



ORIGINAL RESEARCH PAPER

Nursing

SLEEP CHARACTERISTICS AND BODY MASS INDEX OF ADOLESCENTS

KEY WORDS: Sleep; adolescent; Body Mass Index; day time sleepiness; sleep hygiene; BMI

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ABSTRACT

Introduction: Very little studies have been conducted about the sleep among children in India and rarely among adolescents.
Objectives: The objective of the study was to assess the quality and quantity of sleep and its relationship with Body Mass Index in adolescents.
Methods: A descriptive cross sectional survey design was used. Socio personal data sheet, School Sleep Habits Survey and Adolescent sleep hygiene scale were used to collect data from 604 adolescents aged 13-15 years studying in VIII to X standards. Height and weight were measured as per standard procedures. Body Mass Index was calculated.
Results: The mean age of the sample was 13.89 years. There were 307(50.8%) girls. The overweight and obesity was 2.6% and 1.2% respectively. It was found that 98.7% of adolescents got adequate sleep of 8 to 10 hours and only 1.2% had inadequate sleep. The sleep quality of sleep in the adolescents was also good. The lowest score (3.9) was in the bed time routine factor and the highest score (6) was in the substances factor. The overall Adolescent Sleep Hygiene Scale score was 5.04 with a SD of 0.6.
Conclusion: The adolescents had good sleep characteristics, both in terms of quality and quantity. There was no correlation between BMI and sleep characteristics.

Introduction

Sleep is a universal biological feature in all species, and represents a global state of immobility with greatly reduced responsiveness to environmental stimuli, which can be distinguished from coma or anaesthesia by its rapid reversibility.¹

Adolescents need about nine hours of sleep per night, yet most teens get far less. An understanding of sleep physiology is essential which will help nurses better monitor and manage sleep deprivation in this population.²

Significant personal and public health issues, such as depression and accidental injury and mortality, are associated with insufficient sleep. Converging biological and psychosocial factors mean that adolescence is a period of heightened risk.³

A study aimed at determining the association between sleep duration and adiposity at 13 and at 17 years of age showed an effect of sleep duration in adiposity at younger ages of adolescence.⁴

A study done to compare the strength of associations between sleep duration and body mass index (BMI) in middle childhood, and early and late adolescence concluded that the association between sleep duration and BMI varies by sex and age, with stronger associations in boys and in middle childhood compared with adolescence.⁵

Very little studies have been conducted about the sleep among children in India and rarely among adolescents. The researcher intends to assess the quality and quantity of sleep and its relationship with Body Mass Index in adolescents.

Materials and Methods

A quantitative research approach with a descriptive cross sectional survey design was used. Scientific Review Committee and Ethics committee approval from Government TD Medical College, Alappuzha was obtained. Permissions were obtained District Educational Officer and the principal of the school. The setting of the study was Aravukadu High School, Punnappra, Alappuzha. Adolescents who are having any known diseases of endocrine and chromosomal origin were excluded. Socio personal data sheet, School Sleep Habits Survey and Adolescent sleep hygiene scale were used to collect data from 604 adolescents aged 13-15 years studying in VIII to X standards. Adolescents self reported to the questionnaires. The socio personal data sheet consisted of 8 questions. The School Sleep Habits Survey consisted of 22 questions pertaining to their sleep habits including the quantity of sleep in the week days and weekends. Adolescent Sleep Hygiene Scale (ASHS) is a standardized tool to assess the quality of the sleep in adolescents. There are 33 questions in 8 subscales factors- Physiological, behavioural arousal, cognitive/ emotional, sleep

environment, sleep stability, daytime sleep, substances and bed time routine. A score of 6 is the highest and higher score represents better success in each dimension of sleep hygiene. It took about 40 minutes to complete the three questionnaires. Height and weight were measured by using a stadiometer to the nearest 0.5 kg/cms as per standard procedures. Body Mass Index was calculated. Both descriptive (frequencies and percentages) and inferential statistics (Spearman's correlation co-efficient and chi square) were used.

Results

The mean age of the sample was 13.89 years with a standard deviation of 0.79 years. There were 307(50.8%) girls. The percentage distribution of adolescents from Standards VIII, IX and X was 37.59, 36.09 and 26.32% respectively. Regarding the educational level of parents 68% of mothers and 28.1% of fathers had completed Standard XII. It was found that 45.5% of mothers were home makers and 91.6% of fathers were earning daily wages. Nearly 60% of adolescents were obtaining B&B+ as the highest grade in their studies.

Table 1 Frequency distribution and percentage of adolescents based on age in years

Age in years	f	%
13	228	37.7
14	213	35.3
15	163	27

From Table 1 it is clear that 37.7% of adolescents were 13 years of age.

The Body Mass Index was calculated. The age and sex specific percentiles of BMI according to the Centers for Disease Control are shown in figure 1. The overweight and obesity was 2.6% and 1.2% respectively.

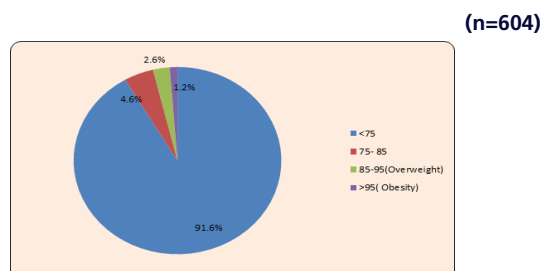


Figure 1 Percentage distribution of adolescents based on the BMI percentiles

The sleep characteristics of adolescents were assessed in terms of quantity and quality. The quantity of sleep was assessed by duration of sleep in hours in the nights during week days and weekends.

It was found that 98.7% of adolescents got adequate sleep of 8 to 10 hours and only 1.2% had inadequate sleep.

Table 2 Mean and Standard deviation of duration of sleep of adolescents in weekdays and weekends

(n=604)

Time of the week	Mean	SD
Week days	8.67	0.7
Weekends	8.92	0.8

From table 2 it is seen that the mean duration of sleep among adolescents during week days was 8.67 hours and during weekends was 8.92 hours. It was also found that 46.4% of adolescents reported that they experienced 2 or 3 awakenings at night while 23.7% had no such awakenings. Nearly half (48.5%) of the adolescents self reported that they were good sleepers. A quarter (23.4%) of the adolescents reported that they always got enough sleep and 61.9% got enough sleep sometimes only. None reported that they never got enough sleep.

The sleep quality was assessed by Adolescent Sleep Hygiene Scale. The highest score of 6 suggested better success on the overall sleep and on each dimension of sleep.

Table 3 Mean and SD of the Adolescent Sleep Hygiene Scale and its subscales

(n=604)

Subscale factors of ASHS	Minimum	Maximum	Mean	SD
Physiological	2.4	6	4.5	1.01
Behavioral arousal	2	6	4.09	1.4
Cognitive/ emotional	4.6	6	5.7	0.4
Sleep environment	3.6	6	5.7	0.4
Sleep stability	2.6	6	5.1	0.7
Daytime sleep	3.5	6	5.5	0.7
Substances	6	6	6	0
Bed time routine	1	6	3.9	2.04
Total ASHS score	4.19	6	5.04	0.6

It is seen from Table 3 that the lowest score (3.9) was in the bed time routine factor and the highest score (6) was in the substances factor. The overall ASHS score was 5.04 with a SD of 0.6.

The Pearson's correlation coefficient was computed to determine the correlation between BMI and Sleep characteristics and is shown in Table 4.

Table 4 Mean, SD and r showing the correlation between BMI and sleep characteristics

(n=604)

	Mean	SD	r
Sleep duration in hours	8.67	0.7	-0.06
BMI	16.9	3	
Sleep hygiene	5.04	0.6	-0.05
BMI	16.9	3	

Not significant

From the table 4 it is clear that there is a weak negative correlation which was not statistically significant between sleep characteristics and BMI among adolescents.

Discussion

In the present study overweight and obesity was 2.6% and 1.2% respectively. In another study conducted among low income group in Kochi, Kerala was 2.5% and 1.5% respectively.⁶ The school selected for the study had children from low income group. Nearly half of the adolescents reported that they were good sleepers and 98.7% of adolescents had adequate sleep (8-10 hours). A contrary finding was seen in a study done among 8th and 10th graders which showed that 37.2% had sleep problems.⁷

Present study found that the score for physiological factor subscale of ASHS was 4.5 and for emotional factor were 5.7. The overall ASHS score was 5.04 with a SD of 0.6. An experimental study to improve sleep- Sleep smart intervention program- improved the physiological and emotional subscale scores among 7th graders.⁸

The present study found that there was a negative correlation which was not statistically significant between sleep characteristics and BMI (r= -0.06 and - 0.05). Another study also found a linear relationship with highest BMI associated with shortest sleepers and lowest BMI associated with longest sleepers among adolescents.⁹ This was a similar study finding.

Conclusion

Sleep is a biological need. Adolescents may be deprived of sleep due to academic pressure, social media, peer pressure etc. But the study concluded that sleep characteristics- quantity and quality- were better in the adolescents aged 13 to 15 years. There was no significant correlation between sleep characteristics and BMI. School health nurses should conduct sleep surveillance among adolescents to detect sleep problems and institute suitable programs. Inadequate sleep can adversely affect the health and academic performance of the adolescents.

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