miyakoda LS, Pocztaruk Rde L, Rocha CP, Gaviao MB. Temporomandibular disorders and bruxism in childhood and adolescence: review of the literature. *Int J Pediatr Otorhinolaryngol* 2008; 72: 299-314.
5. Bharti B, Malhi P, Kashyap S. Patterns and problems of sleep in school going children. *Indian Pediatr* 2006; 43: 35-38.
6. Cheifetz AT, Osganian SK, Allred EN, Needleman HL. Prevalence of bruxism and associated correlates in children as reported by parents. *J Dent Child (Chic)* 2005; 72: 67-73.
7. Fricke-Oerkermann L, Pluck J, Schredl M, Heinz K, Mitschke A, Wiater A, et al. Prevalence and course of sleep problems in childhood. *Sleep* 2007; 30: 1371-1377.
8. Ipsiroglu OS, Fatemi A, Werner I, Tiefenthaler M, Urschitz MS, Schwarz B. [Prevalence of sleep disorders in school children between 11 and 15 years of age]. *Wien Klin Wochenschr* 2001; 113: 235-244.
9. Klackenberg G. Somnambulism in childhood--prevalence, course and behavioral correlations. A prospective longitudinal study (6-16 years). *Acta Paediatr Scand* 1982; 71: 495-499.
10. Ng DK, Kwok KL, Poon G, Chau KW. Habitual snoring and sleep bruxism in a paediatric outpatient population in Hong Kong. *Singapore Med J* 2002; 43: 554-556.
11. Labege L, Tremblay RE, Vitaro F, Montplaisir J. Development of parasomnias from childhood to early adolescence. *Pediatrics* 2000; 106: 67-74.
12. Levin R, Nielsen TA. Disturbed dreaming, posttraumatic stress disorder, and affect distress: a review and neurocognitive model. *Psychol Bull* 2007; 133: 482-528.
13. Liu X, Ma Y, Wang Y, Jiang Q, Rao X, Lu X, et al. Brief report: An epidemiologic survey of the prevalence of sleep disorders among children 2 to 12 years old in Beijing, China. *Pediatrics* 2005; 115: 266-268.
14. Montgomery-Downs HE, O'Brien LM, Holbrook CR, Gozal D. Snoring and sleep-disordered breathing in young children: subjective and objective correlates. *Sleep* 2004; 27: 87-94.
15. Neveus T, Cnattingius S, Olsson U, Hetta J. Sleep habits and sleep problems among a community sample of schoolchildren. *Acta Paediatr* 2001; 90: 1450-1455.
16. Owens JA. The practice of pediatric sleep medicine: results of a community survey. *Pediatrics* 2001; 108: E51.
17. Paavonen EJ, Aronen ET, Moilanen I, Piha J, Rasanen E, Tamminen T, et al. Sleep problems of school-aged children: a complementary view. *Acta Paediatr* 2000; 89: 223-228.
18. Rabenschlag U. Parasomnien im Kindesalter - Epidemiologie und klinische Bedeutung. *Wien Klin Wochenschr* 2000; 112: 3-4.
19. Restrepo CC, Vasquez LM, Alvarez M, Valencia I. Personality traits and temporomandibular disorders in a group of children with bruxing behaviour. *J Oral Rehabil* 2008; 35: 585-593.
20. Sadock BJ, Kaplan HI, Sadock VA. Kaplan & Sadock's Synopsis of Psychiatry: Behavioral Sciences/Clinical Psychiatry, 10th ed. Philadelphia: Lippincott Williams & Wilkins press; 2007.
21. Serra-Negra JM, Ramos-Jorge ML, Flores-Mendoza CE, Paiva SM, Pordeus IA. Influence of psychosocial factors on the development of sleep bruxism among children. *Int J Paediatr Dent* 2009; 19: 309-317.
22. Smedje H, Broman JE, Hetta J. Associations between disturbed sleep and behavioural

- difficulties in 635 children aged six to eight years: a study based on parents' perceptions. *Eur Child Adolesc Psychiatry* 2001; 10: 1-9.
23. Spruyt K, O'Brien LM, Cluydts R, Verleye GB, Ferri R. Odds, prevalence and predictors of sleep problems in school-age normal children. *J Sleep Res* 2005; 14: 163-176.
24. Stein MA, Mendelsohn J, Obermeyer WH, Amromin J, Benca R. Sleep and behavior problems in school-aged children. *Pediatrics* 2001; 107: E60.