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Relationship between sleep quality and academic motivation among college students

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Abstract

This study aimed to explore the relationship between sleep quality and academic motivation among college students, focusing on gender difference. The aim to understand the relationship between sleep quality and academic motivation. A sample of 200 college students from Bangalore, including 86 males and 114 females, was collected using convenience sampling method. The data were analysis using correlation coefficient and t test. The results revealed no significant relationship between sleep quality and academic motivation overall, but a significant association with a- motivation. An independent sample t test further indicated a significant difference in the level of sleep quality between male and female participant indicating that male generally experiences better sleep quality compared to female. Mann Whitney t test for academic motivation between males and female's participant. It's a no significant difference accepts the null hypothesis. This study provides insight into the role of sleep in academic motivation.

Keywords: Sleep Quality; Academic Motivation; Self-determination theory; Maslow's hierarchy theory

1. Introduction

1.1. Sleep quality

Sleep is at the very center of student overall health and well-being. It is a multifaceted physiological state common to man and most animals, a prerequisite for mental sharpness, emotional balance, and physical well-being. Sleep quality is measured by subjective and objective measures that reflect its restorative, effective, and satisfactory aspects. It is required in learning, memory, and cognitive functioning, enabling the acquisition of knowledge and stress reduction. Aside from that, sleep strengthens the immune system, balances metabolism, and aids in tissue repair and growth. Sleep hormone modulation affects energy, hunger, and reproductive function (Jain,2024)

Correct sleep is vital for brain performance, enabling attention, memory processing, and problem-solving capacity. Sleep hygiene disorders compromise attention span, academic functioning, social life, and health. Excessive daytime sleepiness disrupts academic achievement and causes distress in health (Tanuj Maithani et al., 2024). Poor sleep quality has been attributed to negative feelings, fewer positive feelings, and higher perceived stress (Niloufar A. et al., 2022). Sleep disorders are very common among university students and often culminate in sleep difficulty and with mental health. The World Health Organization estimates that depression will become the most common cause of disability globally by 2030. It has been shown that people who have normal sleeping patterns are less prone to stress and insomnia as they have better coping skills to handle stress (Yiwen Wang et al., 2024).

Excessive use of smartphone, especially during the night, is among the significant risk factors for sleep disorders that have a negative impact on sleep quality (Zhe Zhao et al., 2023). Sleep deprivation will tend to result in withdrawal from society, indicating the relationship between sleep quality and social support. Alcoholism, smoking, physical inactivity,

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and excessive internet use are all etiologic of sleep disorder. Sleep disorders commonly accompany medical and mental illness (Shu Hui et al., 2011). Normal sleep is important to good health and well-being (Sanja Manchevska et al., 2024).

1.2. Academic Motivation

Motivation has a major function to perform all through the process of learning, driving behavior in direction of predetermined ends. Motivation encourages learning, social effectiveness, persistence, performance quality, and self-discipline (Shashi Singh et al., 2011). Internalized and self-regulated school activities directed toward the realization of academic targets, as claimed by Pintrich and Zusho (2002), are academic motivation. It is also further classified into intrinsic motivation (working for learning since it is rewarding to oneself), extrinsic motivation (working for learning to receive external rewards), and amotivation (lack of motivation) (Shaljan Areepattamannil, 2011).

Intrinsic motivation leads one to learn because they want to, a location of intellectual interest and wonder. Extrinsic motivation relies on external rewards like praise and grades, which can create short-term interest but don't create full enthusiasm for the course (Legault, 2016; Disha, 2021). Successful study skills are time management, organization, active learning, setting goals, and metacognition. Constant high study skills build knowledge, increase study time, and reduce academic tension.

1.3. Theoretical framework

Sleep quality is the evaluation of the quality of how people sleep and generally includes sleep duration,sleep onset,sleep maintenance and sleep disorders. Quality sleep improves relaxation and refreshment states many studies affirm improve our ability to think. Academic motivation includes the internal and external factors of a child's motivation to succeed in education and academic processes but this includes goal setting, self-motivational correlates and commitment to the goal.

1.3.1. Self-determination theory (SDT)

Self-Determination Theory explains human motivation in terms of three universal psychological needs: autonomy, competence, and relatedness. Self-Determination Theory addresses intrinsic motivation and basic psychological needs that affect well-being and social behavior. Motivation is affected by external and internal factors, and the quality of sleep may affect cognitive and affective processes and thereby indirectly affect intrinsic motivation.

Competence is the ability to execute tasks and acquire skills effectively. Relatedness refers to the belongingness and affinity with others. Autonomy represents self-motivation and direction. When human needs are satisfied, individuals prosper, maximizing personal development and motivation.

1.3.2. Maslow's hierarchy theory

According to the theory put forth by Maslow, all the fundamental psychological needs like but not limited to sleep, have to be fulfilled first, before fulfilling more complicated needs such as self-actualization. According to Maslow, there are five prevailing stages which constitute the hierarchy of needs that include, self-actualization, self-esteem, love and belonging, safety and security and physiological needs. The initial human need is always the need to exist physically and that is what will motivate our behavior the most because the human body cannot function properly without fulfilling physical needs. Precisely, physical needs are breathing, eating, drinking, having a roof over one's head, dressing, keeping warm, having sex and sleeping. Of all these, sleep is most stressed in our life thus he takes it as the first priority in the order. Insomnia, however, can make a person too drowsy, irritable, fidgety and even cause their physical well-being and mental health to suffer, thus interfering with a student's ability to concentrate on his/her studies. Those who are unable to achieve the barest minimum of adequate sleep also end up facing problems in pursuing self-realizing pursuits offered by bourgeois society to all activities towards becoming a genuine individual, such as adequate education, self-realization, and self-engagement. In fact, suboptimal sleep may hinder academic achievement because it precludes accomplishment of higher order that fuels scholarly pursuit from being realized.

1.3.3. Adaptive theory

Also known as evolutionary theory of sleep or theory of inactivity. This is one of the earliest theories which also explain this activity of sleeping. proposes that sleeping is something that improves our chances of survival in the long run. This theory describes sleep as a function developed over the course of evolution to protect some species from activity during dangerous times, i. e., at night, when certain predator species are resting but remain very active and have excellent vision. Drowsiness, like hunger and thirst, is a cue that indicates a basic need necessary for survival and health.

1.3.4. Self-Regulation Theory

Self-regulation is the power to regulate thoughts, emotions, and conduct so that they create some effects. Quality sleep diminishes self-regulation and makes it less effective with increased impulsivity, procrastination, and goal-setting difficulty. Sleep also is very comparable to mood regulation, and better emotional regulation and stress management are observed after a good night's sleep. Sleep deprivation causes irritability, mood lability, and hyper-responsiveness and thus generates destructive effects on interpersonal relationships and learning.

Rest is also essential in recovery from mental functioning. Lack of rest diminishes the brain's capacity to self-regulate and leads to poor judgment, lack of concentration, and heightened emotional sensitivity. It is important in intricate higher mental functioning such as attention, decision-making, and control of impulses. Sleep loss over a long period result in a self-reinforcing cycle, amplifying self-regulatory and goal-blocking impairment.

1.3.5. Cognitive Load theory

Cognitive Load Theory, in its general nature, rests on the constraints of working memory and the impact of cognitive load on the efficacy of learning. This theory holds that cognitive resources are finite. Cognitive load is enhanced by poor sleep as it damages cognitive processes, with less being available for learning and academic performance, thus reducing motivation. Poor sleep has been found to enhance cognitive load by weakening cognitive processes like attention, memory consolidation, and executive functioning.

1.4. Aims and Objective of the Study

To study the relationship between sleep quality and Academic motivation among college students.

- To study the correlation between sleep quality and Academic motivation among college students.
- To examine the significant difference in sleep quality between male and female.
- To study the significant difference in academic motivation between male and female.

1.4.1. Research Hypotheses

- H_o1: There will be no relationship between sleep quality and academic motivation
- H_o2: There will be no difference in sleep quality between male and female.
- H_o3: There will be no significant difference academic motivation between male and female.

1.5. Significance of the Study

The significance of this study lies in its exploration of the relationship between sleep quality and academic motivation among college students. Understanding this connection can help educators and health professionals develop targeted interventions to improve students' academic performance and overall well-being. By addressing sleep issues, the study aims to enhance students' motivation, reduce stress, and promote a healthier, more productive learning environment.

2. Material and Methods

2.1. Research design

The study will follow a correlation research design in-order to explore and analyze that was correlation between sleep quality and academic motivation among college students.

2.2. Participants

The sample for the study consists of 200 college students aged between 18 and 25 years. The participants are evenly divided by gender, with females and males included in the sample.

2.3. Technique Used

The study will utilize convenience sampling to efficiently collect data from participants. This method is chosen for its speed and ease of implementation. By focusing on readily available participants, the study aims to gather information quickly. While this approach may limit generalization, it allows for timely data collection.

2.4. Inclusion criteria

- Participants should be aged 18 to 25 years
- All participants should be currently enrolled and actively pursuing their studies.
- Participants must be currently residing in Bangalore

2.5. Exclusion criteria

Those who are under medication for any illness.

2.6. Tools

2.6.1. Sleep quality scale (SQS)

The Korean Sleep Quality Scale (SQS) was constructed by Yi et al. The SQS contains twenty-eight questions divided into six sleep quality domains; sleep related daytime symptoms, restoration after sleep, sleep onset and maintenance, waking up from sleep and sleep satisfaction. In addition, where it had to be combined in one assessment tool, a general efficient measure that is reliable for the evaluation of sleep quality across different patients and research populations was Adverse Scale Towards Sleep (ASTS). Scoring Performing on a four-point, Likert type scale respectively the respondents demonstrate the frequency within which they perform those sleep behaviors (0 = "few," 1 = "sometimes," 2 = "often," and 3 = "almost always" Reliability and validity: An initial psychometric evaluation by Yi and colleagues found the Sleep Quality Scale (SQS) to possess very strong internal consistence with Cronbach's alpha standing at . 92 and test retest reliability standing at . 81 meaning that it is very reliable.

The SQS proved to be valid for the intended construct since it correlated well with the Pittsburgh Sleep Quality Index and showed significantly high scores in the insomnia sample when compared with healthy control subjects. The test-retest reliability value measured using Cronbach alpha was 0. 849. A content validity coefficient was calculated and found to be 0. 976.

2.7. Academic motivation scale (AMS)

The Academic Motivation Scale (AMS) developed by Robert Vallerand and others during the early 1990s is a 28-item self-report scale used to assess students' academic motivation. It is very reliable, with Cronbach's alpha = 0. 81 and test-retest = 0. 79 after one month.

Academic motivation of students is evaluated on a 7-point Likert scale, where 1 is 'Does not correspond at all', 4 is 'Corresponds moderately' and 7 is 'Corresponds exactly'. Each subscale is scored separately and mean score (1-7) indicates the level of motivation in that dimension with higher score indicating higher motivation in that particular dimension. Among them: SAM – Intrinsic Motivation - To Know (items 2, 9, 16, 23), SAM – Intrinsic Motivation – Towards Accomplishment (items 6, 13, 20, 27), SAM – Intrinsic Motivation – To Experience Stimulation (items 4, 11, 18, 25), SAM – Extrinsic Motivation – Identified (3, 10, 17, 24), SAM – Extrinsic Motivation – Interjected (7, 14, 21, 28), SAM - Extrinsic Motivation – External Regulation (items 1, 8, 15, 22) and Amotivation (items 5, 12, 19, 26) scores. Higher scores in each dimension signify a higher level of motivation in that dimension. (Ravneen Kaur Jolly1 et al, 2024)

2.8. Procedure

The survey will be distributed online via a Google Forms link, ensuring that it is easily accessible to college students. Clear instructions will be provided at the beginning of the survey, highlighting the importance of honest and accurate responses. The survey will include standardized questionnaires designed to measure sleep quality and academic motivation, ensuring that the data collected is consistent and reliable for analyzing the relationship between these two variables.

2.9. Data Analysis

Basen on non-normality of the data,the data will be analyzed by using spearman correlation coefficient used jamovi software. To explore how sleep quality relates to academic motivation, the spearman correlation coefficient was used. This analysis was conducted with Jamovi software, which helps in examining these relationships. A t-test was also performed to check for any differences in sleep quality and academic motivation between different genders.

3. Results and Discussion

This section provides an in-depth analysis of the data set, offering a detailed presentation of the study's findings and their respective interpretations. The hypothesis is assessed using appropriate statistical methods, including Mean, Standard Deviation, correlation analysis and t-test for gender difference.

Table 1 Mean, standard deviation, and shapiro wilk p value for sleep quality, intrinsic motivation, extrinsic motivation and amotivation

	Sleep quality	**Intrinsic motivation**	**Extrinsic motivation**	**Amotivation**
N	200	200	200	200
Mean	42. 5	4. 24	4. 45	3. 87
Standard deviation	9. 84	0. 969	1. 07	1. 16
Shapiro-Wilk p	0. 359	0. 011	0. 002	0. 059

The above table 1 shows the sample size as N=200. The mean and standard deviation for sleep quality,Intrinsic motivation,extrinsic motivation and amotivation,are found to be 42. 5,4. 24,4. 45,3. 87 and 9. 84,0. 969,1. 07 and 1. 16. for the normality,the shapiro-wilk p values are found to be 0. 359,0. 011,0. 002 and 0. 059,which is interpreted to be a normally distributed data for sleep quality and amotivation is not normally distributed data for intrinsic and extrinsic motivation. Hence the further testing of hypothesis is done using the non-parametric test of correlation called as spearman's correlation coefficient.

Table 2 The correlation coefficient between sleep quality and intrinsic,extrinsic and Amotivation.

		SLEEP QUALITY
INTRINSIC MOTIVATION	Spearman's rho	0. 073
	df	198
	p-value	0. 302
EXTRINSIC MOTIVATION	Spearman's rho	0. 133
	df	198
	p-value	0. 060
AMOTIVATION	Spearman's rho	0. 243
	df	198
	p-value	< . 001

* p < . 05, **** p < . 01,*** *** p < . 001

$H_0$1: There will be no relationship between sleep quality and academic motivation

Table 2 shows the supearman's correlation coefficient predicting the relationship between sleep quality and intrinsic,extrinsic and amotivation.

The analysis shows that there is no significant relationship between sleep quality and intrinsic motivation (Spearman's rho = 0. 073, p = 0. 302) or extrinsic motivation (Spearman's rho = 0. 133, p = 0. 060), as the p-values are above 0. 05. However, a moderate positive correlation is found between amotivation and sleep quality (Spearman's rho = 0. 243, p < 0. 001), indicating that higher amotivation is significantly associated with poorer sleep quality. Between sleep quality and intrinsic motivation and extrinsic motivation shows weak positive correlation,its not statistically significant. we cannot reject the null hypothesis,meaning there is no significant relationship between sleep quality and intrinsic motivation and extrinsic motivation.

Table 3 t-test sleep quality and gender difference, statistic, df and p value.

		Statistic	df	p
SLEEP QUALITY	Student's t	-2. 27	198	0. 024

Note. H_a $\mu_1 \neq \mu$

	Group	N	Mean	Median	SD	SE
SLEEP QUALITY	Female	114	41. 2	40. 5	10. 1	0. 947
	Male	86	44. 3	44. 0	9. 23	0. 995

$H_0$2: There will be no gender differences in sleep quality.

The table 3 present the independent t test results of gender difference in sleep quality among college students. This outcome indicates that there is a statistically significant difference in sleep quality between the two groups being compared, as the p-value (0. 024) is below the conventional alpha level of 0. 05. Group female has 114 participants with an average sleep quality score of 41. 2, while Group male has 86 participants with a higher average score of 44. 3, indicating that male generally experiences better sleep quality compared to female.

Table 4 t-test of Academic motivation among college student based on gender.

Independent Samples T-Test					
		Statistic	**df**		**p**
Motivation	Student's t	0. 908	[a]	198	0. 365
	Mann-Whitney U	4608			0. 468
Note. H_a μ 1 ≠ μ 2					

[a] Levene's test is significant (p < . 05), suggesting a violation of the assumption of equal variances

	Group	N	Mean	Median	SD	SE
Motivation	Female	114	4. 32	4. 23	0. 959	0. 0899
	Male	86	4. 21	4. 11	0. 697	0. 0751

$H_0$3: There will be no gender differences in Academic motivation.

The table 3 present the man whitney t test results of gender difference in academic motivation among college students. The p -value of. 365(p>0. 05) which indicates that there is no statistically significant difference in motivation between the two groups being compared. we fail to reject the null hypothesis (H_0).

4. Discussion

The aim of the study was to find the relationship between sleep quality and academic motivation among college students who are currently pursuing college. The sample for the study consists of 200 college students aged between 18 and 25 years. . A total of 200 participants in which 86 males and 114 females participated in the study and were included for the analysis.

The first hypothesis proposed that there is no relationship between sleep quality and academic motivation among college students. The analysis shows that there is no significant relationship between sleep quality and intrinsic motivation (Spearman's rho = 0. 073, p = 0. 302) or extrinsic motivation (Spearman's rho = 0. 133, p = 0. 060), as the p-values are above 0. 05. However, a moderate positive correlation is found between amotivation and sleep quality (Spearman's rho = 0. 243, p < 0. 001), indicating that higher amotivation is significantly associated with poorer sleep quality. The positive correlation is linked to be consistent with the results shown by Onder et al, (2014), the result was that relationship between circadian preferences, sleep quality, sleep patterns, personality traits, academic motivation and academic achievement among university students. found higher academic achievement and better sleep quality

than evening types. positive relationship between sleep quality and academic motivation because the factors that contribute to good sleep such as regular sleep schedules. lower neuroticism, conscientiousness, proper management of social jetlag also support higher academic motivation.

The study was 'how sleep quality moderates the effect of extrinsic rewards on the learning motivation. The results also suggested that students sleep quality moderates the effect of grades on students' extrinsic motivation. Well related sleep patterns improve cognitive function, emotional stability and energy level, all of which enhance a student's ability to focus, engage with academic tasks, and maintain motivation. better sleep quality support improved academic motivation, and students who are more motivated academically tend to adopt healthier sleep practices, creating a positive between the two variables also (Önder et al., 2014)

The second hypothesis proposed that there would be no significant difference in sleep quality between male and female participants. However,the results of the independent t-test, as presented in Table 3,the analysis indicate a significant difference in the level of sleep quality between male and female participants. Group 1 has 114 participants with an average sleep quality score of 41. 2, while Group 2 has 86 participants with a higher average score of 44. 3, indicating that Group 2 generally experiences better sleep quality compared to Group 1. 'The sound of gupta et al, (2021) the null hypothesis (Ho2) regarding sleep quality differences between males and females is rejected. The independent t-test shows that female participants tend to take longer to fall asleep and exhibit poorer overall sleep quality compared to male. Due to factors like stress, hormonal changes and social responsibility.

The result of the present study is found to align with the existing literature, notably in a study conducted by Tang et al., (2017), with 26851 participants, found an overall insomnia prevalence of 26. 6%. The study used the PSQI and revealed that females reported slightly higher PSQI scores (4. 32)than males (4. 21). individual rural ares had a higher PSQI score (4. 45) compared to urban residents (4. 18). the factors associated with insomnia included female gender, old age, higher education, being unmarried, cigarette smoking and alcohol consumption.

Supported study for significant difference sleep quality between male and female. The study was conducted sleep quality in the general population. Collected German community sample comprising 9284 adult resident (age 18-80years) was surveyed using PSQI and several other questionnaires. Females reported significantly more sleep problems than males.

The third hypothesis proposed that there would be no significant difference in academic motivation between male and female participants. The table 4, the analysis indicates a not significant difference in the level of academic motivation between male and female participant. . The p -value of . 365(p>0. 05) which indicates that there is no statistically significant difference in motivation between the two groups being compared. we fail to reject the null hypothesis (H_0). The one of the studies positively involving 160 college students found gender differences in academic motivation. Female adolescents exhibited higher intrinsic (M=60. 7)and extrinsic (M=63. 9)compared to males (M=55. 7) for intrinsic and (M=56. 3 for extrinsic), males showed higher level of a-motivation (M=15. 4) than females (M=10). (Tang et al., 2017)

5. Conclusion

This study delved into the intricate relationship between sleep quality and academic motivation among college students. Firstly, it was observed that no significance relationship between sleep quality and intrinsic and extrinsic motivation, but a significant association with amotivation. An independent t test revealed significant difference in the level of sleep quality between male and female participants. Male generally experiences better sleep quality compared to female. there is no significant difference between male and female in academic motivation.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

Ethical considerations were rigorously adhered to in this study. Participants provided online informed consent before their involvement, ensuring they were aware of the study's purpose, procedures, and their voluntary participation rights. Additionally, stringent measures were in place to safeguard participants' privacy and confidentiality. All data

collected were de-identified and securely stored, protecting participants' sensitive information throughout the study. These ethical practices maintained the research's integrity and respected participants' rights and well-being.

Statement of informed consent

Participants provided online informed consent before their involvement, ensuring they were aware of the study's purpose, procedures, and their voluntary participation rights.

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