

Sleep Pattern and Academic Achievement: A Comparative Analysis of High and Low Academic Achievers

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Abstract

Sleep is an important activity which plays a vital role in the physiological and psychological health of the individuals. Lack of sleep is associated with different health problems such as hypersensitivity, diabetes, obesity, attention, concentration and memory problems. Majority students do not give importance to their sleep and mostly remain awake for whole night or late night. Present study was designed to explore the relationship of sleep with the academic achievement of students. The sample (n=120) of the study was consist of male and female college students. The age range of the participants was 16-18 years. Information about the sleep pattern of the participants was taken through a self-report sleep pattern inventory and their academic achievement was determined from their mark sheets. On the basis of the earned grades they were divided into two groups' i.e. high academic achievers and low academic achievers and their scores on the sleep pattern inventory were analyzed. Measure of mean differences or t-tests were used to compare the sleep pattern of the high and low academic achievers. Results have shown significant differences in the sleep pattern of the high and low academic achiever participants. High achievers were found to have more adequate sleep pattern (sleep of 6-8 hours per night) as compared to low academic achievers who had sleep duration of less than 4 hours. Findings of the present study indicated that awareness must be given to students for maintaining an adequate sleep pattern through organized study schedule for better achievement.

Keywords: Sleep pattern, academic achievement, high achievers, low achievers

1. Introduction

Sleep is an important activity which significantly affects both the physiological functions as well as the psychological health of individuals. Findings of several physiological studies (Curcio, Ferrara & De Gennaro, 2006; Simpson & Dinges, 2007; Stickgold, 2005) had revealed that lack of sleep linked with obesity, diabetes mellitus, hypertension, cardiovascular disease, weak immunity and stroke. On the other hand, adequate sleep is positively correlated with the memory, attention, learning and problem solving skills of individuals (Lack, 1986; Stickgold, 2005). Many individuals especially youngsters and students give least importance to the sleep (Carskadon, Harvey & Dement, 1981). They try to meet the deadlines of completing assignments and other academic work by compromising their sleep which is not a healthy attitude because lack of night sleep alters the attention capacity of individuals (Drummond & McKenna, 2009; Wolfson & Carskadon, 2003). Some other factors like internet surfing, talking on cell phones, computers, video games etc. are also responsible for their late night sleep or lack of sleep. There are three main types of sleep patterns; long sleep (9 or more hours sleep), average sleep (7-8 hours) and short sleep (4 hours or less sleep). Generally, night sleep of seven to eight hours has been indicated by the health professionals as important for good mental and physiological health (Carskadon,

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Harvey & Dement, 1981; Heuer & Klein, 2003; Hackethal, 2013). Different studies (Heuer, Spijkers, Kiesswetter, & Schmidtke, 1998; Kahn, Van de Merckt, Rebuffat, 1989; Simpson & Dinges, 2007) had indicated that reduction of night time sleep due to reduced or altered sleep patterns is associated with the excessive sleepiness during day time and impaired school or college performance. In poor sleepers (4 or < 4 hrs. sleep), risk of failing is double than the normal sleepers (7-8 hrs. sleep). Pilcher & Huffcut (1996) conducted a study to find out the relationship of the sleep deprivation with the academic achievement of the undergraduate students. Findings of the study revealed that long term and short term sleep deprivation is positively related with the attention difficulties and interest level of students. While partial sleep deprivation has significant association with the mood swings of individuals. Different physiological studies have indicated clearly that adequate sleep pattern (6-8 hours sleep) is important for the consolidation of memory which has important implication for the academic success of students. Fredriksen, Rhodes, Reddy, and Way (2004) conducted a longitudinal study of the effects of adolescent sleep loss during middle school. Findings indicated a direct relationship of sleep loss with more depressive symptoms, lower self-esteem, and lower academic achievement. Undoubtedly there are several factors associated with the academic achievement of the students but sleep is the significant one which was taken least seriously by the students as well as their parents and teachers. Thus the objective of the present study was to explore the relationship of sleep pattern (hours of sleep taken by an individual) with the academic achievement of the students. Findings of the study would be beneficial for the parents and teachers to guide the students for taking suitable sleep during night for better concentration during study hours in day time. It would be informative for the students to understand the relationship of the sleep pattern with the memory, concentration and academic achievement.

2. Research Questions

Following research questions were raised to meet the objectives of the study and hypotheses were generated on the basis of these questions.

1. Is there any significant relationship between adequate sleep pattern and academic achievement of students?
2. Is there any significant difference in the sleep pattern of high and low academic achievers?
3. Does inadequate sleep pattern significantly affect academic performance?
4. Are there any gender differences in the sleep pattern of the high and low academic achievers?

3. Hypotheses

Following hypotheses were formulated for the present study;

- (1) There would be significant differences in the sleep pattern of the high and low academic achievers.
- (2) High academic achievers would have more adequate sleep than the low academic achievers.
- (3) There would be non-significant gender differences in the sleep pattern of the male and female high and low academic achievers.

4. Methodology

4.1: Sample

The sample (n=120) of the present study was comprised of college students. The age range of the participants was 17-19 years (Mean age=18.23, SD=10.72). Sample was collected through purposive random sampling from three different male and female colleges

of Hyderabad. Purposive sampling technique was used because data was collected only from the high and low academic achievers. Low academic achievers were those students who had secured less than fifty five percent marks ($< 55\%$) in the first year class and high achievers were those who had secured more than seventy percent marks ($> 70\%$) in the first year. Academic achievement was assessed from the mark sheets of first year issued by the Board of intermediate and secondary education, Hyderabad (BISE, Hyd.) for the authentication of the results. Mark sheets of the participants were collected before the administration of the questionnaire. There were sixty ($n=60$; males=30, females=30) high achiever participants and sixty ($n=60$, males=30, females=30) were low academic achievers. The sample size ($n=120$; high achievers =60, low achievers = 60) is relatively small in terms of gender (Male high achievers/low achievers=30, Female high achievers/low achievers= 30) because the main focus of this article is on analyzing the relationship of the sleep pattern with the academic achievement of the participants.

4.2: Measures

Two instruments were used to collect the data. These were (a) Sleep pattern inventory and (b) Personal information form.

(a) Sleep pattern inventory (SPI)

Sleep pattern inventory was used to measure the sleep pattern of the participants. It is a self-report inventory and comprised of fourteen items having response category of five point Likert-like scales ranging from “Almost always” to “Almost never”. Score of five was assigned to almost always and one to almost never. Some items were scored in reverse direction to avoid response set bias. High score on the inventory shows the adequate sleep pattern (7-8 hours sleep), and low score indicates poor or inadequate sleep pattern (less than 4 hours sleep). The reliability coefficient $r = 0.78$ indicates that it is a reliable instrument to measure the sleep pattern.

(b) Personal information form

It was used to gather the background characteristics of the participants such as age, gender, education, having personal cell phones, laptop, social status, grade or marks in first year, education of father and mother etc.

4.3: Procedure

First of all permission was taken from the principals of the colleges to collect the data. Then rapport was developed and informed consent was taken from the participants. The academic record of the participants was gathered from the administration office of the college. Afterwards instructions were given to the participants that they have to answer every statement. There is no right and wrong answer of any statement. Personal information questionnaire was filled up before sleep pattern inventory. Participants were encouraged to ask any question if they have about any statement.

5. Analysis of Results

For the analysis of the results t-tests were computed. Table -1 is presenting the descriptive statistics and t-test of the scores of the high and low academic achievers on the sleep pattern inventory.

Table-1

t-value, mean and standard deviation of the scores of the high ($n=60$) and low ($n=60$) academic achiever participants on the sleep pattern inventory

Scale	High Achvrs($n=60$)		Low Achvrs ($n=60$)		t-value
	Mean	SD	Mean	SD	
Adequate sleep	33.57	13.36	13.18	14.25	5.46***
inadequate sleep	12.70	10.42	35.44	9.31	4.12**

df=118, *** $p < .001$, ** $p < .01$

Table -1 is indicating significant mean differences among the scores of the high and low academic achievers on the sleep pattern inventory. Results are indicating that high academic achievers have adequate sleep pattern as compared to low achievers. The mean value (Mean= 33.57, SD=13.36) of the high achiever participants is greater than the mean value of the low academic achievers (Mean=13.18, SD= 14.25) on adequate sleep pattern which indicates that high achievers take adequate sleep than the low achievers. Thus hypotheses one and two are confirmed.

Table-2

t-values of the scores of the male (n= 30) and female (n= 30) high academic achiever participants on the sleep pattern inventory

Scale	Male H. Achvrs		Female H. Achvrs		t-value
	Mean	SD	Mean	SD	
Adequate Sleep	28.11	9.21	31.24	10.80	1.02
inadequate sleep	13.27	12.51	8.26	11.16	0.07

Table-3

t-values of the scores of male (n= 30) and female (n= 30) low academic achiever participants on the sleep pattern inventory

Scale	Male low Achvrs		Female low Achvrs		t-value
	Mean	SD	Mean	SD	
Adequate sleep	16.82	16.50	14.05	10.79	1.61
Inadequate sleep	22.15	13.26	25.13	11.02	0.96

Analysis of results in table 2 and 3 are indicating non-significant gender differences in the sleep pattern of the high and low academic achievers. Thus hypothesis three is verified.

7. Discussion

Analysis of data on sleep patterns and academic achievement among high and low academic achieves has indicated that those youngsters who take adequate night sleep (h.achvr mean = 33.57, low achvrs mean = 13.58; t-value= 5.46, $p < .001$) have better academic achievement level as compared to those who have inadequate night sleep patterns. These findings are consistent with the previous study conducted by Williams and Aderanti (2014). The positive relationship of reduced night time sleep and low academic performance has also been confirmed in the present study as low academic achievers have shown inadequate sleep pattern as compared to high academic achiever participants (low achvrs mean= 35.44, h.achvrs mean = 12.70, t-value= 4.12). Night sleep of seven to eight hours is important for the active and alert mind during daytime. Whereas disturbed night sleep alters the attention and concentration abilities of students during studies thus cause problems in learning. Therefore it is significantly important for the students to follow a schedule and be organized to complete their academic tasks within proper time limit. They should not compromise on the night sleep to gain adequate physical and psychological rhythm for proper functioning and effective learning. The unhealthy life style of late night sleep and late wake-up on weekend among adolescents or children should be prohibited firmly by parents and must guide their children about the importance of proper night sleep. The findings support the viewpoint that insufficient sleep patterns not only affect the mental and physical health of the students but their achievement level too.

8. Conclusion

It is concluded in the light of the analysis of the present study that adequate night sleep (7-8 hrs) is directly related with the academic achievement of the students. It significantly affects attention and alertness of the students during daytime. Generally students do not give importance to the night sleep they sleep late night and also wake-up lately which is not beneficial for them because it is associated with the low academic achievement. Proper sleep at night enhances concentration, learning abilities and cognitive functioning of the individuals. Thus it is important for students to remember that early to bed and early to rise will really make them healthy physically as well as psychologically beside improving their learning abilities and achievement.

Recommendations and Suggestions

In the light of the findings of the present study it is suggested that;

- Parents and teachers must guide students about the importance of night sleep and its relationship with the attention and memory span etc.
- Students should be advised to follow an organized schedule for studying and completing academic tasks to take their night sleep adequately.
- Parents should try firmly that their children follow a healthy life style (early to bed and early to rise) which will not only be helpful to solve learning problems and increase in academic achievements but will also improve their psycho-physiological health effectively.

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