



THE EFFECT OF SLEEP LENGTH ON ACADEMIC PERFORMANCE OF STUDENTS

Vinayak Sawant, Assistant Professor, Department of humanities and applied sciences, Atharva College of Engineering, Malad.

Shreepad Prabhu, Assistant Professor, Department of Mathematics, S.R.M. College, Kudal.

Deepika Panchal, Assistant Professor, Department of humanities and applied sciences, Atharva College of Engineering, Malad.

Priyanka Malgaonkar, Assistant Professor, Department of humanities and applied sciences, Atharva College of Engineering, Malad.

ABSTRACT:

Overall longer duration of sleep correlated with better grades. Factors such as sleep, stress, family background etc. makes an effect on academic performance of students. Sleep deprivation impairs learning processes and memory consolidation. Sleep habits and academic performance are correlated. Sleep length and SGPA are dependent.

Key Words: *Sleep length , SGPA, Chi- Square Test, d.f. (degrees of freedom)*

INTRODUCTION:

Sleep loss is one of the most striking problems of modern society [1]. Very often, to cope with so many things to do every day, we prefer to give up some sleep in the hope that doing so won't cause harm and will allow us to do more things. The aim of this study is to focus on the effect of sleep length on academic performance of the students. Under this study we have considered the hypothesis that, "There exists a relationship between Sleep Length and SGPA of students". This hypothesis is tested using **Chi-square** test [2] and Data is analyzed using pie-chart.

HYPOTHESIS

There exists a relationship between Sleep Length and SGPA of students.

AIM & OBJECTIVES

To test the effect of Sleep Length on the SGPA of college students. To check suitability of Standard Sleep Time for students as advised by National Sleep Foundation.

METHODOLOGY

Data Collection:

- 1) Sample survey through Google forms.

Data Analysis:

- 1) Chi-square Test [2].
- 2) Pie-Diagram.

DATA- ANALYSIS

TABLE: OBSERVED FREQUENCIES

	SGPA			Total
		Less than 6	Between 6 to 10	
Sleep Length	Less than 6	435	53	488
	6-8	134	335	469
	More than 8	40	9	49



	Total	609	397	1006
--	--------------	-----	-----	------

TABLE: EXPECTED FREQUENCIES

		SGPA		
		Less than 6	Between 6 to 10	Total
Sleep Length	Less than 6	295.4	192.6	488
	6-8	283.9	185.1	469
	More than 8	29.7	19.3	49
	Total	609	397	1006

TESTING OF HYPOTHESIS

H_0 : Sleep Length and SGPA are Independent.

H_1 : Sleep Length and SGPA are dependent.

O - Observed frequencies

E - Expected frequencies

$$\chi^2_{Cal} = \sum \frac{(O - E)^2}{E}$$

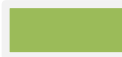
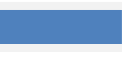



O	E	$\frac{(O - E)^2}{E}$
435	295.4	65.97211
134	283.9	79.14762
40	29.7	3.572054
53	192.6	101.1846
335	185.1	121.3939
9	19.3	5.496891

d.f.(Degrees of freedom)= 2


$$\chi^2_{Cal} = 376.7672$$

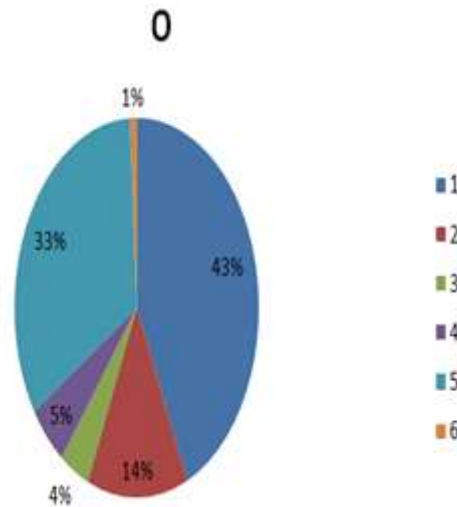
$$\chi^2_{0.01} = 9.215$$

$$\chi^2_{0.05} = 5.991$$

	Sleep Length (In Hrs.)	SGPA
	More than 8	Less Than 6
	Less Than 6	Less Than 6
	6-8	Less Than 6
	More than 8	6-10
	Less Than 6	6-10



	6-8	6-10
---	-----	------



RESULTS

1. Since calculated value of $\chi^2_{cal} = 376.7672$ is much greater than the table value of $\chi^2_{0.01} = 9.215$ for 1% level of significance and $\chi^2_{0.05} = 5.991$ for 5% level of significance, null hypothesis H_0 is rejected.
2. Pie chart indicates that ,
 - i) 43% students sleep for less than 6 hours and their SGPA is less than 6.
 - ii) 33% students follow the standard rest period(6-8 hrs) and have SGPA greater than 6.

CONCLUSIONS

The Data analysis shows that:

- 1) Sleep habits and academic performance are correlated.
- 2) Sleep length and SGPA are dependent.
- 3) Students who follow the standard rest period (6-8hrs) have better SGPA.

References:

- [1] Giuseppe Curcio, Michele Ferrara, Luigi De Gennaro, *Sleep Loss, Learning Capacity, and Academic Performance*, Elsevier, *Sleep Medicine Reviews* (2006) 10, 323–337.
- [2] S. C .Gupta, *Fundamentals of Statistics*, Himalaya Publishing House.
- [3] Glyn Davis, Branko Pecar, *Business Statistics using Excel*, Oxford University Press.
- [4] P. N. Arora , *Biostatistics*, Himalaya Publishing House.