ISSN: 2584-0142
PSYCHOPEDIA JOURNALS
International Journal of Interdisciplinary Approaches in Psychology (IJIAP)

A Study of the Influence of Sleep Quality on Memory among Young Adults

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Abstract: Sleep is an essential and inevitable phenomenon in human life. It plays a vital role in our day-to-day functioning. Sleep is an important biological function that enables the body to recharge, repair tissues, and regulate vital physiological processes. Its quality improves brain functions like memory, mood, attention etc. and helps to form long-term memories. Memory is a major cognitive process by which information is encoded, stored, and retrieved. Memory helps in learning, problem-solving, and decision-making. Good sleep quality enhances mindfulness and contributes to better working memory. Furthermore, there is a significant relationship between memory performance and sleep quality. The purpose of the current study was to examine the relationship between sleep quality, memory failures and memory control. A sample of 50 students, aged 18–25 years, was selected. Standardized psychological scales were administered to measure the impact of sleep quality on memory failures and memory control. The results revealed that the relationship between sleep quality and memory control was not significantly positive. Similarly, the relationship between memory failures and memory control was negative but non-significant. These findings suggest that, in this sample, variations in sleep quality and memory failures do not strongly predict levels of memory control. However, further research with larger and more diverse samples may provide a greater clarity of these relationships.

Keywords: *Sleep Quality, Memory Failures, Memory Control, Young Adults*

1. Introduction

"Sorrow can be alleviated by good sleep"

– St. Thomas Aquinas

In today's fast-paced world, young adults often find their sleep schedules under constant pressure, as social media, late-night assignments and part-time jobs blur the line between day and night. Irregular sleep patterns have become a silent crisis, leaving many feelings perpetually tired and mentally drained. The pressure to stay productive clashes with the body's natural rhythms, resulting in restless nights, difficulty concentrating during lectures, and a growing sense of fatigue that seeps into day-to-day functions of life. Recent research increasingly points to the long-term consequences of disrupted sleep, linking it to anxiety, depression, and weakened cognitive performance, making the management of sleep a critical yet overlooked aspect of young adulthood.

Good sleep quality is essential for the overall functioning of a human being. One of the factors related to sleep quality is, of course, memory. Murre et al. (2012) did research on the effect of self-reported habitual sleep quality and sleep length on autobiographical memory. The study was examined using an Internet-based diary technique. A sample of 600 participants were taken and were contacted after a retention interval that ranged from 2 to 46 days. The study was scored and measured with the Pittsburgh Sleep Quality Index. The results revealed that poor sleep quality was associated with significantly lower recall at the longer retention periods (30–46 days), but not at the shorter ones (2–15 days).

Li et al. (2021) did a research study on the impact of habitual use of smartphones on sleep quality and memory. The study sampled 2,298 Chinese students, aged 6–18 years old, using cluster-randomized sampling across urban and rural schools. Students showed habitual smartphone use with high self-efficacy, but low levels of addiction; boys and high school students had higher habitual use than girls and younger students. Smartphone use duration, frequency, and self-efficacy predicted habitual use, which in turn was linked to poorer sleep quality and impaired everyday memory. Pre-bedtime smartphone use has a negative effect on sleep quality, highlighting health and cognitive risks even without addiction.

From an article by Times of India (2023), a study investigated at the University of Otago revealed pre-bedtime habits of young people and their impact on sleep. Researchers used body cameras and food logs to study children's habits in the hour before bedtime and how these affected their sleep. They found that 99% used screens, 63% ate, and 22% exercised before bed. Screen use before bed was nearly universal, suggesting a major influence on sleep quality. Eating and exercising close to bedtime were also common, potentially disrupting restful sleep.

The purpose of this study is to explore the interrelationship between sleep quality, memory failures, and memory control. By exploring evidence from existing literature and

current research, it aims to offer the significance of sleep and inform strategies to enhance cognitive well-being and to promote a fixed sleep schedule among youth.

Sleep Quality

Nelson et al. (2022) defined sleep quality as "an evolutionary concept in which they concluded that it is an essential part of human life." Poor quality of sleep can gradually lead to poor health outcomes and various diseases. Sleep quality as a clinical construct. Poor sleep quality is a symptom of medical and many sleep disorders and has a huge impact on daytime functioning (Fabbri et al., 2021).

Mendonça et al. (2019) defined sleep quality as "a complex physiological process that is directly related to overall wellness and can reveal symptoms of several diseases." The quality of sleep plays a relevant role in the consolidation of memories and contributes to the overall development of life.

Borbély et al. (2017) defined sleep as a "natural and reversible state of reduced responsiveness to external stimuli, accompanied by a loss of consciousness." Sleep occurs in regular intervals and is homeostatically regulated, i.e., a loss or delay of sleep results in subsequently prolonged sleep.

A research study was done on college students from a university in the Eastern United States by Stiver et al. (2021). A sample of 218 students who were 18 years of age or older were taken. The aim of the study was to explore whether a person's amount of sleep and quality affect how well they learn and remember words and grasp the information visually. The research methods used were actigraphy and cognitive performance data. The study revealed that the young adults with more differences in sleep quality, which was found by the method of actigraphy, performed poorer on tasks involving visual learning and memory. Future research should explore modifiable lifestyle and environmental factors that may help improve sleep consistency.

Holcomb et al. (2016) did research to figure out the correlation between sleep quality and short-term memory. A sample of 25 young adults, 6 males and 19 females, who were 19 to 22 years old were taken. For eight hours, the participants avoided stimulants and caffeine. Participants were given two minutes to memorize a list of 30 words, followed by two minutes to recall and write down as many words as they could, which was conducted in a classroom setting. The research was based on the questionnaires Pittsburgh Sleep Quality Index (PSQI) and an independent t-test. The study found no significant difference between the sleep quality of males and females. Additionally, there was no significant difference between the number of words recalled by males and females.

Alonzo et al. (2020) did research on the interplay between social media usage, sleep quality and mental health in youth. They investigated the relationship among the young adults who were 16 to 25 years old. The inclusion criteria were met by thirty-six cross-sectional studies and six prospective cohort studies. Some studies have found that sleep quality may mediate the relationship between social media use and negative mental health outcomes in young people. The study revealed that excessive social media use is linked to poor sleep quality and adverse mental health in young people.

Memory Failures

The American Psychological Association (2018) defined memory as "the ability to retain information from the past, based on the cognitive processes of retention, learning across a given period of time or reactivation of the memory."

As humans grow older, changes occur in all parts of the body, including the brain. According to the National Institutes of Health (2023), memory failure is approached as "a part of memory problems, forgetfulness, and aging. Some older adults have a condition called mild cognitive impairment (MCI) meaning they have more thinking problems than other people their age." MCI may be an early sign of Alzheimer's disease.

Forgetting is a failure of memory. Miller (2021) did a study on failures of memory and the fate of forgotten memories. Here, Miller considered two types of memory, which are active memory and inactive memory. To understand the processes of forgetting, he categorized 'forgetting' into four types of accounts, (a) associative interference, (b) spontaneous forgetting, (c) displacement from active memory either at acquisition or (d) inadequate retrieval cues at test. The study conveyed that forgetting is an active and functional process. It is not merely passive memory decay. Forgetting can be modulated, either enhanced or suppressed. In the future, techniques can be improved to decrease the recall of some memories such as traumatic events, old shopping lists etc.

A research study was done by Born and Wilhelm (2012) on system consolidation of memory during sleep. They gave a comprehensive review on the topic system consolidation, which explains how sleep facilitates the transfer of newly acquired memories from the hippocampus to the neocortex and takes place during slow-wave sleep (SWS). They proposed that sleep is the active system consolidation of memory. The concept of active system consolidation during sleep indicates that (a) memories are reactivated during sleep for consolidation, (b) this consolidation is selective and does not enhance every memory, and (c) memories undergo qualitative changes when transferred to long-term storage.

Ling et al. (2020) did a research project on the effects of insomnia symptoms and objective short sleep duration on memory performance in youth. A sample of 190 participants aged from 12 to 24 years were taken. All participants completed a clinical interview, a 7-day actigraphy assessment, and a series of self-report questionnaires and cognitive tests to evaluate working memory and episodic memory. The study revealed the fact that the insomnia symptoms, defined by a score ≥9 on the Insomnia Severity Index, were associated with poorer self-perceived memory and lower performance on the digit span task, while objective short sleep duration showed no such associations. No interaction effects were found between insomnia and short sleep duration on memory outcomes. These findings suggest that insomnia symptoms, rather than short sleep duration, are linked to memory performance in youth, highlighting the need for further research on underlying mechanisms and long-term neurocognitive impacts.

Memory Control

According to McGaugh (2000), memory involves "multiple systems and stages. It is information that is acquired, consolidated, and retrieved, and is centred around biological and psychological processes."

Memory Control (MC) can be defined as "the capacity to volitionally influence the contents of thought in a goal-directed fashion by reducing the accessibility of memories" (Engen & Anderson, 2018). The Memory Control consists of two mechanisms, which are (i) direct suppression (DS), involving the stopping or cancellation of the episodic retrieval process initiated by the cue, and the inhibition of the unwanted trace, and (ii) thought substitution (TS), involving the engagement of episodic retrieval, where an unwanted thought is intentionally replaced with a positive or neutral one. Their study conveyed that memory control processes may provide a mechanistic foundation for emotion regulation and this observation helped to understand its basic mechanisms and their disruption in psychiatric disorders.

Potkin and Bunney (2012) did a research study on the effect of long-term memory in early adolescence. Twenty female and twenty male adolescents, between the ages of 10 and 14, were taken as the sample. Marked changes in sleep and sleep architecture are a defining feature of adolescence. Subjects were instructed to eat their usual meals approximately one hour before learning the paired-associates and one hour before being tested on the paired-associates. Subjects were instructed to get a good night's sleep and to have a good sleep. The sleep group's mean age was 12.9 compared to 12.4 for the non-sleep group. The results revealed the importance of sleep in the consolidation of memory. Declarative memory (e.g. recall of facts) is significantly improved by sleep in a sample of normal adolescents.

A research study was conducted by Paller et al. (2021) on sleep cognition and its relation between memory. The authors discuss how sleep contributes to memories we acquire each day and how it shapes both the self and the way we perceive the world around us. During sleep, processing memories supports creativity, problem solving and emotional regulation. They addressed the fact that sleep might become maladaptive, if the individual thinks about negative thoughts, emotions or experiences repeatedly without resolving them and can affect their mental health. They conclude by emphasizing the importance of understanding sleep's role in cognitive functions to develop strategies that promote beneficial sleep cognition and decrease rumination-like activity during sleep.

1.1 *Purpose*

The purpose of the research is to study The Impact of Sleep Quality on Memory Failures and Memory Control Among the Young Adults.

1.2 *Hypothesis*

H1: There will be significant relationship between sleep quality and memory failures among young adults.

H2: There will be significant relationship between sleep quality and memory control among young adults.

2. Method

2.1 *Sample*

A total sample of 50 young adults in the age range of 18 to 25 was collected from Chandigarh, India.

2.2 *Measures*

***Memory Failures Scale (MFS*)**: Memory Failures Scale (MFS) was used to study the memory failures everyone experiences in day-to-day life. The scale was developed by Broadbent et al. (1982). The scale consisted of 12 items. Each item is rated on a five-point scale, ranging from Never (0), Rarely (1), Sometimes (2), Often (3), to Very Often (4). The scoring is done by simple summation or by calculating item mean scores. The 12 items cluster around three types of memory errors, that is, prospective memory failures (e.g., keeping appointments, remembering tasks), retrospective memory failures (e.g., remembering names) and Functional memory slips (e.g., losing track of what you're doing).

Memory Controllability Inventory (MCI) – Short Form MCI short is used for the study to assess people's beliefs about their ability to control and influence their memory functioning. The scale was developed by Lachman et al.,1995. The scale consisted of 12 items. Each item

is rated on a seven-point scale, ranging from Strongly Disagree (0), Disagree (1), Slightly Disagree (2), Neutral (3), Slightly Agree (4), Agree (5) to Strongly Agree (6). There are four subscales: Present Ability, Potential Improvement, Effort Utility, and Inevitable Decrement. The MCI provides insight not only into memory ability but also into how people think about and approach their memory.

PROMIS Sleep Disturbance – Short Form The scale was developed by Yu et al. (2011). The scale consists of 8 items. It was used in the research to study the sleep quality of the sample based on the past 7 days. For the first item, it was rated on a five-point scale ranging from Very Poor (0), Poor (1), Fair (2), Good (3) to Very Good (4). Rest of the items were rated on a five-point scale ranging from Not at all (0), A little bit (1), Somewhat (2), Quite a bit (3) to Very much (4). The scale does not have subdimensions in its scoring.

2.3 *Procedures*

Participants were informed about the study's purpose and objectives and assured of confidentiality and voluntary participation. Informed consent was obtained before data collection. The online survey, administered via Google Forms was taken for convenience. The questionnaire included standardized measures of sleep quality, memory failures and memory control. Participants were asked to respond to the questions as truthfully as possible. After completion, they were thanked for their participation, and any queries were addressed.

3. Analysis of Data

Results

Table 1: *N, Mean and Standard Deviation*

	Sleep Quality	Memory Failures	Memory Control
N	50	50	50
Mean	12.7	17.0	44.9
Standard deviation	4.22	9.14	10.7

Table 2: *Correlation between Sleep Quality, Memory Failures and Memory Control*

	Sleep Quality	Memory Failures	Memory Control
Sleep Quality	—		
Memory Failures	0.026	—	
Memory Control	0.178	-0.259	—

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

4. Discussion of Results

The objective of the study was to understand the relationship between sleep quality, memory failures and memory control. The findings indicated that sleep quality is non-significantly and positively correlated with memory failures (r=0.026). Similarly, sleep quality is non-significant and positively correlated with memory control (r=0.178). Furthermore, the correlation between memory failures and memory control is negative, which is non-significant (r= - 0.259).

Specifically, the correlation between sleep quality and memory failures indicates a very weak positive association, implying that better sleep quality is slightly linked to more memory failures, though this relationship is negligible and not statistically meaningful. Similarly, the correlation between sleep quality and memory control also shows a weak positive association, suggesting that higher sleep quality is modestly related to better memory control; however, this relationship too is not significant. Overall, these findings indicate that sleep quality does not have a meaningful impact on either memory failures or memory control in this sample.

The results indicated that as memory control increases, memory failures tend to decrease. A study conducted by Unsworth et al. (2013) highlighted the significant role of cognitive control mechanisms in mitigating everyday memory failures. The study provides important evidence for individual differences in everyday retrospective memory failures as well as significant evidence for the ecological validity of working memory capacity. Another study conducted by Cansino et al. (2019) on 519 healthy adults between the ages of 61 and 80, revealed that t individuals who employed more memory strategies and experienced less anxiety during memory tasks were less likely to experience source memory failures. These findings suggest that enhanced memory control processes can mitigate memory failures in older adults. Additionally, the study conveyed the importance of regular mental activities. These studies provide empirical support for the statement that as memory control increases, memory failures tend to decrease.

5. Conclusion

The present study examined the relationship between sleep quality, memory failures, and memory control among young adults. It was found that sleep quality has a non-significant positive relationship with both memory failures and memory control, while memory failures demonstrated a non-significant negative relationship with memory control. The findings suggest that higher memory control is associated with lower memory failures. Analysing

responses from 50 young adults reinforced the concept that sleep plays a critical role in memory control and that effective memory control helps reduce memory failures.

As adulthood goes on, sleep continues to play a crucial role in supporting cognitive functioning and daily life, particularly for young adults. Adequate sleep enhances short-term memory, helping students remember lecture content, study material, and instructions for tasks the next day. It also supports long-term memory, allowing experiences and knowledge, such as learning a new language, to be consolidated and retained over time. Rehearsal or regular review of information works hand-in-hand with sleep to strengthen memory, making recall easier and more accurate. In daily life, the presence of a good quality of sleep leads to better academic performance, improved concentration during exams, quicker decision-making, and safer activities like driving, where cognitive functions like memory, attention and alertness are crucial. Conversely, sleep deprivation can lead to forgetfulness, reduced attention, and difficulty managing everyday responsibilities, underscoring its essential role in young adults' cognitive and functioning.

In the long run, having a fixed sleep schedule is essential in everyone's life. A consistent sleep routine makes daily life easier and more comfortable. Exercising regularly, setting a consistent sleep and wake time, limiting screen time before bed, avoiding stimulants such as caffeine and nicotine late in the day, incorporating a relaxing bedtime routine into the daily schedule, and limiting afternoon naps are some suggestions to maintain a healthy sleep schedule. These tips may also help improve memory by enhancing short-term recall and supporting the consolidation of information into long-term memory. Consequently, maintaining good sleep habits can boost learning, focus, and overall cognitive performance.

References

Achermann, P., & Borbély, A. A. (2017). Sleep homeostasis and models of sleep regulation. In M. H. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and Practice of Sleep Medicine* (No.6; Issue 6, pp.377–387). Elsevier.

APA Dictionary of Psychology. (n.d.). https://dictionary.apa.org/memory

Born, J., & Wilhelm, I. (2011). System consolidation of memory during sleep. *Psychological Research*, *76*(2), 192–203. https://doi.org/10.1007/s00426-011-0335-6

Cansino, S., Torres-Trejo, F., Estrada-Manilla, C., Ramírez-Barajas, L., Pérez-Loyda, M., Nava-Chaparro, A., Hernández-Ladrón-deGuevara, M., & Ruiz-Velasco, S. (2019). Predictors of source memory success and failure in older adults. *Frontiers in Aging Neuroscience*, *11*.

Desk, T. L. (2025, September 23). Why youngsters are struggling to get quality sleep. *TheTimesofIndia*.https://timesofindia.indiatimes.com/life-style/health-fitness/health-news/why-youngsters-are-struggling-to-get-quality-sleep/articleshow/124060723.cms

Engen, H. G., & Anderson, M. C. (2018). Memory control: a fundamental mechanism of emotion regulation. *Trends in Cognitive Sciences*, *22*(11), 982–995.

Fabbri, M., Beracci, A., Martoni, M., Meneo, D., Tonetti, L., & Natale, V. (2021). Measuring Subjective Sleep Quality: A Review. *International Journal of Environmental Research and Public Health*, *18*(3), 1082.

Holcomb, B., Raisin, B. N., Gravitt, K., Herrick, L., & Mitchell, N. (n.d.). *The relationship between sleep quality and memory*. Knowledge Box.

Li, X., Fu, S., Fu, Q., & Zhong, B. (2021). Youths' Habitual Use of Smartphones Alters QualityandMemory:InsightsfromaNational Sample of Chinese Students. *International Journal of Environmental Research and Public Health*, *18*(5), 2254.

Ling, J., Sun, W., Chan, N. Y., Zhang, J., Lam, S. P., Li, A. M., Chan, J. W. Y., Kyle, S. D., & Li, S. X. (2020). Effects of insomnia symptoms and objective short sleep duration on memory performance in youths. *Journal of Sleep Research*, *29*(4).

McGaugh, J. L. (2000). Memory--a century of consolidation. *Science*, *287*(5451), 248–251. https://doi.org/10.1126/science.287.5451.248

Memory problems, forgetfulness, and aging. (2023). National Institute of Aging.

Mendonça, Fabio & Mostafa, Sheikh & Morgado-Dias, F. & García, Antonio G. & Penzel, Thomas. (2019). A Review of Approaches for Sleep Quality Analysis. *IEEE Access.* PP. 1-1. 10.1109/ACCESS.2019.2900345.

Miller, Ralph. (2021). Failures of Memory and the Fate of Forgotten Memories. Neurobiology of Learning and Memory. 181. 107426. 10.1016/j.nlm.2021.107426.

Murre, J. M. J., Kristo, G., & Janssen, S. M. J. (2013). The effect of self-reported habitual sleep quality and sleep length on autobiographical memory. *Memory*, *22*(6), 633–645.

Nelson, K. L., Davis, J. E., & Corbett, C. F. (2021). Sleep quality: An evolutionary concept analysis. *Nursing Forum*, *57*(1), 144–151.

Paller, K. A., Creery, J. D., & Schechtman, E. (2020). Memory and Sleep: How sleep cognition can change the waking mind for the better. *Annual Review of Psychology*, *72*(1), 123–150.

Potkin, K. T., & Bunney, W. E. (2012). Sleep Improves memory: The effect of sleep on long term memory in early adolescence. *PLoS ONE*, *7*(8), e42191.

Stiver, J., Fusco-Gessick, B., Moran, E., Crook, C., & Zimmerman, M. E. (2021). Variable objective sleep quality is related to worse spatial learning and memory in young adults. *Sleep Medicine*, *84*, 114–120.

Unsworth, N., McMillan, B., Brewer, G., & Spillers, G. (2013). Individual differences in everyday retrospective memory failures. *Journal of Applied Research in Memory and Cognition*,Volume 2, Issue 1,Pages 7-13,ISSN 2211-3681.