

The Mediating Role of Social Media Usage in the Relationships Between Sleep Deprivation and Cognitive Functioning Among Undergraduate Students

Ekwo, Jude Chukwudi¹; Douglas, John Ufuoma¹; Ishienyi, Ginikachukwu Jane²:

Enugu State University of Science and Technology

Agbani¹: University of Nigeria Nsukka²

Corresponded author: douglasufuoma@gmail.com

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Abstract

This study examined the mediating role of social media usage in the relationships between sleep deprivation and cognitive functioning among undergraduate students. The study adopted a correlational design and involved 100 undergraduate students. Data were collected using the Brief Pittsburgh Sleep Quality Index (B-PSQI), Cognitive Failures Questionnaire (CFQ), and Social Media Use Integration Scale (SMUIS). Mediation analysis was conducted using Hayes' PROCESS Macro Model 4, while age, gender, level of study, and mode of admission were controlled. The findings showed that sleep deprivation did not significantly predict social media usage, $B = -0.16$, $SE = 0.13$, $\beta = -.16$, $t = -1.25$, $p = .215$. Sleep deprivation also did not significantly predict cognitive functioning, $B = -0.88$, $SE = 0.50$, $\beta = -.18$, $t = -1.75$, $p = .084$. Social media usage was not a significant predictor of cognitive functioning, $B = -0.34$, $SE = 0.40$, $\beta = -.07$, $t = -0.86$, $p = .393$. The indirect effect of sleep deprivation on cognitive functioning through social media usage was not significant, $B = 0.06$, $BootSE = 0.12$, 95% CI [-0.10, 0.31]. However, age, gender, and level of study significantly predicted cognitive functioning. The study concluded that sleep deprivation and social media usage did not significantly explain cognitive functioning in the sampled undergraduates, while demographic characteristics appeared more influential.

Keywords: Sleep deprivation; sleep quality; social media usage; social media integration; cognitive functioning; cognitive failures; undergraduate students; mediation analysis.

Introduction

University education places considerable demands on students' mental abilities. Undergraduate students are expected to attend lectures, understand and retain new information, solve academic problems, make decisions, complete assignments, prepare for examinations, and manage several responsibilities at the same time (Chinawae et al., 2024; Ekwo et al., 2024, 2026; Douglas et al., 2025). These activities depend greatly on effective cognitive functioning. At the same time, students live in an environment where smartphones, social media and other digital technologies are now part of everyday life (Chinawae et al., 2024; Ekwo et al., 2024, 2026; Douglas et al., 2025). Sleep can also be affected by students' academic schedules and their use of digital devices. Recent research has therefore continued to examine how sleep and digital media behaviours may be connected with cognitive functioning in young people. For instance, recent evidence indicates that sleep restriction can affect attention and memory, while research on social media shows that its effects on cognitive functioning are not always the same and may depend on the intensity and nature of use (Crowley et al., 2024; Wüst et al., 2024; Naik et al., 2025).

Cognitive functioning refers to the mental processes through which a person receives, processes, stores, uses, and responds to information (Naik et al., 2025). It covers several important abilities, including attention, memory, working memory, problem-solving, decision-making, cognitive flexibility, and inhibitory control. These abilities are particularly important for undergraduate students because learning at the university level requires students to concentrate on information, remember what they have learnt, connect new knowledge with previous knowledge, solve problems, and make appropriate decisions (Naik et al., 2025). Executive functions form an important part of cognitive functioning and include processes such as working memory, cognitive flexibility, planning, and inhibitory control. These abilities help individuals organise their behaviour and deal effectively with complex tasks. Recent research continues to identify attention, memory, and executive functioning as important components of cognitive functioning among young people (Naik et al., 2025).

Cognitive functioning is not fixed and can be affected by a person's physical condition, lifestyle, environment, and daily experiences. This is important in the case of undergraduate students because factors that interfere with attention, memory or executive functioning may make academic activities more difficult. Recent evidence shows that sleep restriction can affect particular aspects of cognition. Wüst et al. (2024), in a systematic review and meta-analysis of 44 studies, found that one night of restricted sleep increased sleepiness and impaired sustained attention. However, the same review did not find significant effects of one night of sleep restriction on all the cognitive outcomes examined, including working memory and inhibitory control. This suggests that the relationship between sleep and cognition may depend on the particular cognitive ability being considered.

Sleep deprivation refers to obtaining less sleep than the body and brain require for normal functioning ((Alimoradi et al., 2024). It may occur when an individual deliberately reduces sleeping time or when other circumstances prevent adequate sleep. For undergraduate students, insufficient sleep may result from late-night studying, academic workload, social activities, entertainment, employment, personal responsibilities, or prolonged use of digital devices. The concern is that repeatedly getting insufficient sleep may leave students tired during the day and may interfere with some of the mental processes required for effective learning (Crowley et al., 2024). Recent research provides evidence that inadequate sleep can have cognitive consequences. Crowley et al. (2024), in a systematic and meta-analytic review, found that restricting sleep had a small but significant negative effect on memory formation. Their findings indicated that sleep restriction could affect both the encoding and consolidation of memories. Similarly, Wüst et al. (2024) reported that even one night of restricted sleep was associated with poorer sustained attention. More recent evidence from Cao et al. (2025), based on a meta-analysis of 79 publications, also showed that sleep loss affected core executive functions, including working memory, inhibitory control, and cognitive flexibility, although the effects differed according to the task and cognitive component being assessed.

These findings make sleep deprivation an important variable to examine among undergraduate students. However, the existing evidence also shows that the effect of inadequate sleep is not necessarily the same across all areas of cognitive functioning. This is important because it suggests that further studies are needed to determine whether sleep deprivation is significantly associated with overall cognitive functioning in particular student populations. It is therefore not enough to assume that because sleep restriction has been associated with particular cognitive difficulties in previous research, the same relationship must occur in every group of undergraduate students. Social media usage refers to the use of online platforms that allow individuals to communicate, share information, create or view content, and interact with other people (Li et al., 2024). Social media has become a normal part of young people's daily activities and may serve different purposes. Students may use social media to communicate

with friends and classmates, participate in academic groups, obtain information, watch videos, follow current events, or simply entertain themselves. Because of these different purposes, social media usage should not automatically be regarded as harmful.

However, concern has been raised about excessive or problematic use and its possible effect on cognitive functioning. A recent systematic review by Naik et al. (2025) examined 23 studies involving children and young adults and found mixed evidence. The review reported that excessive social media use was associated in some studies with poorer attention, reduced working memory, and weaker executive functioning. At the same time, some forms of social media engagement, particularly educational use, were associated with potential benefits in areas such as memory and language. The authors therefore concluded that the effect of social media may depend on factors such as the platform being used, intensity of use, nature of engagement, and individual characteristics. Social media may also be connected with students' sleeping patterns. Students who remain online late at night may reduce the amount of time available for sleep, while students experiencing sleep difficulties may turn to social media during periods when they would normally be sleeping. A longitudinal study involving university students by Li et al. (2024) found evidence of a dynamic relationship between social networking site use and sleep problems. In that study, sleep problems at one time point predicted subsequent social networking site use, while earlier social networking site use showed a weaker relationship with later sleep problems. The finding suggests that the relationship may operate in both directions rather than being a simple case of social media use causing poor sleep. The connection between social media and sleep is also not always consistent when social media use is measured objectively. Recent longitudinal research among university students found that overall daily social media duration was not associated with several sleep outcomes, although some individual platforms showed associations with particular sleep measures. This suggests that the type of platform and pattern of use may matter, rather than simply the total amount of time spent on social media. The need for the present study arises from the fact that sleep deprivation, social media usage, and cognitive functioning may occur together in the everyday life of undergraduate students, yet their relationships are not straightforward. Existing research provides evidence that sleep restriction can impair particular cognitive abilities, especially attention and memory, but the effects are not uniform across all cognitive domains (Crowley et al., 2024; Wüst et al., 2024; Cao et al., 2025). Similarly, recent evidence on social media and cognitive functioning is mixed, with both possible negative effects of excessive use and possible benefits from educational engagement (Naik et al., 2025). Another reason for the study is that the relationship between sleep and social media usage may be more complicated than it appears. Evidence from university students suggests that sleep problems can precede increased social networking site use, while social networking site use may also be associated with later sleep problems (Li et al., 2024). This raises the possibility that social media usage could be involved in the relationship between sleep deprivation and cognitive functioning. However, the available evidence does not establish that social media usage necessarily acts as a pathway through which sleep deprivation affects cognitive functioning. It is therefore important to examine the three variables together among undergraduate students. Rather than assuming that poor sleep automatically results in poor cognitive functioning or that social media automatically damages cognition, the present study seeks to establish what the data show among the students studied. This is particularly important because the effects of social media appear to vary according to how it is used, while the effects of sleep restriction may vary according to the cognitive ability being assessed. Examining social media usage as a possible mediator also provides a more complete understanding of whether the relationship between sleep deprivation and cognitive functioning can be explained through students' social media behaviour.

A related Nigerian study by Chinawa et al. (2024), also examined problematic internet use among undergraduate students. The researchers investigated whether core self-evaluation and loneliness predicted internet addiction among 247 students at Enugu State University of Science and Technology. Their findings showed that neither core self-evaluation nor loneliness significantly predicted internet addiction. This result is relevant to the present study because it suggests that digital behaviour among university students may not be adequately explained by a single psychological or social factor. It also supports the need to examine the specific pattern and context of digital engagement when considering its possible relationship with sleep and cognitive functioning (Chinawa et al., 2024).

The present study was consequently designed to examine the relationship between sleep deprivation, social media usage, and cognitive functioning among undergraduate students. It specifically sought to determine whether sleep deprivation is related to cognitive functioning, whether social media usage is related to cognitive functioning, whether sleep deprivation is related to social media usage, and whether social media usage provides a significant pathway through which sleep deprivation is related to cognitive functioning.

Hypotheses

Based on the issues raised above, the study tested the following hypotheses:

1. Sleep deprivation will significantly relate to cognitive functioning among undergraduate students.
2. Social media usage will significantly relate to cognitive functioning among undergraduate students.
3. Sleep deprivation will significantly relate to social media usage among undergraduate students.
4. Social media usage will significantly mediate the relationship between sleep deprivation and cognitive functioning among undergraduate students.

I can rewrite it in original wording and improve the academic flow. One issue I noticed is that the text says **672 participants**, while the institutional figures listed under the procedure add up to **766**; this should be checked before submission.

Method

Participants

The study involved 672 undergraduate students comprising 447 females and 225 males. The participants were between 16 and 29 years of age, with a mean age of 20.90 years and a standard deviation of 3.177. The participants were drawn from nine higher institutions, consisting of eight universities and one college of education. The universities included the University of Benin, University of Ilorin, Enugu State University of Technology, Agbani, Ladoke Akintola University of Technology, Michael Okpara University of Agriculture, Umudike, Lagos State University, University of Lagos, University of Nigeria, Nsukka, and the Federal University of Petroleum Resources. The college of education was Yaba College of Technology.

A multi-stage sampling approach involving purposive and availability sampling techniques was used. Availability sampling was used in identifying the institutions that were accessible to the researcher, while purposive sampling was used in selecting undergraduate students who met the requirements for participation. The inclusion criterion was that participants must be registered regular undergraduate students of any of the selected institutions. Individuals who were not regular undergraduate students of the selected institutions were excluded from the study.

Instruments

Three instruments were used for data collection. They were:

- I. Brief Pittsburgh Sleep Quality Index (B-PSQI) (Sancho Domingo et al., 2021)
- II. Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982)
- III. Social Media Use Integration Scale (SMUIS)

Brief Pittsburgh Sleep Quality Index (B-PSQI) (Sancho Domingo et al., 2021)

Sleep quality in this study was assessed using the Brief Pittsburgh Sleep Quality Index (B-PSQI), an abbreviated form of the original Pittsburgh Sleep Quality Index (PSQI). The B-PSQI consists of six questions extracted from the original PSQI through reliability and factor analyses (Sancho-Domingo et al., 2021).

The original PSQI (from which the B-PSQI is derived) has been applied and evaluated in African populations, including Nigerian student samples. A validation study conducted among Nigerian university students reported that the PSQI demonstrated moderate utility in screening for insomnia, with a recommended cut-off score of 5 on the global PSQI score (0–21) showing acceptable sensitivity and specificity metrics in this population (best cut-off at 5; sensitivity = 0.720, specificity = 0.545) despite cultural and contextual differences relative to Western samples (Aloba et al., 2007). Additionally, cross-cultural adaptation of the original PSQI in Igbo language speakers in Southeast Nigeria demonstrated acceptable internal consistency (Cronbach's $\alpha = 0.70$) and excellent correlation with the English PSQI, supporting the applicability of PSQI constructs in Nigerian sleep research (Cross-cultural adaptation of PSQI, 2024).

Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982)

The Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982). The instrument was designed to measure everyday cognitive failures, including lapses in attention, memory, perception, and motor functioning. It assesses how often individuals experience mistakes such as forgetting appointments, losing concentration, failing to notice signposts, or making errors in routine activities. The CFQ is commonly used as a measure of cognitive performance and cognitive functioning in educational, clinical, and occupational settings. Broadbent et al. (1982) reported a Cronbach's alpha coefficient of .89, indicating excellent internal consistency. Test-retest reliability over extended periods has ranged between .71 and .82, demonstrating good stability over time. The CFQ has demonstrated satisfactory construct and convergent validity through significant associations with attention, memory performance, stress, fatigue, and cognitive functioning measures. Research has consistently shown that the instrument effectively differentiates individuals with higher and lower levels of cognitive efficiency, supporting its validity as a measure of cognitive performance.

Social Media Use Integration Scale (SMUIS)

The Social Media Use Integration Scale (SMUIS) was developed by Jenkins-Guarnieri, Wright, and Johnson (2013) to assess the extent to which social media is integrated into an individual's daily life, relationships, and emotional functioning. The SMUIS is a 10-item self-report questionnaire structured around a four-point Likert response format ranging from strongly disagree to strongly agree. It measures two core dimensions: Social Integration and Emotional Connection (SIEC), and Social Integration and Routine Use (ISR). The SIEC subscale evaluates the emotional reliance on social media for maintaining relationships and feelings of connectedness, while the ISR subscale assesses the extent to which social media use is embedded in daily habits and communication routines. Higher scores on the scale indicate greater integration of social media into an individual's social and emotional life. In terms of

psychometric properties, Jenkins-Guarnieri et al. (2013) reported that the SMUIS demonstrates strong internal consistency reliability. The overall Cronbach's alpha coefficient for the full scale was reported to be above .80, indicating good reliability, while the subscales also showed acceptable reliability coefficients ranging from approximately .79 to .85. These values suggest that the instrument is stable and consistent in measuring the construct of social media integration across different items.

Procedure

The researcher obtained participants from the selected universities and college of education using purposive and availability sampling techniques. The institutions were selected based on their accessibility to the researcher, while individual participants were selected purposively based on the study's inclusion criterion. Regular undergraduate students who consented to participate were eligible to take part in the research.

Research assistants were recruited from some of the selected institutions to assist with the administration and retrieval of the questionnaires. The research assistants were briefed on the purpose of the study and the appropriate procedure for distributing and collecting the instruments. Both paper-based and online versions of the questionnaires were used to reach participants. For the institutions where physical administration was adopted, questionnaires were distributed directly to eligible undergraduate students. A total of 268 copies were distributed across ESUT and UNN. Of these, 263 copies were returned. During the screening process, six questionnaires were found to have been improperly completed, while two others were incomplete and were therefore excluded from the analysis. For participants from the other institutions, the questionnaires were administered electronically through Google Forms.

Only questionnaires that were sufficiently and appropriately completed were retained for data analysis. Incomplete or improperly completed responses were excluded from the final dataset.

Design and Statistics

A correlational research design was adopted for the study. The design was considered appropriate because the study examined the relationships among the variables without manipulating or controlling them experimentally. Correlational research allows the researcher to determine the direction and strength of relationships between naturally occurring variables (Bhandari, 2023). The data obtained from the participants were analysed using the Statistical Package for the Social Sciences (SPSS). Mediation analysis was conducted using Hayes' PROCESS macro to examine the direct and indirect relationships among the study variables. The mediation procedure was used to determine whether the proposed mediating variable significantly explained the relationship between the predictor and outcome variables.

Results

Table 1: Regression Results for Sleep Deprivation, Social Media Usage, and Cognitive Functioning Among Undergraduate Students

Predictor	Social Media Usage B	SE	β	t	p	Cognitive Functioning B	SE	β	t	p
Sleep deprivation	-0.16	0.13	-.16	-1.25	.215	-0.88	0.50	-.18	-1.75	.084
Age	-0.15	0.15	-.11	-1.00	.322	-2.99	0.57	-.47	-5.25	<.001
Gender	0.19	1.01	.02	0.19	.849	-11.33	3.88	-.26	-2.92	.004
Level of study	0.98	0.68	.21	1.44	.154	14.89	2.67	.66	5.58	<.001

Predictor	Social Media Usage B	SE	β	t	p	Cognitive Functioning B	SE	β	t	p
Mode of admission	1.14	1.07	.13	1.07	.286	3.67	4.14	.09	0.89	.377

Note. β = standardized regression coefficient. LOS = level of study; MOA = mode of admission. Analyses controlled for age, gender, LOS, and MOA. The model predicting social media usage was not significant, $R^2 = .049$, $F(5, 94) = 0.96$, $p = .446$. The model predicting cognitive functioning was significant, $R^2 = .397$, $F(6, 93) = 10.21$, $p < .001$.

The first hypothesis stated that sleep deprivation would significantly relate to cognitive functioning among undergraduate students. The result showed a negative relationship between sleep deprivation and cognitive functioning, $B = -0.88$, $\beta = -.18$, $t = -1.75$, $p = .084$. This means that students with higher sleep deprivation tended to have lower cognitive functioning. However, the relationship was not statistically significant because the p -value was greater than .05. Therefore, Hypothesis 1 was not supported.

The second hypothesis stated that social media usage would significantly relate to cognitive functioning. Social media usage had a negative but weak relationship with cognitive functioning, $B = -0.34$, $\beta = -.07$, $t = -0.86$, $p = .393$. Since the relationship was not significant, Hypothesis 2 was not supported.

The third hypothesis stated that sleep deprivation would significantly relate to social media usage. Sleep deprivation had a negative relationship with social media usage, $B = -0.16$, $\beta = -.16$, $t = -1.25$, $p = .215$. This means that higher sleep deprivation was associated with slightly lower social media usage, but the relationship was not statistically significant. Therefore, Hypothesis 3 was not supported.

The demographic variables produced some important findings. Age significantly predicted cognitive functioning, $B = -2.99$, $\beta = -.47$, $t = -5.25$, $p < .001$. The negative coefficient means that, within this sample and after controlling for the other variables, higher age was associated with lower cognitive functioning. This was one of the stronger predictors in the model.

Gender also significantly predicted cognitive functioning, $B = -11.33$, $\beta = -.26$, $t = -2.92$, $p = .004$. This indicates that cognitive functioning differed significantly according to the gender coding used in the study. However, the exact direction should be explained using the study's gender coding (for example, whether 1 = male and 2 = female) rather than simply saying that one gender had higher scores.

Similarly, level of study significantly predicted cognitive functioning, $B = 14.89$, $\beta = .66$, $t = 5.58$, $p < .001$. This was the strongest standardized predictor in the cognitive functioning model. It suggests that students' level of study was significantly associated with their cognitive functioning. Again, the positive direction should be interpreted according to how the levels of study were coded in the dataset.

However, age, gender, level of study, and mode of admission did not significantly predict social media usage. Age had $p = .322$, gender had $p = .849$, level of study had $p = .154$, and mode of admission had $p = .286$. Therefore, none of these demographic variables made a statistically significant contribution to social media usage in this model.

Mode of admission also did not significantly predict cognitive functioning, $B = 3.67$, $\beta = .09$, $t = 0.89$, $p = .377$. Thus, among the demographic variables, age, gender, and level of study were significant predictors of cognitive functioning, while mode of admission was not.

Table 2: Mediation Analysis of Social Media Usage in the Relationship Between Sleep Deprivation and Cognitive Functioning

Predictor/Effect	B	SE	β	<i>t</i>	<i>p</i>	BootSE	BootLLCI	BootULCI
Outcome: Social media usage								
Sleep deprivation	-0.16	0.13	-.16	-1.25	.215	—	-0.42	0.10
Age	-0.15	0.15	-.11	-1.00	.322	—	-0.44	0.15
Gender	0.19	1.01	.02	0.19	.849	—	-1.81	2.19
Level of study	0.98	0.68	.21	1.44	.154	—	-0.37	2.34
Mode of admission	1.14	1.07	.13	1.07	.286	—	-0.97	3.26
Outcome: Cognitive functioning								
Sleep deprivation (direct effect)	-0.88	0.50	-.18	-1.75	.084	—	-1.88	0.12
Social media usage	-0.34	0.40	-.07	-0.86	.393	—	-1.13	0.45
Age	-2.99	0.57	-.47	-5.25	<.001	—	-4.12	-1.86
Gender	-11.33	3.88	-.26	-2.92	.004	—	-19.04	-3.62
Level of study	14.89	2.67	.66	5.58	<.001	—	9.59	20.18
Mode of admission	3.67	4.14	.09	0.89	.377	—	-4.54	11.89
Total effect of sleep deprivation	-0.83	0.50	-.17	-1.65	.101	—	-1.82	0.17
Indirect effect through social media usage	0.06	—	—	—	—	0.12	-0.10	0.31

Note. β = standardized regression coefficient. LOS = level of study; MOA = mode of admission. CI = confidence interval. Bootstrap confidence intervals are based on 5,000 bootstrap samples. The indirect effect is considered significant when the 95% bootstrap confidence interval does not contain zero. The cognitive functioning model explained 39.7% of the variance, $R^2 = .397$, $F(6, 93) = 10.21$, $p < .001$.

The fourth hypothesis proposed that social media usage would significantly mediate the relationship between sleep deprivation and cognitive functioning among undergraduate students. The result did not support this hypothesis.

The total effect of sleep deprivation on cognitive functioning was negative but not significant, $B = -0.83$, $\beta = -.17$, $t = -1.65$, $p = .101$. This means that before social media usage was introduced into the model, sleep deprivation did not significantly predict cognitive functioning. When social media usage was added to the model, the direct effect of sleep deprivation on cognitive functioning remained negative and non-significant, $B = -0.88$, $\beta = -.18$, $t = -1.75$, $p = .084$. Therefore, the inclusion of social media usage did not make the relationship statistically significant. The most important finding for the mediation hypothesis is the indirect effect. The indirect effect of sleep deprivation on cognitive functioning through social media usage was $B = 0.06$. The 95% bootstrap confidence interval ranged from -0.10 to 0.31. Because the interval includes zero, the indirect effect was not significant. Therefore, social media usage did not mediate the relationship between sleep deprivation and cognitive functioning. Consequently, Hypothesis 4 was not supported.

The demographic variables again showed some significant effects on cognitive functioning. Age significantly predicted cognitive functioning, $B = -2.99$, $\beta = -.47$, $p < .001$, indicating a significant negative association. Gender also significantly predicted cognitive functioning, $B = -11.33$, $\beta = -.26$, $p = .004$, showing that cognitive functioning differed significantly across the

gender categories used in the study. Level of study was also significant, $B = 14.89$, $\beta = .66$, $p < .001$, indicating a substantial positive association with cognitive functioning based on the coding used. On the other hand, mode of admission did not significantly predict cognitive functioning, $B = 3.67$, $\beta = .09$, $p = .377$. The demographic variables also did not significantly predict social media usage, as age, gender, level of study, and mode of admission all had p -values above .05.

In summary, all four hypotheses were not supported. Sleep deprivation showed a negative relationship with cognitive functioning, but the relationship was not statistically significant. Social media usage also showed a small negative relationship with cognitive functioning, but this was not significant. Sleep deprivation did not significantly predict social media usage, and social media usage did not significantly mediate the relationship between sleep deprivation and cognitive functioning.

However, the demographic variables produced clearer results. Age, gender, and level of study significantly predicted cognitive functioning, while mode of admission did not. None of the demographic variables significantly predicted social media usage. This suggests that, in this sample, differences in cognitive functioning were more strongly associated with demographic characteristics such as age, gender, and level of study than with sleep deprivation or social media usage. Below is a thesis-ready discussion written in simple, natural Nigerian academic English. The four hypotheses are discussed separately, followed by the theoretical implication, practical implications, limitations, suggestions for further studies, summary, and conclusion.

Discussion of Findings

The first hypothesis stated that sleep deprivation would significantly relate to cognitive functioning among undergraduate students. The finding did not support this hypothesis. Sleep deprivation had a negative relationship with cognitive functioning, but the relationship was not statistically significant. This means that although students who reported higher sleep deprivation tended to show lower cognitive functioning, the relationship was not strong enough in this study to conclude that sleep deprivation significantly predicted cognitive functioning.

This finding may be explained by the fact that students do not all respond to inadequate sleep in the same way. Some students may be able to cope with occasional lack of sleep without experiencing noticeable difficulties in their thinking, attention, or memory. Also, cognitive functioning can be influenced by several other factors, including age, academic level, stress, motivation, study habits, and individual differences. In the present study, age and level of study were significant predictors of cognitive functioning, suggesting that these factors may have played a more important role than sleep deprivation. Therefore, although the direction of the result was consistent with the expectation that poor sleep may be associated with poorer cognitive functioning, the evidence was not sufficient to support the hypothesis.

The second hypothesis stated that social media usage would significantly relate to cognitive functioning among undergraduate students. This hypothesis was also not supported. Social media usage had a negative but weak relationship with cognitive functioning. This shows that increased social media usage was associated with a slight reduction in cognitive functioning, but the relationship was not statistically significant.

One possible explanation is that social media usage among students is not necessarily harmful to cognitive functioning in every situation. The effect may depend on how the platforms are used, the type of content students engages with, and the amount of time spent online. For example, using social media for academic discussions, accessing educational materials, or communicating with classmates may have a different effect from spending long periods scrolling through entertainment content. Therefore, simply measuring general social media usage may not capture the specific pattern of use that could affect cognitive functioning. The

non-significant finding may also suggest that other factors, rather than social media usage alone, are more important in explaining differences in cognitive functioning among the students.

The third hypothesis proposed that sleep deprivation would significantly relate to social media usage. The finding did not support this hypothesis. Sleep deprivation had a negative relationship with social media usage, but the relationship was not statistically significant. In practical terms, students with higher levels of sleep deprivation tended to report slightly lower social media usage, although this difference was not large enough to be considered statistically meaningful. This finding is somewhat different from the expectation that students who spend more time on social media may sleep less because of late-night phone use. One possible reason is that sleep deprivation and social media usage may be influenced by other factors that were not directly examined in the study. Academic workload, examination periods, personal responsibilities, entertainment activities, employment, stress, and students' individual sleeping habits can all affect sleep. Similarly, students can use social media at different times of the day without necessarily reducing their sleeping hours. The result therefore suggests that the relationship between sleep deprivation and social media usage may be more complicated than simply assuming that increased social media use automatically leads to inadequate sleep.

The fourth hypothesis stated that social media usage would significantly mediate the relationship between sleep deprivation and cognitive functioning among undergraduate students. This hypothesis was not supported. The indirect effect of sleep deprivation on cognitive functioning through social media usage was $B = 0.06$, with a 95% bootstrap confidence interval ranging from -0.10 to 0.31. Since the confidence interval included zero, the indirect effect was not statistically significant. This finding means that social media usage did not explain how sleep deprivation was related to cognitive functioning among the students. In other words, the data did not show that sleep deprivation significantly increased or decreased social media usage in a way that subsequently affected cognitive functioning. The direct effect of sleep deprivation on cognitive functioning was also not significant. Therefore, there was no sufficient evidence for the proposed mediation pathway. The finding may indicate that other variables may be more relevant in explaining the connection between sleep and cognitive functioning. For instance, stress, academic workload, psychological well-being, physical activity, caffeine consumption, sleep quality, and study habits may be worth examining in future research.

Implication of the Findings

The findings can be understood using cognitive load theory, which explains that human cognitive capacity is limited and that excessive demands can interfere with learning, attention, memory, and information processing. From this perspective, inadequate sleep and excessive digital engagement could theoretically place additional demands on students' cognitive resources. However, the present findings did not establish significant relationships between sleep deprivation, social media usage, and cognitive functioning. This suggests that the theory may not be sufficient on its own to explain differences in students' cognitive functioning. The significant effects of age and level of study further suggest that students' cognitive functioning may depend on several interacting personal and academic factors rather than sleep deprivation or social media usage alone. The findings have some useful implications for students, universities, lecturers, counsellors, and other people involved in undergraduate education.

First, universities should continue to educate students about the importance of healthy sleep habits. Although sleep deprivation was not a significant predictor of cognitive functioning in this study, the negative direction of the relationship shows that poor sleep should not be completely ignored. Students can benefit from education on maintaining regular sleeping hours, reducing unnecessary late-night activities, and creating a suitable environment for sleep.

Second, students should be encouraged to develop a balanced approach to social media. The finding that social media usage did not significantly predict cognitive functioning does not mean that unrestricted social media use is always beneficial. Students should learn to distinguish between productive and unproductive online activities and avoid allowing social media to interfere with academic responsibilities, rest, and face-to-face interaction.

Third, academic institutions should pay attention to factors associated with **age and level of study**, since these variables significantly predicted cognitive functioning in the present study. Students at different levels may have different academic demands and may require different forms of academic support. Fresh students, for example, may need orientation and study-skills support, while students in higher levels may need assistance with more demanding academic tasks and project work.

Fourth, university counselling centres can provide programmes that help students manage academic workload, develop effective study habits, organise their time, and maintain healthy daily routines. Rather than focusing only on social media or sleep as isolated problems, interventions should consider the broader lifestyle and academic experiences of undergraduate students. Finally, lecturers and university administrators can help by avoiding unnecessary academic demands that encourage students to maintain unhealthy study schedules, particularly when examinations and major academic deadlines are approaching.

Limitations of the Study

The study has some limitations that should be considered when interpreting the findings. First, the study used a small sample of undergraduate students. This relatively small sample may have reduced the ability of the analysis to detect weak relationships between the variables. A larger sample could produce different results and provide greater confidence in the findings.

Second, the study appears to have relied on self-reported information. Students may not always report their sleep deprivation or social media usage exactly as it occurs in their daily lives. Some participants may have underestimated or overestimated the amount of time they spend online or the extent to which they experience sleep difficulties.

Third, the study used a correlational design, meaning that the variables were measured at one point in time. As a result, the study establishes cause-and-effect relationships. It cannot be concluded, for example, that sleep deprivation causes changes in cognitive functioning or that social media usage causes poor cognitive functioning.

Fourth, the study measured social media usage generally. Different social media platforms and activities may have different effects on students. Time spent on educational content may not have the same effect as time spent on entertainment, gaming-related content, or passive scrolling. Finally, other factors that may influence cognitive functioning were not included in the model. Variables such as stress, anxiety, academic workload, sleep quality, physical activity, caffeine consumption, study habits, and psychological well-being may also be important.

Suggestions for Further Studies

Future researchers should consider using a larger and more diverse sample of undergraduate students from different universities and locations. This would make it easier to determine whether the findings are applicable beyond the students included in the present study.

Future studies should also use a longitudinal design to examine the variables over time. Such an approach would provide better information about whether changes in sleep deprivation or social media usage are followed by changes in cognitive functioning.

Researchers should further examine different types of social media usage rather than treating all social media activities as one category. Studies can distinguish between academic use, communication, entertainment, passive scrolling, and active participation.

It would also be useful to examine other possible mediators or moderators. Variables such as sleep quality, academic stress, psychological well-being, self-control, study habits, and time management may provide a better explanation of the relationship between sleep and cognitive functioning. Finally, future researchers could combine questionnaires with more objective measures, such as sleep-tracking devices, screen-time records, or standardised cognitive tasks. This would reduce the problems associated with relying entirely on self-reported information.

Summary and Conclusion

The study examined the mediating role of social media usage in the relationships between sleep deprivation and cognitive functioning among undergraduate students. Four hypotheses were tested. The first hypothesis proposed that sleep deprivation would significantly relate to cognitive functioning, but the finding was not significant. The second hypothesis proposed that social media usage would significantly relate to cognitive functioning, and this was also not supported. The third hypothesis proposed a significant relationship between sleep deprivation and social media usage, but the finding was again not significant. The fourth hypothesis proposed that social media usage would mediate the relationship between sleep deprivation and cognitive functioning. The mediation analysis showed that the indirect effect was not significant because the bootstrap confidence interval included zero.

However, the demographic variables produced some significant findings. Age, gender, and level of study significantly predicted cognitive functioning, whereas mode of admission did not. None of the demographic variables significantly predicted social media usage. The cognitive functioning model as a whole was significant and explained 39.7% of the variance in cognitive functioning. Based on the findings, the study concludes that sleep deprivation and social media usage did not significantly predict cognitive functioning among the undergraduate students studied. Sleep deprivation also did not significantly relate to social media usage, and social media usage did not significantly mediate the relationship between sleep deprivation and cognitive functioning. Therefore, all four hypotheses were not supported.

Nevertheless, the findings should not be interpreted to mean that sleep deprivation and social media usage have no relevance to students' cognitive functioning generally. Rather, the present sample did not provide sufficient statistical evidence for the proposed relationships. The significant contributions of age, gender, and level of study suggest that cognitive functioning among undergraduate students is influenced by a wider range of personal and academic factors. Future research should therefore move beyond looking at sleep deprivation and social media usage in isolation and examine the broader combination of lifestyle, academic, and psychological factors that may influence how well university students think, learn, concentrate, and perform academically.

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