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## RESEARCH ARTICLE

# A STUDY TO ASSESS ABNORMAL SLEEP PATTERN AND ITS EFFECT ON HEALTH AMONG ADOLESCENTS

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**ABSTRACT**

**Background of Study:** Adolescence is the most important period in one's life. It is the period of stress and strain, of day dreams, of intense affection and excitement. Sleep is a primary aspect of adolescent's development. The way adolescents sleep critically influence their ability to think, behave and feel during day time hours.

**Objective:** To assess the abnormal sleep pattern among adolescents. To assess the effect of abnormal sleep pattern on health of adolescents. To find out the relationship of abnormal sleep pattern among adolescents with selected demographic variables-Age, Gender, Class, Birth order, Type of family, Family income, Use of internet and Time spent on watching television.

**Design and Methods:** A Quantitative approach and Descriptive research design was used to assess abnormal sleep pattern and its effect on health among adolescents. The target population of study was adolescents studying in 9th to 12th standard in BCM Senior Secondary School, Ludhiana, Punjab. Sample of 500 adolescents were chosen by stratified random sampling technique. Data was collected by Pittsburgh sleep quality index to assess abnormal sleep pattern and PGI health questionnaire to assess effect of abnormal sleep pattern on health. Data collection was done in February, 2014.

**Results:** Results of the study revealed that 33% of adolescents had abnormal sleep pattern, out of those maximum (36.97%) adolescents had very adversely affected health, followed by (35.15%) normal health and least (27.88%) had adversely affected health. A positive correlation (0.348) was found between abnormal sleep pattern and adversely affected health at $p<0.01$. The findings showed that demographic variables such as Gender (3.47, $p < 0.01$), Standard of study (2.97,$p< 0.05$), Family income (3.37, $p<0.05$), Use of internet (4.38,$p< 0.01$) and Time spend on watching television (2.70, $p<0.05$) had significant impact on abnormal sleep pattern among adolescents. The investigator prepared and distributed the pamphlets regarding good sleep pattern to promote healthy sleep pattern among adolescents.



## INTRODUCTION

Sleep is not only a biological necessity but also a physiological drive. In today's fast-paced world, a good night sleep is often the first thing to go. The effects of inadequate sleep are more than mere annoyances: that affect our mood and how we perform at school, work, and home and behind the wheel. Lost sleep also accumulates over time; the more "sleep debt" an individual incurs, the greater are negative consequences, according to researchers in the field. (Wolfson and Carskadon 2006) Adolescence is the most important period in one's life. It is the period of stress and strain, of day dreams, of intense affection and excitement. Adolescence is a time of important physical, cognitive, emotional and social change when the behaviours in ones developmental stage are constantly challenged by new abilities, insights and expectations of the next stage. Sleep is a primary aspect of adolescent development. The way adolescents sleep critically influences their ability to think, behave and feel during day time hours. Likewise, day time activities, changes in environment and individual factors can have significant effects on adolescent's sleeping patterns. (Epstein *et al.,* 1998) During adolescence (13–22 years of age), many changes occur in sleep patterns and there are many influences on sleep quality and quantity. Excessive daytime sleepiness in this population is a widespread problem and can have major negative effects on the individual's performance, health, and safety. Paediatricians and other health care professionals have an important opportunity to evaluate their adolescent patients for evidence of excessive daytime sleepiness and underlying sleep deprivation and/or sleep disorders. (Laberge *et al.,* 2001). Sleep can often be a

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barometer of your overall health. In many cases, people in good health tend to sleep well, whereas those suffering from repeated sleeping problems might have an underlying medical or mental health problem, be it minor or serious. Sleeping well is essential to your physical health and emotional well-being. Unfortunately, even minimal sleep loss can take a toll on your mood, energy, efficiency, and ability to handle stress. Ignoring sleep problems and disorders can lead to poor health, accidents, impaired job performance, and relationship stress. If you want to feel your best, stay healthy and perform up to your potential, sleep is a necessity, not a luxury. (Choi *et al.,* 2009)

**Aim of the study**

The aim of study was to assess the abnormal sleep pattern with a view to provide pamphlets regarding good sleep pattern to the adolescents.

## MATERIALS AND METHODS

A Quantitative research approach and Non-experimental descriptive research design was used in this study. The target population of the study was the adolescents studying in 9th to 12th class in BCM Senior Secondary School, Shastri Nagar, Ludhiana, Punjab. A sample of 500 adolescents, in the age group of 13 – 18 years were selected by using stratified random sampling technique.

**Hypothesis framed in this study was as follows**

**$H_1$:** There is significant adverse effect of abnormal sleep pattern on health among adolescents as measured by standardized tool at $p < 0.05$ level.

**Rationale:** Johnson H, Wiggs L (2005) conducted a cross-sectional descriptive study to assess the sleep disorders and psychological disturbance in children. They found that psychological & emotional problems (at $p <$ or $= 0.01$) were significantly higher in children with frequent sleep disturbance. (Johnson and Wiggs 2005)

**$H_0$:** There is no effect of abnormal sleep pattern on health among adolescents as measured by standardized tool at $p<0.05$ level

Two standardised tools were used for data collection.

**Tool I**

**Section 1-** Demographic characteristics

This part included 8 items to obtain information from the sample regarding Age, Gender, Class, Birth order, Type of family, Family income, Use of internet and Time spent on watching television. As this was related to demographic characteristics so it was not included in the scoring system.

**Section 2- Pittsburgh Sleep Quality Index**

This tool was used to assess abnormal sleep pattern among adolescents. Pittsburgh Sleep Quality Index was developed by Daniel J. Buysse, CF Reynolds, TH Monk, SR Berman, DJ Kupfer (1989). Permission to use this tool was taken from first author i.e. Daniel J. Buysse, M.D., Professor of Psychiatry and Clinical and Translational Science, University of Pittsburgh School of Medicine U.S.A. The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep. Tool consists of total 9 items. Item number 1-4 assessed the sleep-wake schedule and duration of sleep, 5-8 items assessed the trouble sleep and 9th item assessed the quality of sleep. Scoring of this part of tool is as follows:

Maximum score-21
Minimum score-0

| | |
|---|---|
| Component 1 | Score of 9th item ( 0-3 ) |
| Component 2 | 2nd item (≤15min=0; 16-30 min=1; 31-60 min=2, >60 min=3) + 5th (a) (if sum is equal 0=0; 1-2=1; 3-4=2; 5-6=3) |
| Component 3 | Score of 4th item (>7=0; 6-7=1; 5-6=2; <5=3) |
| Component 4 | ( total number of hours asleep)/(total number of hours in bed) x 100 (if >85%=0, 75%-84%=1, 65%-74%=2, <65%=3 ) |
| Component 5 | Sum of Scores 5b to 5j (0=0; 1-9=1; 10-18=2; 19-27=3) |
| Component 6 | Score of 6th item ( 0-3 ) |
| Component 7 | Score of 7th item + 8th item (0=0; 1-2=1; 3-4=2; 5-6=3) |

**Interpretation:** Total ≤ 5 associated with good sleep quality
Total > 5 associated with poor sleep quality

**Tool II- PGI Health Questionnaire**

This tool was used to assess the effect of abnormal sleep pattern on health. It is a standardized tool that was developed by Dr. S.K. Verma, Dr. Dwarka Pershad and Dr. N.N. Wig (1974). The tool was purchased by the researcher. This questionnaire consists of 38 items, in which 16 items were related to physical health and 22 items were related to psychological health. Each item carried one mark.

Total score- Sum of score of PartA (Physical health) and Part B (Psychological heath)
Maximum score-38
Minimum score-0
Criterion measurement is as follows:

| | |
|---|---|
| Normal health | 0 – 7 |
| Adversely affected health | 8 – 10 |
| Very adversely affected health | > 10 |

After obtaining written permission from the Ethical and Research committee of INE GTBS(C) Hospital, Ludhiana, Punjab, from Principal of BCM Senior Secondary School, Shastri Nagar, Ludhiana, Punjab, and verbal consent from the study subjects, data was collected in the month of February, 2014 from 500 adolescents studying in 9th to 12th class in BCM Senior Secondary School, Shastri Nagar, Ludhiana. Stratified random sampling technique was used to select sample. Selected adolescents were gathered in a classroom. Purpose of the study was explained to the adolescents and verbal consent was taken from study subjects. Pittsburgh sleep quality index was distributed to the adolescents and they were asked to complete the tool. After assessing the abnormal sleep pattern, adolescents having abnormal sleep pattern were asked to complete PGI Health Questionnaire. Average time taken by each student was 15 minutes for each tool. The data collected was analysed by using descriptive and inferential statistics i.e. mean, mean percentage, standard deviation, Karl Pearson' coefficient of correlation , 't' test, 'Z' test, 'F' test and Tukey's

HSD test. 't' test was calculated to find out the significance of coefficient of correlation (r).

## RESULTS

The analysis of data was done in accordance with objectives of the study. The data was organized and presented under the following sections:

**Section I:** Demographic characteristics of sample.
**Section II:** Finding related to frequency and percentage distribution of adolescents according to sleep pattern.
**Section III:** Findings related to effect of abnormal sleep pattern on health among adolescents.
**Section IV:** Findings related to relationship of abnormal sleep pattern among adolescents with selected demographic variables.

**Table 1. Frequency and percentage distribution of sleep pattern among adolescents**

N=500

| Sleep pattern | | Adolescents | |
|---|---|---|---|
| | Score | n | % |
| Normal | < 5 | 335 | 67 |
| Abnormal | ≥ 5 | 165 | 33 |

Maximum score = 21
Minimum score = 0

Table 1 depict the frequency and percentage distribution of adolescents according to sleep pattern. This table reveals that maximum (67%) adolescents had normal sleep pattern and remaining adolescents had abnormal sleep pattern (33%).

**Table 2. Frequency and Percentage distribution of health status among adolescents with abnormal sleep pattern**

N=165

| Health Status | | Adolescents | |
|---|---|---|---|
| | Score | n | % |
| Normal | ≤ 7 | 58 | 35.15 |
| Adversely affected | 8 -10 | 46 | 27.88 |
| Very adversely affected | > 10 | 61 | 36.97 |

Maximum score = 38
Minimum score = 0

Table 2 depicts the frequency and percentage distribution of adolescents according to health status. This table reveals that maximum (36.97%) adolescents had very adversely affected health, followed by normal health (35.15%) and least (27.88%) of adolescents had adversely affected health. It was concluded that majority of the adolescents had very adversely affected health.

**Table 3. Relationship between abnormal sleep pattern and health among adolescents**

N=165

| Relationship | | | Adolescents | | |
|---|---|---|---|---|---|
| Between | Mean | SD | r | df | t |
| Abnormal sleep pattern | 7.25 | 1.69 | | | |
| & | | | 0.348 | 163 | 4.739** |
| Health | 10.06 | 4.97 | | | |

Maximum sleep pattern score = 21
Minimum sleep pattern score = 0
Maximum health score= 38
Minimum health score= 0

**=Significant at p<0.01 level

Table 3 depicts the relationship between abnormal sleep pattern and health among adolescents. This table reveals that mean score of abnormal sleep pattern among adolescents was 7.25 and mean score of health among adolescents was 10.06. Based on Karl Pearson's correlation coefficient, relationship between abnormal sleep pattern and adversely affected health was found to be weak positive correlation i.e. 0.348. According to paired 't' test, the relationship between abnormal sleep pattern and adversely affected health was found statistically significant at p<0.01 level. Thus it was inferred that abnormal sleep pattern among adolescents adversely affect their health. Thus research hypothesis was accepted and null hypothesis was rejected.

## DISCUSSION

Based upon findings from analysis of data and review of literature discussion was done according to the objectives:

The analysis of the data regarding first objective revealed that maximum (67%) adolescents had normal sleep pattern and minimum (33%) adolescents had abnormal sleep pattern. Whereas Wang Gauang Hai *et al.* (2013) conducted a study to assess the prevalence of sleep pattern & sleep disturbances and its associated factors among Chinese school-aged children. A sample of 912 children (6–14 years) was recruited. The study findings suggested that 69.3% children suffered from global sleep disturbances (CSHQ total score >41) and that was more than normal sleep pattern. The findings regarding second objective revealed that maximum (36.97%) adolescents had very adversely affected health, followed by normal health (35.15%) & least (27.88%) adolescents had adversely affected health and there was weak positive correlation (0.348, significant at p > 0.01) between abnormal sleep pattern and adversely affected health. These findings were supported by study done by Sunil D.C. Meera K. Pillai (2012) who reported that the subject experiencing physical difficulties had highest (21.21%) score, followed by psychological difficulties (19.48%) and social difficulties had the least (12.86%) score. Finding of the study showed that majority of subjects suffered from sleepiness and there was positive correlation of sleep disorder with physical difficulties (r = 0.189, at p < 0.05 level) and psychological difficulties(r = 0.094, NS at p < 0.05 level).

The findings according to third objective of the study revealed the relationship of abnormal sleep pattern among adolescents with selected demographic variables.

Findings according to the age revealed that it had no impact on abnormal sleep pattern among adolescents. Whereas Wong Willium and Ortiz Christina *et al.* (2013) conducted a cross-sectional study to assess sleep duration of underserved minority children, reported that there was significant relationship between abnormal sleep pattern and age at $p < 0.03$ level. Findings according to the gender revealed that it had impact on abnormal sleep pattern among adolescents. Whereas Shur-Fen Gau Susan (2006) conducted a study to assess the prevalence of sleep problems and their association with inattention/hyperactivity among children in Taiwan. A sample of 2463 ($1^{st}$ to $9^{th}$ grade) was recruited using a multistage sampling method. The instruments included the Sleep Habits Questionnaire & Chinese Health Questionnaire and the Chinese versions of the Conners' Parent and Teacher Rating Scales. Sex and age were controlled in the model. Study results showed no gender differences in terms of sleep problems, sleep schedules and daytime napping, with the exceptions that 5th ($p= 0.014$) and 7th grade boys ($p = 0.007$) were more likely than girls to snore during sleep and 9th grade girls were more likely than boys to have nightmares ($p = 0.001$). Findings according to the class revealed that it had impact on abnormal sleep pattern among adolescents. This finding wsa supported by Wang Gauang Hai *et al.* (2013) conducted a study to assess prevalence of sleep patterns & sleep disturbances and its associated factors among Chinese school-aged children. The study findings reported that sleep disturbances are associated with school grade ($\beta = -0.09$, $p < 0.05$). Findings according to the birth order revealed that birth order had no impact on abnormal sleep pattern among adolescents. Findings according to the type of family revealed that it had no impact on abnormal sleep pattern among adolescents. Findings according to the family income revealed that it had impact on abnormal sleep pattern among adolescents. This finding was supported by Moore Melisa, Kirchner H Lester *et al.* (2011) conducted a study on adolescent sleep time & variability in sleep time, demonstrated that abnormal sleep pattern is significantly associated with parent income ($r=-.19$, $p<.005$).

Findings according to the use of internet revealed that it had impact on abnormal sleep pattern among adolescents. Findings according to the time spend on watching television revealed that it had impact on abnormal sleep pattern. On the contrary Sunil D.C. Meera K. Pillai (2012) reported that time spend on watching television ( $\chi^2 = 3.639$, non significant at $p < 0.05$ level) had no impact on abnormal sleep pattern.

**Conclusion**

- Maximum (67%) adolescents had normal sleep pattern.
- Maximum (36.97%) adolescents with abnormal sleep pattern had very adversely affected health.
- There was weak positive correlation (0.348) between abnormal sleep pattern and adversely affected health.
- Gender, Class, Family income, Use of internet and Time spend on watching television had significant impact on abnormal sleep pattern among adolescents.

**Recommendation**

Health Awareness Programmes must be conducted in schools to educate children and adolescents regarding health, its dimensions, their importance in our lives and benefits of healthy health habits.

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