

Sleep Habits in Students with Intellectual Disability

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Abstract

Background and Objective: Sleep habits not only are affected by a person's health but also affect his/her growth and development. Students with intellectual disability (ID) account for 3% of all students. Since sleep habits are among the basic foundations of learning during childhood, this study aimed to determine the parental view on the sleep habits of students with ID in Hamadan, Iran, during September 23 and December 21, 2019.

Materials and Methods: In this descriptive-analytical cross-sectional study, 86 students with ID, aged 7-11 years, were selected using the convenience sampling method in Hamadan, Iran, during September 23 and December 21, 2019. Data were collected using a demographic inventory, as well as the Children's Sleep Habits Questionnaire (CSHQ). The parental questionnaires were completed as self-reports by mothers or fathers of students with ID. Data were analyzed using the independent t-test, analysis of variance (ANOVA), and one-way regression in SPSS software.

Results: The mean \pm standard deviation (SD) of sleep habit score of students with ID was 73.66 ± 6.79 . The cut-off score in the questionnaire was 41.15% and 85% of the students had moderate and severe sleep disturbance. The highest mean score was for distress in morning awakenings (12.67 ± 2.83), indicating the presence of sleep disturbance among students with ID. Variables of age, sex, and weight of the students, educational attainment and job of parents, household income, private bedroom, and sleeping status could predict 61% of the students' sleep habits. There was a significant relationship between the father's job and the sleep habits of the students ($P < 0.05$).

Conclusion: These findings shed light on sleep disturbances in students with ID. Results suggest that sleep habits in students with ID are associated with their father's job. Sleep health should be considered in planning health promotion strategies of these children.

Keywords: Sleep; Insomnia; Sleep habits; Intellectual disability

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Introduction

It is identified-well that sleep is essential for students' physical and mental health (1). Sleep disturbance can affect the quality of life, school

competency, and behavioral performance (2, 3). Sleep disturbance is reported in children with a neurodevelopmental disorder (NDD) (4). NDDs include cerebral palsy (CP), autism spectrum disorder (ASD), fetal alcohol spectrum disorder (FASD), Down syndrome (DS), and Williams syndrome (WS) (5). NDD refers to an impairment of the development and growth of the central nervous system (CNS). Some degrees of mental

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retardation range from mild to severe (6). For the first time, the American Association of Intellectual Development Disability (AAIDD) used the term “mental retardation” in 1961, and intellectual disability (ID) was substituted for such terms as feeble-mindedness, moron, idiot, imbecile, and mental anomaly (7). ID changes to “mental retardation” in Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and International Classification of Diseases 11th Revision (ICD-11) (4). The student with ID is one before the age of 18 whose intelligence quotient (IQ) is < 70 with a restriction on two or more areas of adaptive skill covering the areas of communication, self-treatment, social/interpersonal, academic, and functional ability (8). They can learn some educational, language, and social skills and also get benefit from some regular educational programs, but their progress is slower than their normal peers (9). In total, 85% of all mentally-retarded children have mild mental retardation, 10% have moderate mental retardation, and 2-4% have severe mental retardation (10). Mental retardation, as a common form of non-progressive disability and pathology, has a prevalence of 1% (11); however, some studies have reported the prevalence of 2-3 percent of the total population in developed countries (12).

Sleep disturbances are commonly reported by parents of young children (13). Previous studies indicated that approximately 25% of preschool-aged children with normal development had sleep problems (14). Children with ASD (13, 15) CP (16, 17), or DS experience more sleep problems than the general population. About 40% to 80% of children with NDD have sleep disturbances such as frequent nocturnal awakenings, sleep onset delay, nightmares, and bed-wetting (18, 19).

In the current study, the researchers defined the students with ID as “the child who is unable to obtain the normal academic achievement level of his normal fellow students and has an IQ of 50-70, so this category is considered as the category of educable students” (9). “Sleep disturbance” covers both sleep disorders and sleep problems (4).

Since childhood is the basic foundation of healthy sleep habits and sleep patterns of adults are shaped almost in the age range of 6 to 11 years, preventing permanent disorders and poor sleep habits is very important in this age range. At school age, students acquire cognitive skills and healthy behaviors, and thus paying attention to

sleep habits is important to prevent the formation of unhealthy habits within this period (4). Sleep is one of the main areas of occupation in occupational therapy (20) and students with ID are among the target groups of occupation therapy since sleep disturbances are prevalent in this group of children. However, the patterns of sleep disturbances are not known to students with IDs. As a result, the present study aimed to determine parental views on the sleep habits of students with ID.

Materials and Methods

This cross-sectional descriptive-analytical study was conducted on 86 students with ID, aged 7 to 11 years, in Hamadan, during September 23 and December 21, 2019. The samples were selected using the complete convenience method. After the approval of the proposal and obtaining permission from Hamadan University of Medical Sciences, the researchers attended the General Directorate to obtain the list of schools for students with special needs. Then, the parents of these children were contacted and the research objectives were explained to them. Finally, all eligible students were selected.

The inclusion criteria were: Iranian nationality, lack of physical diseases or obvious physical disability, lack of a history of stressful events in the earlier year (loss of the first-degree family or migration), lack of emotional and academic problem leading to the hospitalization of children, not using sleeping medications, lack of known physical and mental diseases in parents, lack of using drugs by parents (based on mothers’ self-report), IQ score of 50-70, parental consent forms and oral consent of students, and parents having at least basic literacy. In total, 108 students were eligible, out of which nine students were excluded because of unwillingness to participate and 13 students were excluded because either they did not live with their families or their parents did not show up. Finally, 86 students participated in the study.

Data collection instruments included the demographic inventory (age, weight, height, sex, school grade, sleep onset time, and awakening time of students), and eight items were related to age, educational degree, job, telephone contact, and income of parents. Moreover, the sleep habits of children were measured using the Children’s Sleep Habits Questionnaire (CSHQ). The questionnaire was designed by Owens et al. (2000) to assess the children’s sleep habits at pre-school and

school age. The questionnaire is composed of 44 statements, scored in a three-point Likert scale: “usually” if the sleep behavior occurred five to seven times/week, “sometimes” for two to four times/week, and “rarely” for zero to one time/week. It reflects following sleep domains: sleep time (items 1, 2, 3, 5, 6, 7, 8, 9, 13, 14, 15, and 16), sleep behavior (items 4, 10, 11, 12, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, and 30), night awakening (items 31, 32, and 33), difficulty with morning awakening (items 34, 35, 36, 37, 38, 29, and 40), and sleepiness (items 41, 42, 43, and 44) (21, 22).

A high mean score demonstrates a high frequency of sleep disturbances and a low mean score demonstrates a low frequency of sleep disturbance (21, 22). Generally, a score > 41 demonstrates the presence of sleep disturbances (23).

CSHQ is a standard questionnaire with the validity and reliability of 0.97, obtained by Shoghy et al., using the content analysis and re-test method, respectively, in a study on ten 6-11-year-old children (24). Yousef Gomrokchi et al. reported a reliability of 0.78 for this questionnaire (21). The measured reliability in the present study was 0.747. To categorize sleep disturbances, their scores were converted into percent, and 0-33, 36-66, and 67-100 were considered mild, moderate, and severe sleep disturbances (23).

The collected data were entered into SPSS software (version 16, SPSS Inc., Chicago, IL, USA). Kolmogorov-Smirnov test was used to determine the normality of the data. To analyze the data, first the data were summarized using descriptive statistics and then the independent t-test, one-way analysis of variance (ANOVA), and multiple regression were

used to determine the correlation between the variables. $P < 0.05$ was considered as significant.

Results

In this study, a greater number of students were in the age range of 10-11 years (38.4%). 58.1% were first-grade elementary students. 25.46% were girls and 74.40% were boys. The mean age of students was 8.90 ± 1.14 , mean weight was 31.73 ± 10.82 kg, and mean height was 128.24 ± 20.68 cm.

The majority of fathers had less than a high school diploma (47.7%) and 51.2% were freelancers. Concerning the mother, 38.4% had a diploma or an associate degree, and the majority of them (65.1%) were unemployed. The highest mean family income was 500000 tomans to 1500000 tomans per month.

The sleep time of the students in the school days and holidays was 22.06 ± 1.87 and 22.47 ± 4.21 . In general, their mean sleep duration was 9.57 ± 1.56 hours per day. Their waking time in the morning was 7.34 ± 1.58 and 9.47 ± 2.00 in the school days and holidays, respectively (Table 1).

To determine the sleep habits of students in the study, the mean sleep habit of 73.66 ± 9.79 was obtained. The highest and lowest mean scores in the participating children belonged to difficulty with morning awakening (12.67 ± 2.83) and sleepiness (6.34 ± 1.76). Higher and lower mean scores indicated sleep disturbance and reduced sleep disturbance, respectively (Table 2).

According to the obtained data, 57% of the participating students did not have a private bedroom, 51.2% slept in their parents' room, and 48.8% slept in their parent's bed.

Table 1. Relationship between socio-demographic characteristics and sleep habits

Variable	Group	n (%)	P-value
Sex	Girl	22 (25.4)	0.13
	Boy	64 (74.4)	
Age (year)	7-8	13 (15.1)	0.34
	8-9	19 (22.1)	
	9-10	21 (24.4)	
	10-11	33 (38.4)	
Educational attainment of father	Less than a high school diploma	41 (47.7)	0.16
	Diploma and associate degree	17 (19.8)	
	Academic	25 (1.2)	
Educational attainment of mother	Less than a high school diploma	27 (31.4)	0.23
	Diploma and associate degree	30 (34.9)	
	Academic	26 (30.2)	
Father's job	Freelancer	44 (51.2)	< 0.01
	Governmental	13 (15.1)	
	Unemployed and worker	26 (30.2)	
Mother's job	Employed	30 (34.9)	0.15
	Housekeeper	56 (65.1)	

Table 2. Mean score of participating mentally-retarded students' sleep habits

Components of sleep habits	Mean ± SD	Lowest value	Highest value
Sleep time	22.64 ± 3.68	12.00	36.00
Sleep behavior	26.74 ± 5.30	18.00	46.00
Night wakening	5.16 ± 1.57	3.00	9.00
Morning awakening	12.67 ± 2.83	7.00	19.00
Sleepiness	6.34 ± 1.76	4.00	12.00
Sum (sleep habits)	73.66 ± 9.79	44.00	107.00

SD: Standard deviation

Variables of age, sex, and weight of the students, educational attainment, job, and income of parents, private bedroom, and sleeping status could predict 61% of the students' sleep habits (Table 3). Comparison of the mean sleep habit scores based on the fathers' jobs, using ANOVA, showed that there was a significant difference between different fathers' jobs and children's sleep habits. To compare the difference in mean scores of sleep habits based on the fathers' job, the post-hoc test was used based on the least significant difference (LSD) method. There was a significant difference in sleep habits between students whose fathers were workers or unemployed and students whose fathers were freelancers ($P < 0.05$) (Table 1).

To categorize sleep disturbances, their scores were converted into percent, and 0-33, 36-66, and 67-100 were considered mild, moderate, and severe sleep disturbances (23). In the present study, 15% and 85% of the students had moderate and severe sleep disturbance.

Discussion

The present study indicates a high prevalence of sleep disturbance among students with IDs. Consistent with the results, many studies have shown that children with IDs are affected by sleep disturbances (25). Obstructive sleep apnea (OSA) can be seen in almost 50%-80% of people with DS. Almost 46% and 21% of children with DS have a respiratory problem at sleep and sleep-

related movement disorder (26). Behavioral insomnia and problematic behaviors at night are common in Rett syndrome. The most prevalent problem in children with Rett syndrome is nighttime laughter, which is accompanied by crying at night in 60%-88% of younger girls (27). Sleep disturbances in children with ASD are reported to be accompanied by severe mental retardation (28).

In the present study, the mean score of sleep disturbance among students with ID was 73.66 ± 9.79 , indicating a high prevalence of sleep disturbance among them. In a study on sleep habits of school-age children, a mean sleep disturbance score of 80.0 ± 6.5 is reported in Japan (29). Van Litsenburg et al. in Holland (30) and Shamsaei et al. in Nahavnd, Iran, (22), reported the mean sleep disturbance score of 40.50 ± 0.59 , 43.10 ± 7.25 , and 64.72 ± 9.33 , respectively. The biological basis of sleep disturbances in mentally-retarded children may be due to misunderstanding of these children of peripheral signs (light-dark cycles and diet), as well as dysfunction of related hormones. These factors are involved in the creation of circadian rhythms and thus can affect the natural sleep-wake cycle (25). It also seems that lack of parental attention to this problem is a reason behind the high prevalence of this sleep disturbance, resulting in its chronicity, and this disturbance is regarded as a complication of children with IDs and their normal life.

Table 3. Coefficient of linear regression for predicting sleep habits (criterion variable) by variables of age, sex, and weight of students, educational attainment and job of parents, household income, private bedroom, and sleeping status

Predictors	B	t	P-value	Coefficient of determination (R)
Age	0.02	0.16	0.86	0.61
Sex	-0.23	-1.67	0.46	
Weight	-0.06	-0.89	0.37	
Educational attainment of father	-0.04	-0.28	0.77	
Educational attainment of mother	-0.11	-0.62	0.53	
Father's job	0.25	2.27	0.02	
Mother's job	0.08	0.10	0.47	
Household income	0.42	2.54	0.01	
Private bedroom	0.08	0.70	0.48	
Sleeping status	0.29	2.37	0.02	

Quine showed that sleep problems at night were more usual in children with IDs than in their normal peers. He reported a prevalence of 41% among children aged 4-12 years, and 27% in normal school-age children (31). Romeo et al. reported that a total of 46% of children with ASD had an uncommon score on at least one sleep factor; difficulty in initiating and maintaining sleep, parasomnias, and disorders of excessive somnolence demonstrated the highest rates among the sleep factors (32). A 13-86% prevalence of sleep disturbance is reported in mentally-retarded children with different severity. This prevalence is 8.6-14.8% among people with mild to moderate disorders, which includes mentally-retarded students (33). The probable reason behind the prevalence of sleep disturbances is the difference in clinical definitions of sleep disturbance and sampling in different studies.

The most and least prevalent sleep disturbance in the present study was related to difficulty with morning awakening and sleepiness, respectively, which is consistent with the results in the study of Ozgoli et al. (23). They conducted a study in Iran and indicated that 63.25% of children had moderate to severe sleep disturbances, 28.9% had sleep behavior disturbance, and 28.9% had difficulty in morning awakening (23). Liu et al. investigated children with ASD and found that almost 86% of the individuals suffered from at least one sleep disturbance every day, 45% had difficulty with morning awakening, and 31% had sleepiness during the daytime (34). However, Iwaware et al. in Japan (29) and Shamsaei et al. in Iran (22) reported sleep behavior disorder as the most common sleep disturbance. The difference observed in sleep habit disorder between the normal students and students with special needs is probably due to their ID in understanding school regulations, including timely presence at school, leading to difficulty with morning awakening, as the most prevalent disorder.

It is recommended that school-age children should regularly sleep 10-11 hours per day (35). Hawkins and Takeuchi conducted a cross-sectional study in America and found that 23-36 percent of 6-9-year-old and 30-41 percent of 10-13-year-old children had sleep disturbance (36). In the present study, the mean sleep duration per 24 hours was 9.57 ± 1.56 hours, which is acceptable and may be due to the similarity of rules and regulations in the special needs education and

normal education systems, such as school hours and holidays in Iran.

Since this study was a cross-sectional study, the cause-and-effect relationship could not be inferred. Moreover, the generalization of the results should be done cautiously because of the low sample size. In addition, the inferential analysis could not be applied to different groups of mentally-retarded students. Further, as with any self-report survey, responses may be subject to social desirability bias. Sleep characteristics were not compared between different students with ID (according to disease severity). Other sleep disorders especially OSA in DS or insomnia in autism, etc. were not evaluated.

Conclusion

The results showed that the factors of age, sex, weight, private bedroom, and sleeping status of students, educational attainment and job of parents, and household income were the most important parameters of sleep habits of mentally-retarded students. Moreover, these poor sleep habits were highly prevalent in this group of students (85%). Therefore, rehabilitation and psychology specialists need to plan therapeutic and educational solutions to eliminate this disturbance.

Conflict of Interests

Authors have no conflict of interests.

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