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The Prevalence of Sleep Disorders and the Related Factors in Iranian Preschool Children

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Quantitative Study

Abstract

Background: The prevalence of sleep disorders is different in international studies. Sleep disorders are among the most prevalent disorders among children. Various factors are involved in the pathogenesis of these disorders. The present study was conducted with the aim to determine the prevalence of sleep disorders and the related factors in Iranian preschool children.

Methods: This descriptive cross-sectional study was conducted on 384 children of 3-6 years of age in Isfahan, Iran, in 2020. The statistical population consisted of 17000 children in kindergartens under the supervision of the Isfahan Welfare Organization. Using Krejcie and Morgan's table, the children were selected through multi-stage cluster sampling. The data were collected by the Sleep Disturbance Scale for Children (SDSC) completed by mothers. The data were analyzed using Pearson and Spearman correlation, and multiple regression analysis in SPSS software.

Results: The results revealed that 19.01% of children (n = 37) had disorders of initiating and maintaining sleep (DIMS), 7.29% of children (n = 28) had sleep breathing disorders, 22.3% of them (n = 86) had sleep-wake transition disorders (SWTD), 23.1% of children (n = 89) had disorders of excessive somnolence (DOES), 16.9% of children (n = 65) had sleep hyperhidrosis, and 19.01% of them (n = 73) had sleep disorders or disorders of arousal nightmares in some cases. Regression analysis also showed that the incidence of sleep disorders was significantly related to gender and fathers' level of education, i.e., 1.1% of variations in children's sleep disorders were explained by gender ($P < 0.05$), and 3.1% of the variations was explained by fathers' level of education ($P < 0.001$).

Conclusion: The high prevalence of sleep problems among children necessitates informing parents and healthcare providers about the importance of healthy sleep patterns.

Keywords: Prevalence; Sleep disorder; Child; Preschool

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Introduction

Sleep is a complex physiological and behavioral process in which a person enters a state of unconsciousness and a lack of relative responsiveness to the environment (Kligman, Behraman, Jenson, & Stanton, 2007). Bad habits and some sleep disorders result from physical, psychological, environmental, and genetic conditions that reduce sleep quality and jeopardize one's health (Feng, Huang, Wang, Wei, Liu, & Qin, 2021).

Several studies have been conducted on children's sleep and have emphasized the necessity of the consideration of this issue by parents, health professionals, and health policymakers (Sadock, & Sadock, 2008). In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013), sleep-wake disturbances consist of 10 disorders or groups of disorders, including insomnia disorder, hypersomnolence disorder, narcolepsy, breathing-related disorders, circadian rhythm sleep-wake disorder, non-rapid eye movement (NREM) sleep behavior disorder, nightmare disorder, rapid eye movement (REM) sleep behavior disorder, result legs syndrome, and sleep disorders resulting from drugs (Li, Jin, Wu, Jiang, Yan, & Shen, 2007).

Sleep patterns change throughout life, and sleep disturbance is a common complaint in childhood and the fifth cause of referring to pediatricians (Kliegman et al., 2008). Still, it is underdiagnosed due to its different manifestations. Sleep disorder in children refers to an excessive increase or decrease in sleep according to age, types of abnormal sleep, abnormal behavior, or the occurrence of unusual events during sleep (American Psychiatric Association, 2013).

The prevalence of sleep disorders in international studies ranges between 1 and 43%, with increased prevalence among children (Singh & Kenney, 2013). Sleep disorders in children can affect the body, behavior, cognitive function, or long-term energy. MacLean, Fitzgerald, and Waters (2015) stated that the prevalence of sleep problems in children aged 3 to 6 years ranged between 15 and 30% and occurred primarily due to nighttime fears and nightmares, sleep-wake cycle, night waking, and obstructive sleep apnea. The most severe complication in pediatric sleep disorders is related to cognitive problems and often associated with depression, anxiety, and cognitive impairment (Mohsenzadeh, Farhadi, Tarrahi, & Pedram, 2009). Petit, Touchette, Tremblay, Boivin, and Montplaisir (2007) reported that sleep talking (74.4%), nighttime fears (39.8%), bedwetting (25%), sleepwalking (14.5%), bruxism (4.5%), and rhythmical movements (9.2%) were prevalent among children. Sleepwalking is accompanied by nighttime fears and sleep talking (Petit et al., 2007) Bharti, Malhi, and Kashyap (2006) studied 103 Indian children aged between 3 and 10 years and found that 42.7% of them had sleep disorders that included nightmares (2.9%), snoring during sleep (58%), and sleepwalking (1.9%). The prevalence of sleep disorders in Western children was between 24 and 40% (Acebo, Sadeh, Seifer, Tzischinsky, Hafer, & Carskadon, 2005), and in Asian children was between 70.1 and 82.8% (Meltzer & Moore, 2008). In Iran, the prevalence of sleep disorders among children ranged between 41.6 and 50.4% (*Sadat Hoseini*, 2013; Ozgoli, Sheikhan, Soleimani, Nasiri, & Amiri, 2016). BaHammam, AlFaris, Shaikh, and Bin (2006) reported that 37.5% of 5-9-year-old Saudi Arabian children had sleep disorders. Daytime fatigue was the most common sleep problem (37.5%), followed by sleeping with parents (12.4%), sleeping late (11.8%), and bedwetting (4.5%).

Sleep plays a vital role in childhood development and negatively affects children's physical, behavioral, emotional, and cognitive performance (MacLean et

al., 2015; Tikotzky, De Marcas, Har-Toov, Dollberg, Bar-Haim, & Sadeh, 2010). Children's sleep disorders result in parents' sleep disorders and can disrupt family functioning (Biggs, Lushington, van den Heuvel, Martin, & Kennedy, 2011). Furthermore, these disorders adversely influence child health and nutrition and can create stress and tension in the family and even cognitive disorders in adolescence (Otsuka et al., 2021). The consequences of sleep disorders in children vary, and include daytime drowsiness, headaches, behavioral problems, and poor daytime performance (Maski & Owens, 2016).

Sleep quality and quantity always depend on individual factors, such as age, gender, and psychological and environmental factors (Herwanto, Lestari, Warouw, & Salendu, 2018; Wills & Garcia, 2002). Furthermore, many socio-demographic factors affect sleep disorders, including parental education level, living in urban areas, and lack of adequate sleep hygiene (Taras & Potts-Datema, 2005). Socio-economic status, side effects of medications, and psychological (parental distress) and environmental (sleep environment and interaction with parents) factors might also affect sleep (Tietze et al., 2012). Some parents tend to set a time limit for staying awake, but do not know how to do it effectively. Sometimes, parents' problems, such as depression, illness, or marital issues, cause sleep disorders in children (Hoban, 2013). In addition to the effect of heredity on the development of sleep disorders in children, some researchers such as Jolin and Weller (2011), Krejcie and Morgan (1970), and Brockmann Diaz, Damiani, Villarroel, Nunez, and Bruni (2016) alluded to other environmental factors such as excessive television watching and access to other communication tools such as mobile phones and computers in the etiology of sleep disorders of children.

The high prevalence of sleep disorders in children emphasizes the importance of attending to the preschool age group. However, children's health care is an under-researched issue. Medical advances and social health form children's health patterns; therefore, the Healthy People initiative in 2020 took children's health into account (Hoban, 2013). Thus, sleep disorders should be considered in treatment planning because they may represent the initial stages of mental illnesses, and timely interventions preempt or reduce their incidence. Given the effect of sleep disorders on children's performance, behavior, cognition, self-concept, and self-esteem, the present study was conducted with the aim to determine the prevalence of sleep disorders and their related factors [e.g., the disorder of initiating and maintaining sleep (DIMS), sleep breathing disorder, disorder of arousal nightmares, sleep-wake transition disorder (SWTD), the disorder of excessive somnolence (DOES), sleep hyperhydrolysis] in 3-to-6-year-old children in Isfahan, Iran.

Methods

Study design, procedure, and sample recruitment: This descriptive cross-sectional study was conducted in Isfahan, Iran, in 2020. The statistical population consisted of 17000 children aged between 3 and 6 years in kindergartens under the supervision of the Isfahan Welfare Organization. Using Krejcie and Morgan's table(25), a sample of 384 children was selected through multi-stage cluster sampling. Children who suffered from medical diseases or consumed drugs for any reason by history of parents were not entered into the study. If parents did not accept to be in the study and did not complete the questionnaire completely, the child was excluded from the study.

The study protocol was primarily designed according to the ethical principles of the declaration of Helsinki and was approved by the Ethical Committee of Isfahan

University of Medical Sciences, Iran, with the code number IR.MUI.REC.1394.2.105.

First, the researchers obtained a list of the kindergartens from Isfahan Welfare Organization. Subsequently, 7 kindergartens from each area and 10 children from each kindergarten were randomly selected. The Sleep Disturbance Scale for Children (SDSC) was given to the mothers of the children at a parent-teacher meeting to complete at home and return to the kindergarten principal. The data were analyzed using Pearson and Spearman correlation and multiple regression analysis in SPSS software (version 22; IBM Corp., Armonk, NY, USA).

Instrument

Sleep Disturbance Scale for Children: The SDSC was developed by Bruni et al. in 1996 to evaluate sleep disorders in children aged between 6 and 15 years. This questionnaire is related to the sleep-wake rhythm and possible sleep problems and contains 27 items scored on a 5-point Likert scale. It measures the 5 subdomains of DIMS, sleep breathing disorders, disorders of arousal (DOA), sleep-wake transition disorders, DOES, and sleep hyperhidrosis (Bruni et al., 1996). This scale is completed by parents. SDSC was validated in Iran, and its reliability, estimated using Cronbach's alpha, was 0.82. The reliability of the scale estimated in the present study was 0.72. Score 50 was considered as the cut-off point to evaluate the prevalence of sleep disorders among children.

Results

As the results revealed, 12.2% of the children (n = 47) were from the first educational district, 16.7% (n = 64) from the second district, 16.7% (n = 64) from the third district, 6% (n = 23) and 16.7% (n = 64) from the fourth district, 19.5% (n = 75) from the fifth district, and 28.9% (n = 111) were from the sixth educational districts. Regarding the gender of the children, 48.7% (n = 187) were boys, and 51.3% (n = 197) were girls. Moreover, 11.2% (n = 43), 15.4% (n = 59), 24.5% (n = 94), and 48.7% (n = 187) of the children were 3, 4, 5, and 6 years of age, respectively. Regarding the fathers' age, 26.3% (n = 101), 23.6% (n = 91), 20.3% (n = 78), 19.2% (n = 74), and 1.5% (n = 6) of the children's fathers were 30-35, 36-40, 41-45, 46-50, and 51-55 years of age, respectively. Regarding the mothers' age, 7.44% (n = 172), 36.40% (n = 155), 6.4% (n = 18), and 1.3% (n = 5) of mothers were 24-30, 31-35, 36-40, and 41-47 years of age, respectively.

Regarding employment status, 65.6% of fathers (n = 252) were self-employed, 129.4% of fathers (n = 113) were government employees, and 3.1% of fathers (n = 12) were unemployed. Furthermore, 69% of mothers (n = 265) were housewives, and 30.7% of them (n = 118) were employed. Regarding birth order, 63.8% of the children (n=245) were the first child, 29.7% (n = 114) were the second, 5.2% (n = 20) were the third, 0.8% (n = 3) were the fourth, and one of them was the fifth child. Regarding sleep time, in 63.5% of the families (n = 244), parents and children slept at the same time, and in 34.9% of the families (n = 134), parents and children went to bed at different times. The prevalence of sleep disorders based on demographic information is presented in table 1.

The relationship of the educational district, parents' level of education and job, birth order, child-parent sleep synchronization, and parent's sleep time with the sleep disorders are presented in table 2.

As can be seen in table 2, DIMS were significantly correlated with the father's job, parent-child synchronization, and educational district ($P < 0.050$). Sleep breathing disorders were significantly correlated with age ($P < 0.001$). DOA were significantly correlated with the father's job and parents' level of education ($P < 0.001$).

Table 1. Prevalence of sleep disorders based on demographic information (number/percent)

	Disorder						
	DIMS	Sleep breathing disorders	DOA	SWTD	DOES	Sleep hyperhidrosis	Sleep disorders
Gender							
Female	36 (9.3)	9 (2.3)	0 (0)	49 (12.8)	37 (9.8)	38 (9.9)	37 (9.6)
Male	33 (8.5)	19 (4.9)	0 (0)	37 (9.6)	51 (13.2)	27 (7.03)	36 (9.3)
Birth order							
1	39 (10.1)	14 (3.6)	0 (0)	56 (14.5)	53 (13.3)	40 (6.8)	45 (8.6)
2	25 (6.6)	10 (2.5)	0 (0)	29 (7.4)	21 (4.9)	16 (4.2)	28 (7.3)
3	0 (0)	3 (0.7)	0 (0)	1 (0.2)	10 (2.31)	9 (1.52)	0 (0)
4	2 (0.5)	1 (0.2)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.2)
5	1 (0.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.2)
Father's age (year)							
30-35	3 (0.7)	2 (0.5)	0 (0)	3 (0.7)	4 (1.04)	1 (0.2)	2 (0.5)
36-40	0 (0)	0 (0)	0 (0)	1 (0.2)	1 (0.2)	2 (0.5)	1 (0.2)
41-45	3 (0.7)	2 (0.5)	0 (0)	3 (0.7)	4 (1.04)	2 (0.5)	3 (0.7)
46-50	1 (0.2)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.2)	1 (0.2)
51-55	1 (0.2)	1 (0.2)	0 (0)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)
Mother's age (year)							
24-30	3 (0.7)	1 (0.2)	0 (0)	1 (0.2)	3 (0.7)	0 (0)	1 (0.2)
31-35	1 (0.2)	3 (0.7)	0 (0)	3 (0.7)	0 (0)	1 (0.2)	1 (0.2)
36-40	4 (1.0)	1 (0.2)	0 (0)	0 (0)	5 (1.3)	1 (0.2)	4 (1.04)
41-45	1 (0.2)	1 (0.2)	0 (0)	1 (0.2)	0 (0)	1 (0.2)	1 (0.2)
46-50	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Educational district							
1	7 (1.8)	4 (1.1)	0 (0)	9 (2.3)	9 (2.3)	7 (1.8)	8 (2.1)
2	14 (3.6)	5 (1.3)	0 (0)	13 (3.38)	19 (4.9)	12 (3.1)	13 (3.3)
3	5 (1.3)	2 (0.5)	0 (0)	6 (1.5)	9 (2.3)	8 (2.1)	5 (1.3)
4	2 (0.5)	0 (0)	0 (0)	5 (1.3)	5 (1.3)	4 (1.0)	5 (1.3)
5	14 (3.6)	4 (1.1)	0 (0)	16 (4.1)	20 (5.2)	16 (4.1)	11 (2.8)
6	25 (6.5)	13 (3.4)	0 (0)	38 (9.9)	27 (7.0)	16 (4.1)	31 (8.1)
Father's job							
Self-employed	42 (10.9)	16 (4.6)	0 (0)	(15.1)58	67 (17.3)	43 (11.1)	25 (6.5)
Government employee	42 (10.9)	16 (4.6)	0 (0)	23 (5.9)	19 (4.9)	22 (5.7)	42 (10.9)
Unemployed	0 (0)	0 (0)	0 (0)	7 (1.8)	3 (0.7)	0 (0)	6 (1.5)
Father's education							
Elementary school	5 (1.3)	1 (0.1)	0 (0)	4 (1.0)	5 (1.3)	6 (1.5)	6 (1.5)
Guidance school	11 (2.8)	2 (0.1)	0 (0)	19 (4.9)	11 (2.8)	7 (1.8)	16 (4.1)
Diploma	26 (6.7)	10 (3.1)	0 (0)	35 (9.1)	41 (10.7)	23 (5.9)	0 (0)
Associate degree	4 (1.0)	1 (0.1)	0 (0)	4 (1.0)	7 (1.8)	7 (1.8)	4 (1.0)
Bachelor's	14 (3.6)	12 (3.1)	0 (0)	21 (5.4)	19 (4.9)	14 (3.6)	17 (4.4)
Master's	7 (1.8)	2 (0.09)	0 (0)	3 (0.7)	5 (1.3)	7 (1.8)	7 (1.8)
PhD	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.2)	0 (0)	0 (0)
Expertise	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Mother's education							
Elementary school	12 (3.1)	1 (0.2)	0 (0)	4 (1.0)	4 (1.0)	3 (0.7)	5 (1.3)
Guidance school	13 (3.3)	0 (0)	0 (0)	11 (2.8)	7 (1.8)	15 (3.9)	4 (1.0)
Diploma	13 (3.3)	14 (3.6)	0 (0)	37 (9.6)	36 (9.3)	13 (3.3)	28 (7.2)
Associate Degree	(3.1)12	(0.5)2	0 (0)	8 (2.0)	11 (2.8)	6 (1.5)	9 (2.3)
Bachelor's	14 (3.6)	(1.8)7	0 (0)	24 (6.2)	30 (7.8)	23 (5.9)	24 (6.2)
Master's	1 (0.1)	2 (0.5)	0 (0)	2 (0.5)	1 (0.1)	3 (0.7)	2 (0.5)
PhD	1 (0.2)	1 (0.2)	0 (0)	0 (0)	0 (0)	2 (0.5)	1 (0.2)

Table 1. Prevalence of sleep disorders based on demographic information (number/percent) (continue)

	Disorder						
	DIMS	Sleep breathing disorders	DOA	SWTD	DOES	Sleep hyperhidrosis	Sleep disorders
Mother's job							
Housewife	48 (12.4)	20 (5.2)	0 (0)	63 (69.4)	67 (17.4)	41 (10.6)	56 (14.5)
Employed	19 (4.9)	8 (2.08)	0 (0)	23 (5.9)	22 (5.7)	24 (6.2)	17 (4.4)
Parents-child sleep synchronization							
Yes	47 (12.5)	16 (4.1)	0 (0)	63 (16.3)	63 (16.3)	41 (10.7)	47 (12.2)
No	20 (5.1)	14 (3.6)	0 (0)	23 (5.9)	26 (6.7)	24 (6.2)	26 (6.7)
Time of parents' sleep							
9-11	23 (5.9)	2 (0.5)	0 (0)	9 (2.3)	4 (1.0)	6 (1.56)	5 (1.3)
11-1	23 (5.9)	(6.5)25	0 (0)	73 (19.0)	82 (21.3)	53 (13.8)	65 (16.9)
1-3	21 (5.4)	1(0.2)	0 (0)	4 (1.0)	3 (0.7)	7 (1.8)	3 (0.7)

DIMS: Disorders of initiating and maintaining sleep; SWTD: Sleep-wake transition disorders; DOA: Disorders of arousal; DOES: Disorders of excessive somnolence

SWTD showed a significant relationship with the mother's level of education ($P < 0.001$). DOES had a significant relationship with birth order and parents' level of education ($P < 0.001$). Sleep hyperhidrosis was related to gender and mother's job ($P < 0.001$), and the incidence of sleep disorders showed a significant relationship with gender and parents' level of education.

According to table 3, only gender and father's level of education explained the variance in sleep disorders ($P < 0.050$), whose coefficients are presented in table 4.

Table 2. Correlation of demographic information and children's sleep disorders (Part I)

Demographic information	DIMS	Sleep breathing disorders	DOA	SWTD
Gender	-0.09	-0.14**	-0.06	0.02
Birth order	0.06	0.09	0.05	-0.07
Educational district	*0.10	0.01	0.01	0.06
Father's age	-0.07	-0.02	-0.00	-0.07
Mother's age	0.07	-0.01	-0.01	-0.07
Father's job	0.13**	-0.05	**0.10	-0.09
Mother's job	0.00	0.03	-0.03	-0.03
Father's education	-0.04	-0.03	**0.19	-0.20**
Mother's education	-0.00	0.07	**0.12	-0.07
Parents-child sleep synchronization	-0.14**	0.03	0.04	-0.04
Parents' sleep time	-0.04	0.06	-0.04	0.01
Gender	-0.09	-0.14**	-0.06	0.02

Table 2. Correlation of demographic information and children's sleep disorders (Part II)

Demographic information	DOES	Sleep hyperhidrosis	Sleep disorders
Gender	-0.09	-0.21**	-0.12**
Birth order	0.11**	-0.05	0.05
Educational district	0.02	-0.01	0.07
Father's age	-0.05	-0.04	-0.08
Mother's age	-0.07	-0.04	0.08
Father's job	-0.08	-0.04	-0.05
Mother's job	-0.03	0.25**	-0.05
Father's education	0.18**	0.02	-0.17**
Mother's education	-0.17**	0.06	-0.07
Parents-child sleep synchronization	0.04	0.01	-0.05
Parents' sleep time	-0.09	0.04	-0.02
Gender	-0.09	-0.21**	-0.12**

DIMS: Disorders of initiating and maintaining sleep; DOA: Disorders of arousal; SWTD: Sleep-wake transition disorders; DOES: Disorders of excessive somnolence

Table 3. Beta coefficients in predicting factors related to children's sleep disorders

Model 1	Unstandardized coefficients		Standardized coefficients	t	P-value
	B	Standard error	Beta		
Constant	50.36	5.08		9.91	< 0.01
Educational district	0.32	0.34	0.06	0.93	0.35
Gender	-2.12	0.96	0.11	-2.19	0.02
Child's age	-0.68	0.47	-0.07	-1.44	0.15
Father's age	0.51	0.31	0.71	1.62	0.10
Mother's age	-0.61	0.35	-0.78	-1.76	0.07
Father's job	0.88	0.93	0.05	0.94	0.34
Mother's job	0.26	1.11	0.01	0.24	0.81
Father's education	-0.63	0.21	-0.22	-3.01	0.00
Mother's education	0.23	0.26	0.06	0.86	0.38
Birth order	0.68	0.62	0.06	1.09	0.27
Parents-child sleep synchronization	-0.01	0.49	-0.00	-0.02	0.98
Parents' sleep time	0.05	0.21	0.01	0.25	0.80

As shown in table 4, gender and father's level of education, respectively, explained 1.1% ($P < 0.050$) and 3.1% ($P < 0.001$) of the variance in children's sleep disorders.

Discussion

This study was conducted with the aim to find the prevalence of sleep disorders and the related factors in Iranian preschool children.

The results of this study showed that the prevalence of DIMS, SWTD, and sleep hyperhidrosis was higher in girls compared to boys. Sleep breathing disorders and DOES were more prevalent among boys. In general, gender differences in the prevalence of sleep disorders were not significant. The only difference was in the type of the reported disorder.

The results also revealed that the prevalence of sleep disorders was higher in children who were the first born. Regarding the six educational districts, the children in the sixth district had the highest prevalence of sleep disorders. However, there was not much difference in the prevalence of disorders based on parent's age.

The prevalence of sleep problems was higher in children of self-employed fathers and housewife mothers. Regarding parents' level of education, the highest prevalence of sleep disorders was found in the children whose parents had a diploma. The lowest prevalence of sleep disorders was found in children whose parents held PhD degrees. Furthermore, the highest prevalence of sleep disorders was found when the parent-child sleep time was the same and when parents slept between 11 pm and 1 am. Moreover, findings showed that there was a weak relationship between being female and sleep disorders, and the higher the father's level of education, the lower the sleep disorders.

These findings were consistent with that of Bharti et al. (2006) and Mohsenzadeh et al. (2009), who reported sleep disturbances in 3-to-6-year-old children. The prevalence of sleep disorders in these children could be due to a lack of suitable sleep patterns adopted by parents. Other causes can be environmental factors such as noise and light (Brockmann et al., 2016).

Table 4. Regression coefficients of gender and father's level of education in predicting children's sleep disorders

Variable	R	R square	Sum of Squares	Degrees of freedom	F	P-value
Gender	0.10	0.01	367.90	1	4.15	0.04
Father's education	0.17	0.03	1029.64	1	11.92	< 0.01

Stress and fear also lead to sleep disorders in children (Kliegman et al., 2008). Furthermore, the prevalence of these disorders might be related to children's or parents' physical and psychological problems or feeling insecure, a toxic home environment, genetic problems, and pregnancy-related factors.

DIMS were observed in 17.4% of the children (n = 67) the cause of which might be nutrition. Feeding during the night might increase the problem of initiating and maintaining sleep. Increased fluid intake leads to an increase in urine, which causes the problem of maintaining sleep. Furthermore, daytime struggles lead the child to sleepless nights. It is also essential to consider family relationships and parental behavior in this regard (Li, Jin, Wu, Jiang, Yan, & Shen, 2007).

The prevalence of sleep breathing disorders was found to be 7.29% (n = 28) which is in line with the findings of Bharti et al. (2006), and Jalilolgadr, Barikani, and Soltanzadi (2014). According to the DSM (American Psychiatric Association, 2013), daytime sleepiness or nighttime sleeping problems observed in children with sleep breathing disorders are caused by a physical factor, i.e., the relaxation of the upper respiratory tract muscles, as a result of which, the airway narrows and makes breathing more difficult (Kliegman et al., 2008). Usually, people are unaware of nighttime breathing problems and do not associate their sleep problems to breathing. In fact, those who sleep beside them are aware of this problem. Similarly, the breathing problems of children who sleep alone are not reported. In addition, some people do not consider snoring a disorder and do not report it. Therefore, the prevalence of the reported breathing disorders is low.

No incidence of nightmares was reported in this study, which is inconsistent with the findings of Bhati et al. (2006) and Petit et al. (2007). Theoretically speaking, nightmare disorder is due to the over-stimulation of the central nervous system and stressful parents who pass their stress and anxiety to their children. In explaining this inconsistency, it can be argued that since mothers completed the SDSC, they might not have accurately evaluated this disorder or not have reported it due to cultural reasons.

The results revealed that 22.3% of the children (n = 86) had SWTD, which was in line with the results of Petit et al. (2007), Jalilolgadr et al. (2014), and Mohsenzadeh et al. (2009). SWTD are associated with disorders such as hypnic jerks, rhythmic movements of sleep, hallucinations before sleep, bruxism, and sleep talking.

In explaining these findings, it can be stated that the prevalence of this disorder is influenced by factors such as stress, tension, and heredity. Sleep talking can be due to lack of sleep, lack of sleep hygiene, anxiety and stress, and the use of certain medications (Jalilolgadr et al., 2014; Alfonsi, D'Atri, Scarpelli, Mangiaruga, & De Gennaro, 2019). Stefani and Högl [2021] stated the central nervous system or autonomic nervous system plays a more significant role in bruxism than environmental factors, but sensory-environmental factors might interfere with sleep-wake mechanisms that cause bruxism (Alfonsi et al., 2019; Stefani & Högl, 2020). Moreover, psychological factors such as stress, hyperactivity, obstructive sleep apnea/hypopnea syndrome (OSAHS), restless legs syndrome, and iatrogenic disease may cause bruxism (Stefani & Högl, 2020).

It is noteworthy that SWTD were among the disorders addressed in the present study, but other studies specifically addressed these disorders and reported different prevalence rates. Given that the quality and quantity of sleep, in addition to the body's physiological state, is affected by various psychological and social factors, especially lifestyle, variability in the prevalence of sleep disorders in different countries is not far off the mark (Montplaisir, Zadra, Nielsen, & Petit, 2017).

More than 23.1% of 3-to-6-year-old children (n = 89) had DOES. These disorders are mainly related to difficulty waking up, fatigue, sleep paralysis, daytime sleepiness, sleep attacks, and bedwetting. This finding is in line with that of Bahammam et al. (2006). In explaining the finding related to the bedwetting problem, it can be stated that positive family history, history of urinary tract infection, depression, anxiety, family size, and parent's level of education are associated with bedwetting. Urinary incontinence or enuresis is a common psychosomatic symptom that is found either alone or with other disorders such as anxiety in children and adolescents (Montplaisir et al., 2017; Jahanpour, Azodi, & Ghasemi, 2004). Furthermore, Hamed, Fawzy, and Hamed (2021) reported that bedwetting was related to gender, family history, physical punishment, family size, and urgency of urination.

Research has shown that sleep deprivation reduces the immune system and hypothalamus functioning, causes variability in blood pressure, increases the risk of cardiovascular events, and lowers the individual's mental and physical abilities. Furthermore, irritability, aggression, and reduced social relations are significantly higher in sleep-deprived individuals (Kamphuis & Lancel, 2015). Many sleep disorders are life-threatening; therefore, it is essential to identify the treatments that alleviate anxiety symptoms and their related disorders, such as bedwetting.

Sleep hyperhidrosis includes sweating during sleep and perspiring during the night. Findings revealed that 16.9% of the children (n = 65) had sleep hyperhidrosis. This disorder was also reported by Brockmann et al. (2016), Mohammadi et al. (2007), and Jalilolgadr et al. (2014). However, the differences in the reported prevalence rates might be because sleep hyperhidrosis was one of the disorders addressed in the present study, while some studies specifically addressed this disorder. Another reason might be that the present study participants were children, and research has shown that sweating problems decrease as children get older.

The findings also revealed that the prevalence of sleep disorders was higher in the first children than in other children. However, there was no significant difference in the prevalence of sleep disorders by parents' age. Regarding district, the highest prevalence rate of sleep disorders was found in the sixth educational district. Moreover, more sleep disorders were reported in children whose fathers were self-employed and mothers were housewives. Regarding sleep disorders and parents' level of education, the highest prevalence rate was among children whose parents had a diploma, and the lowest prevalence rate was among the children whose parents were PhD holders. Furthermore, the highest prevalence of sleep disorders was found when parent-child sleep time was the same and when parents slept between 11 pm and 1 am**.**

The incidence of sleep disorders showed a significant relationship with gender and parents' level of education. In other words, there was a weak relationship between being female and sleep disorders, and the higher the father's level of education was, the lower the sleep disorders were. The father's level of education explained 3.1% of the variance in children's sleep disorders, which is consistent with findings of Jalilolghadr, Pakpour-Hajiagha, Heidaralifard, and Pakzad , (2023). Regarding education, parents should have enough information and knowledge about their children to fulfill their responsibilities and control their emotions appropriately. They need to know how to treat their children, educate them, and solve their problems. Highly educated parents might act better in both acquiring knowledge and information, and treating children (Assari, 2021). Gender explained 1.1% of the variance in children's sleep disorders. This finding is consistent with the findings of

Jalilolghadr et al. (2023) and Mohsenzadeh et al. (2009), and is inconsistent with the findings of Fricke-Oerkermann et al. (2007).

Conclusion

In general, the high prevalence of sleep disorders in 3-to-6-year-old children deserves special attention. If left untreated, childhood sleep disorders cause complications such as impaired attention and concentration, memory and learning disorders, and behavioral disorders (Sinha & Guilleminault, 2010), so early detection and diagnosis of these disorders facilitate the development of programs to control them. Therefore, it is suggested that appropriate strategies and health programs be developed to promote children's sleep hygiene by providing conservative and non-drug treatments for most sleep disorders, raising families' awareness through schools and teacher-parent meetings, and reducing stressful conditions. Furthermore, due to the scarcity of national studies on sleep disorders and the lack of theoretical explanations and research, it is recommended that future researches address children's sleep disorders and their related factors. The high prevalence of sleep problems found in this study signifies the importance of healthy sleep patterns and increasing the awareness of parents and health care providers in this regard.

Conflict of Interests

Authors have no conflict of interests.

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