INTERNATIONAL JOURNAL OF CURRENT MEDICAL AND PHARMACEUTICAL RESEARCH
ISSN: 2395-6429, Impact Factor: 4.656
Available Online at www.journalcmpr.com
Volume 7; Issue 04(A); April 2021; Page No.5750-5753
DOI: http://dx.doi.org/10.24327/23956429.ijcmpr2021041004

Research Article

THE IMPACT OF CHILDHOOD SLEEP HABITS AND QUALITY ON ACADEMIC PERFORMANCE

Sara Alharbi[1]., Shahad Alruwaili[1]., Faris Binyousef[1]., Sadeem Alonazi[1]., Lena Alsaleem[1]., Alanoud Alhenaki[1]., Hanan Aljohani[1] and Alanoud Aljarbou[2]

[1]Medicine, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia
[2]Consultant Pediatrician, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

ARTICLE INFO

Article History:
Received 06th January, 2021
Received in revised form 14th February, 2021
Accepted 23rd March, 2021
Published online 28th April, 2021

Key words:
Pediatrics, Sleep habits, Academic performance

ABSTRACT

Background: Sleep is essential for preserving physical and psychological health and developing children's cognition, emotions, and behavior. This study aimed to document the sleep habits of children aged six to 17 years in Saudi Arabia and the relationship between healthy sleep habits and children's academic performance.
Methods: This is a cross-sectional study conducted in Saudi Arabia using the connivance sampling technique. We distributed surveys to parents regarding their children's sleep habits, demographic information, and academic performance. The surveys were distributed electronically through social media to the parents for self-completion, and each parent provided informed consent to participate in this study. The survey was created using a validated tool: the Child and Adolescent Sleep Checklist (CASC). CASC scores of 18 or higher indicate poor sleep, and lower scores indicate better sleep. The data were analyzed by IBM SPSS Statistics for Windows, Version 22.0. (Armonk, NY: IBM Corp.). We used the chi-squared test to determine statistical significance between dependent and independent categorical data, and $p \leq 0.05$ was considered significant.
Results: This study included 335 respondents. Most children were aged eight to 10 years (42.4 %), and 54.3% were females, 45.7% were males. According to the CASC questionnaire, 11.9% of children had a CASC score >18, which indicates sleep problems. Lower CSAC scores (indicating better sleep habits) were significantly associated with better academic scores ($p=0.001$). Moreover, children with sleep problems have a 5.46-fold higher risk of difficulty studying than those without sleep problems (odds ratio, 5.46; 95% confidence interval, 1.738 and 17.155; $p=0.003$).
Conclusion: We found a relationship between sleep quality and academic performance in children and adolescents. Improving the sleep quality of children should be a primary goal among parents, educators, and physicians. More investigations about the effect of demographic factors on sleep patterns and controlling these demographic factors should be conducted.

INTRODUCTION

Sleep is a state of reduced consciousness and movement vital for preserving psychological and physical health [1]. Sleep is a critical factor in children's growth and development of cognition, emotional wellbeing, and behavior [2]. Good sleep needs sufficient time, consistency, continuity free of perturbation.

According to one study, adolescents in Saudi Arabia report inadequate sleep, which affected intellectual, social, mental health, academic performance, drug abuse, and sleepy driving [3]. An Australian study of children aged five to 17 years reported a negative relationship between sleep and school achievement, and late sleeping at the end of the week correlated to lower school performance [4]. A population-based study in Saudi Arabia composed of 274 students of schoolgirls aged nine to 14 years found that most children had difficulties in sleep and felt particularly drowsy for most of the daytime, and the study found a weak relationship between symptoms of poor sleep and school grades [5].

This study aims to document the sleep habits of Saudi Arabian children ages six to 17 years, and the relationship between healthy sleep habits, academic performance, and social skill development.

MATERIALS AND METHODS

We conducted a cross-sectional study to assess the impact of childhood sleep habits and quality on academic performance and social life among children in Saudi Arabia. The study design was approved by the Imam Mohammad Ibn Saud Islamic University Institutional Review Board. The study population consisted of pediatric patients aged six to 17 years living in Saudi Arabia. The data were collected via an online questionnaire administered to parents regarding their children's sleep, academic performance, and social

Corresponding author:* **Sara Alharbi
Medicine, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

development. All participating parents provided informed consent to be included in the study. We omitted any surveys if parents did not provide consent to be included, and we omitted surveys completed on behalf of children younger than six or older than 17 years.

The questionnaire was divided into three categories. The first category focused on demographic and academic performance data. The next category collected data on sleep habits and sleep quality using a validated instrument, the Child and Adolescent Sleep Checklist (CASC) [6]. CASC scores higher than 18 indicated sleep problems. The final category focused on the child's quality of life. The data were analyzed by IBM SPSS Statistics for Windows, Version 22.0. (Armonk, NY: IBM Corp.). Results were presented as frequency and percent or mean and standard deviation. We used the chi-squared test to determine statistical significance between dependent and independent categorical data, and $p \leq 0.05$ was considered significant.

RESULTS

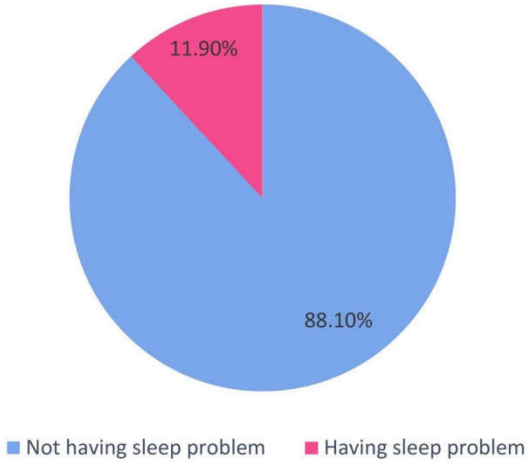
A total of 64 survey responses were omitted for failing to meet our inclusion criteria. A final total of 335 respondents participated in the study. Most children were aged eight to 10 years (42.4%), and 54.3% were females, 45.7% were males. Approximately half of the respondents lived in Riyadh's central region (48.7%). Most children did not have any chronic diseases (94.9%), and most of them had started school (96.1%). Most parents described their child's academic level as excellent or good, and 69.0% reported that their children sometimes face difficulty while studying their lessons (Table 1).

Table 1 Demographic factors of children as reported by their parents (N=335)

	Variables	Frequency (n)	Percent
Age of child (years)	6-8	87	26.0
	8-10	142	42.4
	11-13	75	22.4
	14-17	31	9.3
Gender of child	Male	153	45.7
	Female	182	54.3
Residency	Northern region	22	6.6
	Central region	163	48.7
	Southern region	52	15.5
	Western region	73	21.8
	Eastern region	25	7.5
Chronic diseases	Yes	17	5.1
	No	318	94.9
Studying/entered school	Yes	322	96.1
	No	13	3.9
Academic level	Excellent	152	45.4
	Very good	142	42.4
	Good	31	9.9
	Weak	8	2.4
Having difficulty while studying and doing homework?	Always	21	6.5
	Sometimes	222	69.0
	Never	79	24.5

The mean CASC score was 9.83 with a standard deviation of 5.53. Among respondents, 11.9% of the children had sleep problems, according to CASC scores of 18 or higher (Figure 1).

More than half of the sample would not wake up in the middle of the night (57.9 %). However, most children had difficulty waking up for school (17.3% always and 59.7% sometimes). Moreover, 35.8% of children would need less than 20 minutes to fall asleep, and 68.7% needed less than 15 minutes to wake up for school.



Furthermore, most parents reported that their children got excellent or nearly enough sleep. However, 65.4% indicated that their children need someone to wake them up, and only 28.4% of children woke up independently Furthermore, 70.4% of children sleep with siblings (Table 2).

Table 2 Frequency of sleep patterns among children reported by parents using CASC

Item		Frequency	Percent
Waking up in the middle of the night	Never	194	57.9
	One time	104	31.0
	Two times	31	9.3
	Three time	6	1.8
Having difficulty waking up in the morning on school days	Always	58	17.3
	Sometimes	200	59.7
	Never	77	23.0
Time needed to fall asleep	Less than 20 minutes	120	35.8
	Less than 40 minutes	88	26.3
	Less than 1 hour	66	19.7
	More than one hour	61	18.2
Amount of sleep at night	Not getting enough sleep	33	9.8
	Gets nearly enough sleep	161	48.1
	Gets an excellent amount of sleep	141	42.1
Waking up in the morning:	Has to be awaken by someone	217	65.4
	Wakes up by him/herself	95	28.4
	Wakes up by him/herself with an alarm clock	21	6.2
Time needed to get out of bed after waking up	Less than 15 minutes	229	68.7
	15 to 30 minutes	79	23.7
	More than 30 minutes	26	7.8
Who sleeps in the same room with the child at night?	With parent	53	15.9
	With brothers and sisters	235	70.4
	Alone	46	13.8

Abbreviation: CASC, child and adolescent sleep checklist.

Table 3 presents the difference in children's sleep patterns between school days and weekend days. During the school week, 39.4% of children would go to sleep after 10 PM, and during weekends, 88.4% reported going to sleep after 10 PM. The same trend was present in wake-up data, where 49.3% of respondents reported that children wake up at 6 AM on school days, and only 1.2% reported waking up at 6 AM on weekend days. We found that 42.1% of children would sleep for more than eight hours on the weekend, and only 21.8 % slept more than eight hours on school days.

Table 3 Difference of sleep patterns of children between school days and weekend days

Item		On School Days		During the weekend	
		Frequency	Percent	Frequency	Percent
Time of going to sleep	7 PM	15	4.5	0	0.0 %
	8 PM	50	14.9	0	0.0 %
	9 PM	67	20.0	8	2.4
	10 PM	71	21.2	31	9.3
	after 10 PM	132	39.4	296	88.4
Time of waking up	5 AM	78	23.3	3	.9
	6 AM	165	49.3	4	1.2
	7 AM	33	9.9	16	4.8
	8 AM	12	3.6	45	13.4
	9 AM	21	6.3	59	17.6
	10 AM	26	7.8	208	62.1
Sleeping hours	Fewer than 5 hours	6	1.8	2	.6
	5 to 6 hours	70	20.9	29	8.7
	6 to 8 hours	186	55.5	163	48.7
	More than 8 hours	73	21.8	141	42.1

Age did not significantly affect the CASC scores of children (p=0.694); however, it seems that younger children had higher mean scores, indicating that younger children had more significant sleep problems. We found no significant difference between male and female children (p=0.073).

We found a significant difference between academic performance in sleep pattern scores (p=0.001), where the children with an academic level of excellent had lower CSAC scores. In comparison, a weak academic level was associated significantly with higher CSAC scores. Moreover, children with sleep problems had a 5.46-fold higher risk of difficulty studying than those who did not have sleep problems (odds ratio, 5.46; 95% confidence interval, 1.738 and 17.155; p=0.003; Table 4).

Table 4 Demographic factors including academic performance and CASC scores

		CASC Score		
		Mean	Standard Deviation	p-value
Age of child (years)	6-8	10.48	7.14	0.694
	8-10	9.78	4.82	
	11-13	9.52	4.82	
	14-17	9.00	3.63	
Gender of child	Male	10.41	5.31	0.073
	Female	9.35	5.49	
Academic level	Excellent	9.35	4.31	0.001*
	Very good	9.65	5.07	
	Good	12.39	7.09	
	Weak	15.38	14.20	
Does the child face difficulty while studying lessons and doing homework?	Always	16.14	10.46	0.00*
	Sometimes	9.77	4.76	
	Never	8.39	4.23	

Abbreviation: CASC, child and adolescent sleep checklist.

DISCUSSION

This study aimed to evaluate children's sleep habits in Saudi Arabia and explore the association between healthy sleep habits, academic performance, and social skill development. The most important finding of this study is that academic performance is significantly related to children's sleep patterns. Better academic performance was related to better sleep quality and fewer sleep problems. This finding correlates with many other studies, including one by Rasekhi *et al*., who reported that optimized sleep patterns might improve children's academic performance and learning ability [7]. Dewald *et al*. [8] and Adelantado-Renau *et al*. [9] reported a positive association between sleep quality and academic performance in adolescents. Therefore, sleep disturbance could affect learning ability and memory, which are the main factors that determine students' academic performance. Curcio *et al*.'s findings also support this [10]. However, some studies did not find a relation between academic performance and children's sleep patterns [11,12].

Of our respondents, 11.9% had sleep problems, which is lower than the incidence of sleep problems reported in other studies. One study reported that 38.9% of students had poor sleep quality using the Pittsburgh Sleep Quality Index (PSQI) [13]. A study by Rasekhi *et al*. found that 66% of students had sleep problems [8]. However, both studies were conducted in older student populations. The proportion of children with sleep problems in our study was also lower than that reported by Adelantado-Renau *et al*., who found that 35% of children (mean age, 13.9 years) had poor sleep quality according to the PSQI [9].

Among our respondents, many children had a good sleep pattern with no waking up during the night; however, most children had difficulties waking up for school. In contrast to our results, Mishra *et al*. showed that only 34.2% of children aged six to 10 have difficulty waking up for school [14]. Co-sleeping was defined as sharing the bed and the room with some other person [15]. In this study, most children slept with one or more siblings (70.4%), and only 13.8% of children slept alone, which aligns with Mishra *et al*.'s report of 67.4% of children co-sleeping [14].

Furthermore, we found a difference in sleeping patterns among children between weekend days and school days where children tend to sleep for shorter durations and wake earlier on school days, and slept for a longer time on weekend days, which agrees with Mishra *et al*.'s study [14]. Many other studies showed that children and adolescents with good grades tend to go to bed at a later time at night and wake up earlier in the morning [16-19], which suggests that school children may be sleep-deprived during school days and build significant level of sleep debt.

Gender and age were not associated with a significant impact on sleep, which is consistent with Mishra *et al*. and Gupta *et al*. [14,20]; however, other studies from Japan and Brazil reported that gender might affect sleep pattern where girls have more extended sleep latency periods than boys [21,22].

Our study had several important limitations, including a reliance on the self-reporting questionnaire, which could be a source of bias or falsifying answers to represent a healthier situation than what is otherwise true. We did not account for ways to mitigate confounding factors in our study. Our study also did not assess psychiatric symptoms related to depression, anxiety disorder, obsessive-compulsive disorder, attention deficit disorder, or neurodevelopmental disorders.

CONCLUSIONS

Sleep quality affects academic performance in children and adolescents. Increasing the awareness of the importance of sleep quality for parents, educators, and physicians is essential for optimal outcomes in children and adolescents. Further investigations regarding the effect of demographic variables on sleep patterns and behaviors and controlling for these variables should be conducted.

References

1. Lin L, Somerville G, Boursier J, Santisteban JA, Gruber R: Sleep duration is associated with academic achievement of adolescent girls in mathematics. Nat Sci Sleep. 2020, 12:173-182. 10.2147/NSS.S237267
2. Dimitriou D, Le Cornu Knight F, Milton P: The role of environmental factors on sleep patterns and school performance in adolescents. Front Psychol. 2015, 6:1717. 10.3389/fpsyg.2015.01717
3. Ahmad S, Bashir S: A pilot study investigating the association between sleep and cognitive function among adolescents. *Asian J Psychiatr*. 2017, 28:34-37. 10.1016/j.ajp.2017.03.020
4. Howie EK, Joosten J, Harris CJ, Straker LM: Associations between meeting sleep, physical activity or screen time behaviour guidelines and academic performance in Australian school children. BMC Public Health. 2020, 20:520. 10.1186/s12889-020-08620-w
5. Buragadda S, Melam GR, Alhusaini AA, Perumal V, Mavilla V: Effect of sleep problems on academic grade among school children in Saudi Arabia. *Sci Fed J Insomnia*. 2018, 2:1-8.
6. Oka Y, Horiuchi F, Tanigawa T, *et al*.: Development of a new sleep screening questionnaire: Child and Adolescent Sleep Checklist (CASC). Japanese J Sleep Med. 2009, 3:404-8.
7. Rasekhi S, Pour Ashouri F, Pirouzan A: Effects of sleep quality on the academic performance of undergraduate medical students. Health Scope. 2016, 5:e31641. 10.17795/jhealthscope-31641
8. Dewald JF, Meijer AM, Oort FJ, Kerkhof GA, Bögels SM: The influence of sleep quality, sleep duration and sleepiness on school performance in children and adolescents: A meta-analytic review. Sleep Med Rev. 2010, 14:179-189. 10.1016/j.smrv.2009.10.004
9. Adelantado-Renau M, Diez-Fernandez A, Beltran-Valls MR, Soriano-Maldonado A, Moliner-Urdiales D: The effect of sleep quality on academic performance is mediated by Internet use time: DADOS study. *J Pediatr (Rio J)*. 2019, 95:410-418. 10.1016/j.jped.2018.03.006
10. Curcio G, Ferrara M, De Gennaro L: Sleep loss, learning capacity and academic performance. Sleep Med Rev. 2006, 10:323-337. 10.1016/j.smrv.2005.11.001
11. Sweileh WM, Ali IA, Sawalha AF, Abu-Taha AS, Zyoud SH, Al-Jabi SW: Sleep habits and sleep problems among Palestinian students. Child Adolesc Psychiatry Ment Health. 2011, 5:25. 10.1186/1753-2000-5-25
12. Kazim M, Abrar A: Sleep patterns and academic performance in students of a medical college in Pakistan. KUST Med J. 2011, 3:57–60. http://www.kmuj.kmu.edu.pk/article/view/8534
13. Medeiros AL, Mendes DB, Lima PF, Araujo JF: The relationships between sleep-wake cycle and academic performance in medical students. Bio Rhythm Res. 2001, 32:263-70. 10.1076/brhm.32.2.263.1359
14. Mishra A, Pandey RK, Minz A, Arora V: Sleeping habits among school children and their effects on sleep pattern. *J Caring Sci.* 2017, 6:315-323. 10.15171/jcs.2017.030
15. Thoman EB: Co-sleeping, an ancient practice: issues of the past and present, and possibilities for the future. Sleep Med Rev. 2006, 10:407-417. 10.1016/j.smrv.2005.12.001
16. Yang CK, Kim JK, Patel SR, Lee JH: Age-related changes in sleep/wake patterns among Korean teenagers. Pediatrics. 2005, 115:250-256. 10.1542/peds.2004-0815G
17. Iglowstein I, Jenni OG, Molinari L, Largo RH: Sleep duration from infancy to adolescence: reference values and generational trends. Pediatrics. 2003, 111:302-307. 10.1542/peds.111.2.302
18. BaHammam A, Bin Saeed A, Al-Faris E, Shaikh S: Sleep duration and its correlates in a sample of Saudi elementary school children. Singapore Med J. 2006, 47:875-881. https://pubmed.ncbi.nlm.nih.gov/16990963/
19. Kawabe K, Horiuchi F, Oka Y, Ueno SI: Association between sleep habits and problems and internet addiction in adolescents. Psychiatry Investig. 2019, 16:581-587. 10.30773/pi.2019.03.21.2
20. Gupta R, Kandpal SD, Goel D, Mittal N, Dhyani M, Mittal M: Sleep-patterns, co-sleeping and parent's perception of sleep among school children: Comparison of domicile and gender. Sleep Sci. 2016, 9:192-197. 10.1016/j.slsci.2016.07.003
21. Alexandru G, Michikazu S, Shimako H, *et al*.: Epidemiological aspects of self-reported sleep onset latency in Japanese junior high school children. J Sleep Res. 2006, 15:266-275. 10.1111/j.1365-2869.2006.00530.x
22. Natal CL, Lourenço TJ, Silva LA, Boscolo RA, Silva A, Tufik S, de Mello MT: Gender differences in the sleep habits of 11-13 year olds. Braz J Psychiatry. 2009, 31:358-361. 10.1590/s1516-44462009000400013

How to cite this article:

Sara Alharbi *et al* (2021) 'The Impact of Childhood Sleep Habits And Quality On Academic Performance', *International Journal of Current Medical and Pharmaceutical Research,* 07(04), pp 5750-5753.

****