

## Sleep Disorder among Adolescents in Ajman, UAE

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### ABSTRACT

**Objectives:** The study aimed to determine the prevalence of sleep disorders, factors affecting sleep disorders and prevalence of different types of sleep disorders among adolescents.

**Methods:** A cross sectional study was carried out in 324 students of grade 10,11,12. The inclusion criteria include both male and female in the age group 15-18 years of any nationality. Ethical consent was obtained from parents. A validated questionnaire was given to find out the presence of sleep problems and associated factors.

**Results:** According to our study from a total of 324, 138 (43%) participants reported to have perceived sleep problems. Sleep disorder was most prevalent among females (65.4%). 65.5% of the participants with sleep disorder had a positive family history of sleep problems. Among 131 participants with perceived sleep problems, 95 (72.5%) had sleep problems according to Pittsburgh global score. Among 183 participants who said not to have sleep problems, 103 (56.3%) had sleep problems. 68.5% of the participants had poor sleep quality. Sleep latency was prevalent for 55.8%. 22.5% of the participants had Short sleep duration. 53.4% of the participants had poor sleep efficiency. Sleep disturbance was prevalent for 91.3% of the participants. Only 9.6% use sleep medications. 56.8% of the participants had daytime dysfunction. The prevalence of Obstructive Sleep Apnea, Insomnia and Restless Leg Syndrome was 8.9%, 34% and 55.6% respectively. Males had higher prevalence of Obstructive sleep apnea and Insomnia (11.1% and 42.6%) and prevalence for Restless Leg Syndrome was similar in both males and females (55.6%).

**Conclusion:** Out of 312, 199 (63.2%) participants had prevalence of sleep problem according to Pittsburgh global score for sleep problem. Age and Grade were the significant factors that affect participants sleep problem. Among 131 participants with perceived sleep problems 95 (72.5%) had sleep problems. Among 183 participants who said not to have sleep problems, 103 (56.3%) had sleep problems. Insomnia and Restless Leg Syndrome was more common disorders among the participants. Younger age adolescents have 70% higher risk for having sleep problem than older age adolescents for having sleep problem (Odds ratio=1.673). Adolescents in grade 10 and 11 have 70% higher risk for sleep problems than those who are in higher grade (Odds ratio=1.675).

**Keywords:** Pittsburgh sleep quality index; Parasomnia; Insomnia; Hyper somnolence

### INTRODUCTION

Sleep is essential for proper functioning of the physical, biological and mental health. It is a natural phenomenon of body and mind characterized by decreased metabolic rate, altered consciousness, relaxation and restoration of tissues and muscles. "Internal biological clock" and "Sleep wake homeostat" work together to regulate the body to stay awake during day time and sleep during night under normal conditions [1,2].

Continuous disturbance in the sleep wake rhythm will cause

disorders like Delayed Sleep Phase Syndrome, Advanced Sleep Wake Phase Disorder, Irregular Sleep Phase Disorder etc [3].

Lack of proper sleep among adolescents who delay their sleep for 2 to 3 hours will have a "sleep debt" which leads to excessive daytime sleepiness [4].

For adolescents, 8 hours of sleep is necessary to process new information. When students sleep less than 8 hours, they will miss last 2 hours of REM sleep which is essential for the formation of newly learned information's [5,6].

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According to International classification of sleep disorders, sleep disorders are classified into seven. They are Insomnia, Sleep-related breathing disorders, central disorders of hypersomnolence, circadian rhythm sleep wake disorder, Sleep related movement disorders, parasomnia, and other sleep disorders [3].

Among these the most common sleep disorders seen in adolescents are Insomnia, sleep related breathing disorders, Central disorders of hypersomnolence, Sleep related Movement disorder [7,8].

### Rationale

Sleep disorder is a common bothering issue among adolescents [9]. The reasons include stress, use of electronic gadgets, drug intake, smoking, poor sleeping environment etc.

According to medical researches, lack of proper sleep affects the academic performance of adolescents and they are more likely to struggle in schools, leading to affecting learning ability, memory, concentration and moreover motivation of the students. Also, chronic sleep deprivation could lead to serious conditions like depression [10].

Previous studies show that chronic sleep deprivation affects people's health very badly. Very few numbers of published articles are available regarding this important issue that can affect achievement and health of students [11]. Thus, this study is beneficial for the parents as they can be more concerned about the sleeping patterns of their children.

As the adolescence is an individual's growing period, it is necessary to find out the problems related to sleep and related health issues as earlier as possible in order to provide information for both the adolescents and parents. Thus, a thorough understanding of these factors will help the society, to help the affected adolescents adopt a better strategy to adhere to the preventive measures.

### Objectives of our study

- To assess the Prevalence of sleep disorder among adolescents in Ajman, UAE.
- To determine the prevalence of different types of sleep disorder among adolescents in Ajman, UAE.

## MATERIALS AND METHODS

### Research design

A Cross sectional study was adopted.

### Study population

This study was conducted among Secondary school students in Al Ameer English School and British international School, Ajman, UAE.

### Inclusion criteria and exclusion criteria

Students, both males and females in grade 10-12 those who

accepted to participate in the study and Parents (for those age less than 18 years) who approved participation of their children and signed consent form was included in the study. Students in the identified school other than grade 10-12 and students who refused to participate or those whose parents refused to sign inform consent were excluded from the study.

### Sampling strategy

Convenient sampling.

### Sample size calculation

For calculation of sample size, the prevalence of sleep disorder among adolescents in North America [7] was used with the aid of the following equation.

$$N = Z^2 pq / 0.05^2$$

$$= (1.96)^2 \times 0.25 \times 0.75 / 0.05^2$$

$$= 3.841 \times 0.25 \times 0.75 / 0.0025 = 288.12$$

Probability of refusal to participate will be 10%.

i.e., 29% = 317.12 = 320

The required sample size is minimum 320.

### Study settings and duration of study

We did our study among students in grade 10, 11 and 12 in Al Ameer English School, Ajman and British International School, Ajman, UAE.

The research was conducted over a period of 9 months.

### Variables

Dependent variables-Sleep disorder

Independent variables-Age, Gender, Grade, BMI, Family history, Medications to sleep.

### Study instrument

After reading different articles and literature reviews related to the topic, a self-administered questionnaire was made.

### The Pittsburgh Sleep Quality Index

The Pittsburgh Sleep Quality Index (PSQI) provides a standardized measure of sleep quality and the factors that influence quality. It provides a reliable, valid, and standardized measure of sleep quality. To score the questionnaire, each of the individual questions is assigned a score from 0-3. The item scores are used in computing the seven component scores, which are then added to produce a global score. The global score can range from 0 to 21. Any total score obtained that is greater than 5 is suggestive of a significant sleeping disorder.

Unlike the overall score, there are no reported "cut off" scores for the seven components.

### Validation procedure tool

The draft questionnaire was content validated by one psychiatrist and one psychologist.

### Pilot study

The tool was pilot tested among five students from the target population to check the feasibility, time taken to fill the questionnaire and to check for the clarity of questionnaire.

### Methodology

Approval for data collection was taken from principals of both schools. After getting approval from the ethics committee and approval from principals of both schools, the research team communicated with the school principals for data collection. Informed consent was handed to the students to give to their parents for getting parent approval. Students whose parents approved for participation was approached and asked to fill the questionnaire. Research team was available at the time of data collection to clarify the doubts and make sure that all questions are filled completely by the students.

### Ethical issues

The proposal was approved by the IRB of Gulf Medical University.

The participants were fully informed about the purpose of this research. The participants had the chance to participate voluntarily and signed consent was obtained from their parents before enrolment of participants. The informed consents included information about the objectives of the study, information obtained from the participants and the risks. Copy of the inform consent was handed to the participants after filling the questionnaire. Participants were ensured that all information provided by them was kept confidential in the Department of Community Medicine. Data was analyzed in groups. Only researchers and members of Ethics Committee may have access to this data according to the research policy of Gulf Medical University. This research will not cause any risk or physical, psychological or social distress to the participants and this research does not involve administration of any drug, food or placebo to the participants.

### Data analysis

After data collection the data was entered in an Excel spread sheet and analyzed using SPSS version 24, descriptive statistics and inferential statistics was performed. The results were expressed in frequency and percentages. Association between dependent and independent variables was tested by Chi square test. Simple and multiple logistic regression analysis were done for factors that were significantly associated with sleep problem.

## RESULTS

### Distribution of sleep problems by duration of having sleep problem

72 (53.3%) reported that they had sleep problems since less than or equal to 6 months whereas 22 (16.3%) of them had sleep problems since more than 12 months (Figure 1).

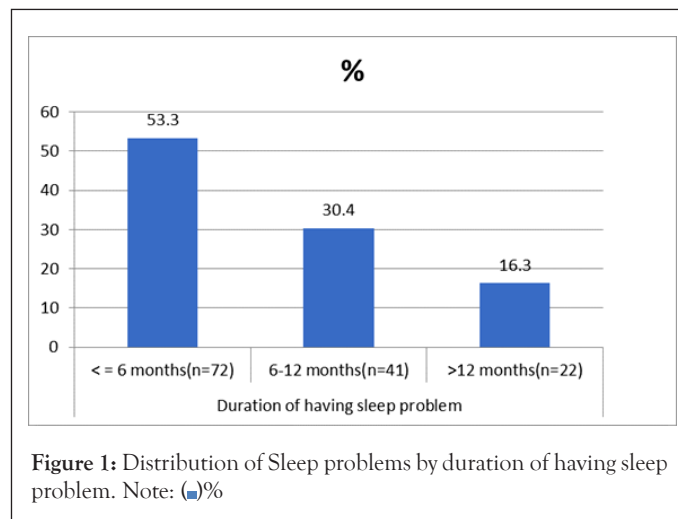


Figure 1: Distribution of Sleep problems by duration of having sleep problem. Note: (■)%

### Prevalence of perceived sleep problem

In comparison with perceived sleep problem of participants with Pittsburgh global score for sleep problem, among 131 participants with perceived sleep problems 95(72.5%) had sleep problems.

Among 183 participants who said not to have sleep problems, 103(56.3%) had sleep problems according to global PSQI score.

There is significantly higher association between perceived sleep problem and Pittsburgh global score for sleep problem (Figure 2 and Tables 1 and 2).

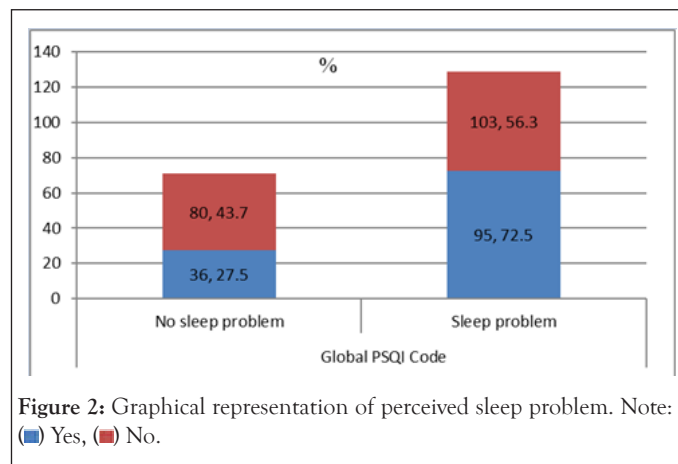


Figure 2: Graphical representation of perceived sleep problem. Note: (■) Yes, (■) No.

**Table 1:** Prevalence of perceived sleep problem.

Variable	Sub category	Global PSQI Code				P value
		No sleep problem		Sleep problem		
		No:	%	No:	%	
Sleep problem	Yes	36	27.5	95	72.5	0.004
	No	80	43.7	103	56.3	

**Table 2:** Prevalence of Pittsburgh sleep quality index components.

Pittsburgh sleep quality index components	Yes		No	
	n	%	n	%
Poor sleep quality	222	68.5	102	31.5
High sleep latency	179	55.8	142	43.8
Inadequate sleep duration	251	77.5	73	22.5
Poor sleep efficiency	171	53.4	149	46.6
Sleep disturbance	294	91.3	28	8.7
Use of Sleep medication	31	9.6	291	90.4
Daytime dysfunction	183	56.8	139	43.2

## DISCUSSION

### Perceived sleep problem

In comparison with perceived sleep problem of participants with Pittsburgh global score for sleep problem, our study showed that among 131 participants with perceived sleep problems 95 (72.5%) had sleep problems. Among 183 participants who said not to have sleep problems, 103 (56.3%) had sleep problems according to global PSQI score. There was significantly higher association between perceived sleep problem and Pittsburgh global score for sleep problem. In a study conducted by Ipsiroglu Et al among 832 adolescents, 12% of the children reported sleep problems every night, 76% reported occasional sleep problems, and 12% had no sleep problems [12].

### Prevalence of sleep components

In our study, 31.5% of adolescents have symptoms related to poor sleep quality, whereas, 68.5% adolescents have history of good sleep quality. But comparatively in another study, 45.5% adolescents are poor sleepers and 79.6% adolescents are good sleepers [13]. In our study, 55.8% of adolescents have history related to sleep latency and 44.2% of adolescents do not have any related symptoms to sleep latency. But comparatively in another

study shows that 22.8% of adolescents had abnormal sleep onset latency (<5 minutes and >30 minutes) [11]. In our study, the 22.5% of adolescents have less amount of sleep duration, whereas 77.5% adolescents who have enough amount of sleep duration during week day. In another study, its shows that, the mean duration of night sleep of the subjects in the study was 7.84 (1.9) hours during weekday [11]. In our study, 46.6% of adolescents have symptoms related to poor sleep efficiency, compared to ones who have good sleep efficiency with 52.8%. In other study, which shows that Mean sleep efficiency during weekdays was 85%, with girls (84%) having lower sleep efficiency than boys (87%) [14]. In our study, 294(91.3%) adolescents who face symptoms which is related to sleep disturbance, whereas only 28(8.7%) of adolescents have no history of sleep disturbance. Comparatively in another study, it shows that 39.6% of the total sample had symptoms related to sleep disturbance [15]. In our study, 9.6% adolescents take medications for sleep, whereas compared to 9.6% who don't take medications for sleep. In another study among adolescents, where only 2.3% of the sample had ever taken hypnotic medications for sleep related problems [15]. In our study, almost 56.8% of adolescents have symptoms of daytime dysfunction, in comparison to 43.2% without any symptoms of daytime dysfunction. In another study, which shows that, 14.4% have daytime dysfunctions like increase chance of falling asleep while sitting and reading, whereas 7.4% have chance of falling asleep while sitting and talking to someone, and also 2.7% of them have chance of sleeping while driving [16].

### Prevalence of Pittsburgh global scores for sleep problem

In our study, 199(63.2%) no. of students show the prevalence of sleep problem according to Pittsburgh global score, whereas, 116(36.8%) of them don't have sleep problem. Similar to our study, a study done among adolescents of age 15-17 reported that 61.5% of the participants had sleep problem [11]. Our study showed that Among 131 students with perceived sleep problems, according to global Pittsburgh score, 95(72.5%) had sleep problems. And among 183 students who said not to have sleep problems, 103(56.3%) had sleep problems according to global PSQI score. There is significantly higher association between perceived sleep problem and Pittsburgh global score for sleep problem. In a study conducted by Ipsiroglu Et al among 832 adolescents, 12% of the children reported sleep problems every night, 76% reported occasional sleep problems, and 12% had no sleep problems [15].

### Prevalence of disorders

In our study, 8.9% of adolescents had history of symptoms related to Obstructive sleep apnea, whereas 91.1% doesn't have any history of symptoms related to it. But comparatively in another study it shows that, the prevalence of Obstructive sleep apnea which is diagnosed by varying criteria on diagnostic studies ranges from 0.1 and 13% [11]. In our study, it shows that, 33.6% of adolescents have symptoms related to insomnia, whereas 66.4% of adolescents have no history of related symptoms



to insomnia. But in other study, the prevalence of insomnia among the adolescents was 10.7% [17-19]. In our study, 55.6% of adolescents face symptoms of restless leg syndrome, whereas 44.4% don't face any symptoms related to restless leg syndrome. But in another study, it shows that the prevalence of RLS was 8.4% among Adolescents and Young Adults [15].

## CONCLUSION

- Presence of perceived sleep problem-43%
- Obstructive sleep apnea symptoms-8.9%
- Higher prevalence among male participants (11.1%)
- Highest among participants in grade 11 with 12.5% and those who were underweight (14.3%)
- 13% participants had positive family history of sleep problems
- Manifestations of Insomnia-34%
- Males had higher prevalence with 42.6%.
- Participants of age 17 and in grade 11 had higher prevalence.
- 40% of the participants with malnutrition had symptoms of insomnia.
- 40.7% participants with symptoms of insomnia had a positive family.
- Symptoms of Restless Leg Syndrome-55.6%
- Males and females had equal prevalence.
- Participants of age 15 and those who were in grade 10 had greater prevalence.
- 75% of the participants with malnutrition had symptoms of restless leg syndrome and 40.7% of participants with family history of sleep problems.
- Prevalence of perceived sleep problem with Pittsburgh global score for sleep problem-among 131 participants with perceived sleep problems 95 (72.5%) had sleep problems. Among 183 participants who said not to have sleep problems, 103 (56.3%) had sleep problems.
- Prevalence of Pittsburgh sleep components
- 68.5% had symptoms related to poor sleep quality.
- Sleep latency was prevalent for 55.8%.
- 22.5% of the participants had Short sleep duration.
- 53.4% of the participants had poor sleep efficiency.
- Sleep disturbance was prevalent for 91.3% of the participants.
- Only 9.6% use sleep medications.
- 56.8% of the participants had daytime dysfunction.
- 63.2% of the participants had prevalence of sleep problem according to Pittsburgh global score.

Higher prevalence for females-65.4%.

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