

AM I OVER-SLEEPER? OVERSLEEPING AND COGNITIVE FUNCTIONING AMONG UNIVERSITY STUDENTS: MEDIATING ROLE OF MENTAL WELLBEING

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¹**Sidra Ilyas**

¹ *Clinical Psychologist, Lecturer at Shiblee College for women, Faisalabad*
sidrailyasch@gmail.com

²**Alia Asmat**

² *Associate Professor, Department of Psychology, University of Central Punjab, Lahore*

³**Muhammad Iqbal Naeem**

³ *Consultant Psychiatrist, Senior Lecturer in Psychiatry University of Manchester, UK*

⁴**Haleema Khatoon**

⁴ *Clinical Psychologist RBT/IBT, Dubai, United Arab Emirates*
haleema.khatoon786@gmail.com

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Abstract

Sleep and mental well-being play crucial roles in the normal cognitive functioning of university students. The present study aims to explore the predictive roles of oversleeping and mental well-being in the relationship with cognitive function. Cross-sectional research design was used. A total of 359 university students (male=161 and female=198), selected by purposive sampling, completed the survey, adhering to inclusion and exclusion criteria. The results reveal a significant negative correlation between university students' oversleeping and cognitive functioning ($r=-0.173$, $p<0.01$) as well as mental well-being ($r=-0.372$, $p<0.01$). Multiple regression analysis confirms that both oversleeping ($\beta=0.107$, $t=2.713$, $p=0.007$) and Cognitive Functioning ($\beta=0.754$, $t=19.084$, $p=0.000$) are significant predictors of mental well-being. Mediation analysis was done through AMOS. Results showed partial mediation. Mediation analysis indicates that mental well-being serves as a significant mediator ($p=0.000$) with an estimated value of 0.407 ($SE=0.21$, $p=0.000$). These findings underscore the importance of incorporating mental well-being and sleep duration considerations into interventions aimed at promoting cognitive health among university students.

Keywords: *Oversleeping, Mental Well-Being, Cognitive Functioning, University Students*

INTRODUCTION

In the realm of higher education, university students often face a multitude of challenges that can impact their performance in educational settings and overall well-being. Among these challenges, sleep patterns play a crucial role, with both insufficient and excessive sleep posing significant threats to cognitive function and mental health. The American National Sleep Foundation recommends a sleep duration of 8 hours for young adults to maintain peak mental and physical health (Hirshkowitz et al., 2015; Wallis, 2020). While the detrimental effects of sleep deprivation have been extensively studied in different years, by different researchers (Alhola, 2007; Durmer, 2005; Gallicchio & Kalesan, 2009; Killgore, 2010; Sivertsen et al., 2015), there exists a notable gap in understanding the consequences of oversleeping, particularly among the university student population (Fong, 2021). The demanding nature of university life, characterized by tight deadlines, work commitments, and social activities, often leads students to experience sleep deprivation during weekdays (Coveney, 2014; Curcio et al., 2006). This can adversely affect cognitive abilities and productivity (Alhola & Polo-Kantola, 2007). To compensate for weekday sleep loss, students may adopt the habit of oversleeping during weekends, contributing to an unhealthy sleep cycle over time (Abdullah et al., 2014).

Oversleeping, characterized by a habitual extension of sleep duration beyond the recommended range without medical necessity (Sletten et al., 2023), has garnered limited attention in empirical research compared to its counterpart, sleep deprivation. However, recent studies have begun to highlight the potential adverse effects of oversleeping on physical and mental well-being (Fong et al., 2021). Empirical studies found that oversleeping has been associated with an increased risk of morbidity or mortality, and the effect size of long sleep was sometimes greater than that of short sleep, as revealed by a study that a significant relative risk of mortality among women for those reporting oversleeping (Patel et al., 2004). A person who oversleeps has twenty to thirty percent greater mortality risks as compared to an individual who sleeps less time than required (Kronholm et al., 2011). Other studies also found that individuals habitually oversleeping are at greater risk of chronic illness and mortality compared to those who maintain a recommended sleep duration of seven to eight hours a day (AlDabal & BaHammam, 2011; Chattu et al., 2019). Oversleeping has also been linked to mental well-being. They found that depressed adults exhibited significant and greater fluctuations in daily affect as a function of nightly sleep duration than non-depressed adults. Specifically, the degree of decrease in positive affect and increase in negative affect was greater when depressed adults slept 2 or more hours less or longer than their usual sleep hours (Lee, 2024).

Mental Well-being as a condition of well-being in which an individual effectively copes with daily stressors, recognizing their abilities positively and contributing to positive functioning

for societal betterment (Jaggi & Saleem, 2020; Kapur, 2021). One study reported that individuals with depression are more likely to sleep less than 6 hours and/or longer than 10 hours (Lee et al., 2024). Conditions against mental wellbeing such as depression, headaches, obesity, back pain, heart diseases, and diabetes have been linked to excessive sleep (Virtanen, 2012).

Mental well-being is very important for normal cognitive functioning. Empirical studies have been conducted to prove this connection. One of the study proved that people with poor mental wellbeing, having bipolar disorder have poor cognitive functions than healthy people, especially regarding to verbal memory (Martínez-arán et al., 2004). Another study was conducted on this relationship, concluded that people with depression have defaults in cognitive functions, but mild levels of depression did not affect cognitive functions (Airaksinen, Larsson, Lundberg & Forsell, 2004). Many researchers searched for the reasons of impaired cognitive functions and poor academic performance. They found a strong relationship between life stress, low mental wellbeing and ultimately impaired cognitive performances (Pechtel & Pizzagalli, 2011).

In empirical studies, mental wellbeing was used as a mediator. One study conducted on psychological flexibility and life satisfaction with mediating role of mental wellbeing. Their data support the hypothesis that mental health mediates the effect of psychological flexibility on life satisfaction (Lucas & Moore, 2020). Previous studies proved that mental wellbeing plays a significant mediating role. No previous study used mental wellbeing as a mediator between oversleeping and cognitive functions and the gap is filled by this study.

Cognitive function is a vital component of overall well-being, and disruptions in sleep patterns have been associated with various cognitive impairments (Wennberg et al., 2017). While the detrimental effects of sleep deprivation on cognitive performance are well-established, the relationship between oversleeping and cognitive functioning is still undermined (Leibowitz et al., 2006). Human beings spend about one-third of their lifetime asleep, and the processes occurring during sleep cycles are essential for survival, encompassing nerve cell communication, tissue repair, and hormonal regulation (Nemeskal et al., 2021). But sleep, greater than normal sleeping hours (oversleeping) can reverse this process.

Empirical studies have suggested an association between oversleeping and cognitive functioning (Leng & Yaffe, 2020). A longitudinal study conducted by Wu et al. (2021) observed declines in memory and executive function among participants with consistently longer sleep duration. Ma et al. (2020) found a relationship between sleep duration and cognitive performance, with both short and long sleep linked to cognitive deficits. The mechanisms linking oversleeping to cognitive functioning involve alterations in neurotransmitter levels and disruptions in circadian rhythm and sleep pattern (Foster, 2020). Changes in neurotransmitters, such as increased adenosine and decreased dopamine, may contribute to cognitive impairment in individuals with prolonged

sleep patterns (Bishir et al., 2020; Longordo et al., 2009). Understanding this relationship has implications for clinical practice, as clinicians should consider sleep duration when evaluating cognitive complaints (Wennberg et al., 2017).

The previous research worked on the connection between sleep and cognitive functioning. Little work is present on the effects of oversleeping on cognitive functioning, and no work has been done with the mediating role of mental wellbeing, on university students. The present research aims to address this gap in the literature by examining the impact of oversleeping on cognitive functioning and mental wellbeing among university students. Through a comprehensive review of existing literature and empirical investigation, this study seeks to elucidate the mechanisms through which oversleeping may impair cognitive processes such as memory, attention, and executive function. Additionally, it aims to explore the relationship between oversleeping and mental health. Previous studies proved that sleep plays a pivotal role in sustaining cognitive function and promoting mental wellbeing, critical components for academic success and overall quality of life among university students (Tarokh et al., 2016).

Present study investigates the relationship between oversleeping, mental well-being, and cognitive functioning among university students. Mental well-being, frequently overlooked in the daily lives of students, can lead to emotional dysregulation and impact cognitive functioning (Sznitman et al., 2011). Recent and emerging data indicate a key role for sleep in supporting cognitive function and mental well-being in adolescence.

Furthermore, the habit of oversleeping among students may influence cognitive performance, giving rise to challenges such as attentional deficits, lack of self-control, and diminished concentration, thought processing, and other cognitive functions (Dahl & Lewin, 2002). Recognizing the significance of these factors can contribute to the development of interventions and strategies aimed at promoting optimal mental and cognitive health among university students.

By shedding light on the potential consequences of oversleeping, this research article seeks to inform university health services, educators, and policymakers about the importance of promoting healthy sleep habits among students. Ultimately, by identifying the risks associated with oversleeping and its impact on cognitive function and mental wellbeing, this study aims to contribute to the development of targeted interventions aimed at improving the overall health and academic success of university students. While the adverse effects of sleep deprivation on cognitive function and mental health have been extensively studied, the impact of oversleeping, or hypersomnia, remains an underexplored area of research within this demographic. This rationale aims to justify the necessity of investigating the effects of oversleeping on cognitive functioning and mental wellbeing among university students.

Objectives of the Study

- To find out the relationship between oversleeping, mental wellbeing, and cognitive functioning.
- To access the effect of oversleeping on mental wellbeing.
- To access the effect of mental wellbeing on cognitive functioning.
- To explore the mediating role of mental wellbeing on the relationship of oversleeping and cognitive functioning.

Research Hypotheses

H1: Oversleeping, cognitive function, and mental well-being will significantly correlate with each other.

H2: Oversleeping and mental well-being will significantly predict cognitive functioning.

H3: Mental well-being will mediate the relationship between oversleeping and cognitive functioning.

1. Method

Research Design

A correlational research design was used in this study.

Sample

The sample for this study comprised of 359 (male=161, female=198) university students selected through purposive sampling from three universities of Faisalabad i.e., Madina Town University for Women, National Textile University, and Government College Women University. The former university is govt and the latter two universities are private. The universities were selected based on convenience. Sample size measured by 10-times rule method. Most researchers would recommend using sample sizes of at least 200/ 5 or 10 cases per parameter (Kline,2017). In this study, total items or all scale are 25. And according to this rule, 250 sample is enough for this study. The age range of the participants was between 19 and 35 years ($M = 21.51$, $SD = 3.068$).

Inclusion criteria

University students whose age range was between 18-35 years, were included in this study. But only those students who slept for 9 or more than 9 hours for at least one month.

Exclusion criteria

Students whose age was less than 18 and greater than 35, or those who slept for less than 9 hours, were not eligible to participate in this study. And those who were suffering from any sleep disorder were also excluded from study.

Table 1

Demographic Characteristics of Participant (N = 359)

Variable(s)	Categories	f (%)
Gender	Male	161(44.8)
	Female	198 (55.2)
SES	Middle	351 (97.8)
	High	8 (2.2)
Marital Status	Married	40 (11.1)
	Unmarried	319 (88.9)
Educational Level	Intermediate	40 (11.1)
	Bachelor	206 (57.4)
	Master	76 (21.2)
	MPhil	37 (10.3)

Note. f=Frequency of observation, SES=Socio-economic Status.

Instruments

- 1. Demographics** Respondents give their initial information on demographic sheet. It included age, gender, socioeconomic status, marital status, religion, educational level, grades in last semester, occupation or any part-time job, total working hours, total sleeping hours in a day, personal sleep satisfaction, life satisfaction, total hours of mobile using before sleep, any psychological diagnosis.
- 2. Oversleeping.** Oversleeping is measured by the criteria, given by the American Sleep Foundation (2015). It suggests that young adults who slept for 10 or more than 10 hours are over-sleepers (Hirshkowitz et al., 2015). It was measured by a single self-report item in the demographic sheet, as Total sleeping hours.
- 3. The Montreal Cognitive Assessment (MoCA) Zaid Nasreddine**

The Montreal Cognitive Assessment (MoCA) was developed by Ziad Nasreddine in 1996 and is used for screening mild cognitive impairment (Julayanont & Nasreddine, 2017). Urdu version of this scale was used. It contains 10 items related to different domains including attention, memory, language, Visuospatial, concentration, and conceptual thinking, abstraction, delayed recall, orientation. The administration time is typically 15-

20 minutes, and the total score is thirty. A score of 26 or above is considered normal, while a score below 26 indicates cognitive impairment (Nasreddine et al., 2005).

4. *Warwick-Edinburgh Mental Well-being Scale (WEMWBS) Tennant et al*

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) is utilized to assess mental well-being. The WEMWBS was developed by Tennant et al in 2007. WEMWBS comprises fourteen items, all of which address positive mental health. It is a 5-point Likert scale. Urdu version of this scale was used. The minimum score on this scale is fourteen, and the maximum score is seventy. The WEMWBS is a 14-item scale of positively worded statements covering feeling and functioning aspects of mental wellbeing. It has five response categories from 'none of the time' to 'all of the time'. Children and young people are asked to describe their experiences over the past two weeks. The age range specified by the author for the use of WEMWBS is sixteen and above (Stewart-Brown, 2008). Cronbach's alpha coefficient of 0.89 suggests a high level of internal consistency among the items in the scale (Stewart-Brown, 2011).

PROCEDURE

After obtaining permission from the university's ethical review committee, participants were contacted through their respective departments. The departments approached were the Psychology departments of two universities and the fashion designing department, based on convenience. Only over sleepers were selected to participate in research, by asking question about their total sleeping hours first. After selecting over sleepers, the purpose of research described to them briefly. Initially, participants signed informed consent forms. And ensure confidentiality of their data. They were told how their data values for our research, and they are benefiting society by participating in the research. And they have the right to withdraw themselves at any time from research, discontinue, or refuse to fill questionnaire without any penalty. After that, they were provided with the questionnaires. Montreal cognitive assessment scale (used to assess cognitive functioning) was administered by the researcher and her trained research assistant, as it contains some activities-based items. The research assistants were trained before data collection in administering the MoCA test. After the completion of data collection, the participants were appreciated for their participation in research. Data was analysed using SPSS and Mediation analysis was run through AMOS.

2. Results

Table 2

Zero Order Correlations, Mean, Standard Deviation, Reliability, and Normal Distribution for Oversleeping, Cognitive functioning, and Mental Well-Being (N=359)

	TSH	MoCA	WEMWBS	<i>M</i>	<i>SD</i>	α	Skew	Kurt
TSH	----	-.173**	-.372**	10.78	1.84	-	.95	-.090
MoCA		----	.715**	22.72	5.02	0.70	-1.05	.495
WEMWBS			----	51.28	9.30	0.82	-.70	.069

Note. TSH= Total Sleeping Hours, MoCA= Montreal Cognitive Assessment, WEMWBS= Warwick-Edinburgh Mental Well-being Scale, **Correlation is significant at the 0.01 level (2-tailed), *M*=mean, *SD*=standard deviation, α =Cronbach's Alpha, - =reliability cannot be calculated as this is single item-based variable, Skew=skewness, Kurt=kurtosis, *N*=359.

It has been hypothesized that cognitive functioning would significantly relate to mental well-being and oversleeping among university students. Table 2 represents the results indicating the zero-order correlations, means, standard deviations, reliability, and normality statistics. It further explains that the Total Sleeping Hours (TSH) is negatively correlated with both cognitive function (MoCA, $r = -0.173$, $p < 0.01$) and mental well-being (WEMWBS, $r = -0.372$, $p < 0.01$). This finding confirms that longer sleep period relates to poor cognitive functioning and lower mental well-being. MoCA is positively correlated with WEMWBS ($r = 0.715$, $p < 0.01$) which explains that better cognitive functioning is linked to higher levels of mental well-being. The mean of total sleeping hours is 10.78 with $SD = 1.84$, suggesting that on average, participants slept for a relatively long period of time. The mean of total MoCA score is 22.72 with $SD = 5.02$, with a reliability of 0.70, indicating good reliability, also MoCA scores are negatively skewed (-1.05). The mean score of total WEMWBS is 51.28 ($SD = 9.30$), with a reliability of 0.82. The WEMWBS scores have a slight negative skew (-0.70) but overall, the data is normally distributed.

Table 3

Multiple Regression Analyses and Model Fit Values on Cognitive functioning (MoCA) Considering Oversleeping (TSH) and Mental Well-Being (WEBMWS) as Predictors (N=359)

	B	B	t	p	R ²	F	SE	95% CI
TSH	.292	.107	2.713	.007	0.52	193.2	3.84	(0.080, 0.504)
WEMWBS	.407	.754	19.084	.000				(0.365, 0.449)

Note. F=ANOVA value, SE=standard error of the estimates, CI= confidence interval for B

The second hypothesis of this study proposed that oversleeping and mental well-being are the predictors of cognitive function. To test this hypothesis, multiple regression analysis has been employed. The results of the analyses show that both oversleeping ($\beta = .107$, $t = 2.713$, $p = 0.007$) and mental well-being ($\beta = .754$, $t = 19.084$, $p = 0.000$) are significant predictors of cognitive functioning. Concerning model fit, the R^2 value of 0.52 indicates that the predictors collectively explain 52% of the variance in MoCA scores. The ANOVA value (F) of 193.2 is highly significant, suggesting that the model with TSH and WEBMWS as predictors is a good fit for predicting MoCA scores.

The standard error of the estimates is 3.84, indicating the average gap of observed values from the regression line.

Table 4

Mediation Analysis for Mental Well-being (WEMWBS) as a Mediator in the Relationship between Oversleeping and Cognitive Functioning (N=359)

	Estimate	S.E.	p
WEMWBS <— TSH	-.37	.247	.016
MoCA <— TSH	.11	.107	.007
MoCA <— WEMWBS	.75	.021	.009

Note. WEMWBS= Warwick-Edinburgh Mental Well-being Scale, TSH= Total Sleeping Hours, MoCA= Montreal Cognitive Assessment.

For this study, mental well-being was taken as a mediator variable, which explains the relationship between oversleeping and cognitive functioning. The significance of this mediation effect is examined using a structural equation model (SEM) using SPSS 27.0 and AMOS 20, and the results are presented in Table 4. The findings from the SEM analysis indicate that mental well-being acts as a significant mediator in the relationship between oversleeping and cognitive functioning, further analysis related to SEM has been presented in coming tables (table 5, 6).

Table 5

Model Fit Indices Measurement Model of SEM Mediation Analysis Using AMOS

Model Fit Indices	Suggested Value	Obtained Value
CMIN/df	< 3	1
GFI	> 0.90	1.00
NFI	≥ 0.90	1.00
IFI	≥ 0.90	1.00
CFI	≥ 0.95	1.00

Note. CMIN/df=Chi-square divided by degrees of freedom, GFI=Goodness of Fit Index, NFI=Normed Fit Index, IFI=Incremental Fit Index, CFI=Comparative Fit Index

The model fit indices presented in Table 5 indicate an excellent fit of the measurement model for the SEM mediation analysis using AMOS. The CMIN/df value of 1 and it is less than the suggested value of 3, the GFI (Goodness of Fit Index) value of 1.00 exceeds the suggested value of 0.90, the NFI (Normed Fit Index), IFI (Incremental Fit Index), and CFI (Comparative Fit Index) value all meet or exceed the suggested thresholds of 0.90 or 0.95, suggesting the model provides a very good fit to explain the latent relationship among study variables.

Table 6

Analysis of SEM Mediation on Total, Direct and Indirect Effects Using AMOS

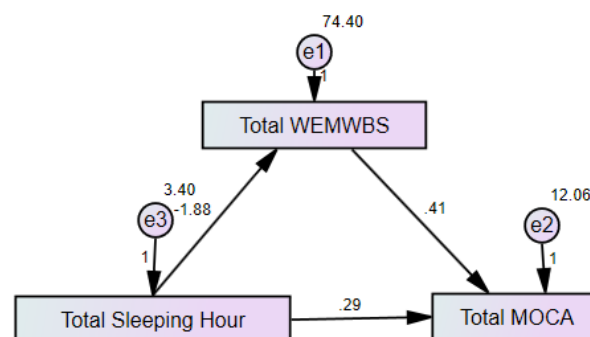
		SE	p-value	Result
Total Effect	WEMWBS <— TSH	-1.88	.013	Significant
	MoCA <— TSH	-.47	.016	Significant
	MoCA <— WEMWBS	.41	.011	Significant
Direct Effect	WEMWBS <— TSH	-1.88	.013	Significant
	MoCA <— TSH	.29	.009	Significant
	MoCA <— WEMWBS	.41	.011	Significant
Indirect Effect	WEMWBS <— TSH	.000	.000	Significant
	MoCA <— TSH	-.76	.012	Significant
	MoCA <— WEMWBS	.000	.000	Significant

Note. WEMWBS= Warwick-Edinburgh Mental Well-being Scale, TSH= Total Sleeping Hours, MoCA= Montreal Cognitive Assessment. SE= Standardized Estimation

The analysis of total, direct and indirect effects is showcasing a significant result that confirms that total sleeping hours has both direct and indirect effect on mental well-being and cognitive functioning, with mental well-being serving as a mediating mechanism between oversleeping and cognitive functioning.

Figure 1

Mental Well-being as a Mediator in the Relationship between Oversleeping and Cognitive functioning.



Note. Figure 1 shows mediational path model for testing the mediational role of mental wellbeing in the relationship between oversleeping and cognitive functioning.

DISCUSSION

The present study aimed to determine the correlation between oversleeping, cognitive functioning, and mental well-being, and explore the predictive role of oversleeping and mental well-being in predicting cognitive functioning. It was hypothesized that there would be a significant correlation among oversleeping, mental well-being, and cognitive function and the result supported this argument and revealed a significant negative correlation between oversleeping and cognitive functioning among university students. The negative association suggests that as oversleeping increases, cognitive functioning tends to decrease. This aligns with previous research indicating that deviations from recommended sleep durations, in both directions, may have implications for cognitive performance (Lin et al., 2023; Nemeskal et al., 2021). The negative correlation emphasizes the importance of maintaining a balanced sleep pattern, avoiding extremes of oversleeping, which may contribute to cognitive deficits. A study conducted by Wickens et al. (2015) also found that both short and long sleep durations were associated with cognitive deficits. Specifically, participants who consistently overslept demonstrated declines in attention, memory, and executive function. Existing literature suggests that an imbalance in sleep duration, including excessive sleep, may negatively impact cognitive performance (Schmidt et al., 2012), prolonged sleep can disrupt circadian rhythms, leading to cognitive impairments (Foster, 2020), irregular sleep patterns, including excessive sleep, can result in diminished alertness and cognitive abilities (Reid et al., 2011), and disruptions to the circadian rhythm are linked to alterations in neurotransmitter levels, influencing cognitive function (Valdez et al., 2012). Oversleeping was also significantly negatively correlated with mental well-being suggesting that as oversleeping increases, mental well-being tends to decline also, underlines the multifaceted nature of oversleeping, affecting not only cognitive aspects but also the broader psychological well-being of university students (Fischer et al., 2020; Fong et al., 2021; Zhang et al., 2017).

The second hypothesis proposed that oversleeping and mental wellbeing would be a significant predictor of cognitive functioning and the results confirmed that argument. It emphasizes the intricate interplay of mental well-being in shaping how cognitive functioning and oversleeping interact. Interventions aimed at improving mental well-being may thus have the potential to mitigate the negative effects of oversleeping on cognitive functioning (Lee et al., 2015; Lin et al., 2023; Tu et al., 2017).

The third hypothesis purposes that mental wellbeing plays a mediating role between oversleeping and cognitive functioning. The structural equation model (SEM) analysis confirmed mental well-being's significant mediating role, providing a nuanced understanding of how mental well-being influences the association between oversleeping and cognitive functioning (Abdullah et al., 2014; Wolfson & Richards, 2011). The results suggest that addressing mental well-being

may not only directly impact cognitive functioning but may also mediate the impact of oversleeping on cognitive outcomes. This underscores the importance of considering mental well-being in interventions targeting cognitive health among university students.

Implications

Oversleeping is not merely a consequence of laziness or a desire for extra rest; it can signify underlying health issues or contribute to a cycle of poor sleep habits and compromised mental health. By investigating the impact of oversleeping on cognitive functioning and mental wellbeing, this research seeks to raise awareness of the potential health risks associated with excessive sleep duration among university students and identify strategies for prevention and intervention. Universities provide various support services to enhance student wellbeing and academic success. However, the effectiveness of these services in addressing oversleeping-related issues may be limited by the lack of empirical evidence. By generating data on the prevalence and consequences of oversleeping, this research can inform the development of targeted interventions and resources tailored to the specific needs of students struggling with sleep-related problems.

The findings of the present research have broader societal implications beyond the university setting. As young adults transition into the workforce, the habits and behaviours established during their university years can significantly influence their long-term health and productivity. By shedding light on the consequences of oversleeping on cognitive functioning and mental wellbeing among university students, this research contributes to the broader discourse on sleep health and its implications for societal wellbeing. In summary, investigating the impact of oversleeping on cognitive functioning and mental wellbeing among university students is not only academically relevant but also holds significant implications for student health, academic success, and societal well-being. By addressing this research gap, we can better understand the complexities of sleep behaviour among university students and develop targeted interventions to support their cognitive and mental health needs.

In summary, investigating the impact of oversleeping on cognitive functioning and mental wellbeing among university students is not only academically relevant but also holds significant implications for student health, academic success, and societal well-being. By addressing this research gap, we can better understand the complexities of sleep behaviour among university students and develop targeted interventions to support their cognitive and mental health needs.

Limitations and Suggestions

This study has several limitations that warrant consideration. Firstly, there should be a comparison group, to enhance the internal consistency of results and to rule out any confounding variables that might decrease cognitive functioning like excessive mobile use, lifestyle, eating

habits etc. And secondly, the sample was drawn from three universities only due to the shortage of time. Additionally, reliance on self-report measures for oversleeping, mental well-being, and cognitive functioning introduces potential response biases. The sample's exclusive focus on university students may limit generalizability to diverse populations. While mental well-being is identified as a mediator, the study does not thoroughly explore potential moderating factors, leaving room for further investigation.

To address these limitations, future research should adopt cross sectional designs to increase internal validity of results. Objective measures should be used to assess cognitive functioning. Expanding the sample to encompass diverse demographic groups beyond university students would broaden the findings' applicability. Furthermore, future studies could probe into potential moderating factors and conduct intervention research to assess strategies aimed at improving mental well-being and cognitive health among university students. As well as future research should involve the sleep quality and nap effect on cognitive functioning.

CONCLUSION

Oversleeping decreases mental wellbeing and cognitive functioning in students. As oversleeping causes poor mental wellbeing. And poor mental wellbeing decreases cognitive functioning. The study uncovered mental well-being's significant mediating role, indicating that addressing mental well-being not only directly influences cognitive functioning but also mediates the impact of oversleeping on cognitive functioning.

REFERENCES

- Abdullah, S., Matthews, M., Murnane, E. L., Gay, G., & Choudhury, T. (2014, September). Towards circadian computing: "early to bed and early to rise" makes some of us unhealthy and sleep deprived. In *Proceedings of the 2014 ACM international joint conference on pervasive and ubiquitous computing* (pp. 673-684).
- Alhola, P., & Polo-Kantola, P. (2007). Sleep deprivation: Impact on cognitive performance. *Neuropsychiatric disease and treatment*, 3(5), 553-567.
- AlDabal, L., & BaHammam, A. S. (2011). Metabolic, endocrine, and immune consequences of sleep deprivation. *The open respiratory medicine journal*, 5, 31.
- Alhola, P., & Polo-Kantola, P. (2007). Sleep deprivation: Impact on cognitive performance. *Neuropsychiatric disease and treatment*, 3(5), 553-567.

- Bishir, M., Bhat, A., Essa, M. M., Ekpo, O., Ihunwo, A. O., Veeraraghavan, V. P., ... & Ojcius, D. M. (2020). Sleep deprivation and neurological disorders. *BioMed research international*, 2020.
- Chattu, V. K., Chattu, S. K., Burman, D., Spence, D. W., & Pandi-Perumal, S. R. (2019, March). The interlinked rising epidemic of insufficient sleep and diabetes mellitus. In *Healthcare* (Vol. 7, No. 1, p. 37). MDPI.
- Coveney, C. M. (2014). Managing sleep and wakefulness in a 24-hour world. *Sociology of health & illness*, 36(1), 123-136.
- Curcio, G., Ferrara, M., & De Gennaro, L. (2006). Sleep loss, learning capacity and academic performance. *Sleep medicine reviews*, 10(5), 323-337.
- Dahl, R. E., & Lewin, D. S. (2002). Pathways to adolescent health sleep regulation and behavior. *Journal of adolescent health*, 31(6), 175-184.
- Durmer, J. S., & Dinges, D. F. (2005, March). Neurocognitive consequences of sleep deprivation. In *Seminars in neurology* (Vol. 25, No. 01, pp. 117-129). Copyright© 2005 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA..
- Fischer, D., McHill, A. W., Sano, A., Picard, R. W., Barger, L. K., Czeisler, C. A., ... & Phillips, A. J. (2020). Irregular sleep and event schedules are associated with poorer self-reported well-being in US college students. *Sleep*, 43(6), zsz300.
- Fong, A., Koh, C. K., Ling, E., Ong, J., Lee, M., & Mithra, S. (2021). What are the Effects of Oversleeping on Students?.
- Foster, R. G. (2020). Sleep, circadian rhythms and health. *Interface Focus*, 10(3), 20190098.
- Gallicchio, L., & Kalesan, B. (2009). Sleep duration and mortality: a systematic review and meta-analysis. *Journal of sleep research*, 18(2), 148-158.
- Hirshkowitz, M., Whiton, K., Albert, S. M., Alessi, C., Bruni, O., DonCarlos, L., ... & Ware, J. C. (2015). National Sleep Foundation's updated sleep duration recommendations. *Sleep health*, 1(4), 233-243.
- Jaggi, P., & Saleem, Z. (2020). Ageing population of Urban India & psychological well-being issues. *International Journal of Social Sciences*, 9(3), 169-184.

- Julayanont, P., & Nasreddine, Z. S. (2017). Montreal Cognitive Assessment (MoCA): concept and clinical review. *Cognitive screening instruments: A practical approach*, 139-195.
- Kapur, R. (2021). Health and well-being.
- Killgore, W. D. (2010). Effects of sleep deprivation on cognition. *Progress in brain research*, 185, 105-129.
- Kline, T. J. (2017). Sample issues, methodological implications, and best practices. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 49(2), 71.
- Kronholm, E., Laatikainen, T., Peltonen, M., Sippola, R., & Partonen, T. (2011). Self-reported sleep duration, all-cause mortality, cardiovascular mortality and morbidity in Finland. *Sleep medicine*, 12(3), 215-221.
- Lee, S. A., Mukherjee, D., Rush, J., Lee, S., & Almeida, D. M. (2024). Too little or too much: nonlinear relationship between sleep duration and daily affective well-being in depressed adults. *BMC psychiatry*, 24(1), 1-10.
- Lee, Y. J., Park, J., Kim, S., Cho, S. J., & Kim, S. J. (2015). Academic performance among adolescents with behaviorally induced insufficient sleep syndrome. *Journal of clinical sleep medicine*, 11(1), 61-68.
- Leibowitz, S. M., Lopes, M. C., Andersen, M. L., & Kushida, C. A. (2006). Sleep deprivation and sleepiness caused by sleep loss. *Sleep Medicine Clinics*, 1(1), 31-45.
- Leng, Y., & Yaffe, K. (2020). Sleep duration and cognitive aging—beyond a U-shaped association. *JAMA Network Open*, 3(9), e2014008-e2014008.
- Lin, J., Xiao, J., Li, Q., & Cao, L. (2023). Association between all-cause mortality and trajectories across quality and duration of sleep and cognitive function: based on Group-Based Multivariate Trajectory modeling. *BMC geriatrics*, 23(1), 528.
- Longordo, F., Kopp, C., & Lüthi, A. (2009). Consequences of sleep deprivation on neurotransmitter receptor expression and function. *European Journal of Neuroscience*, 29(9), 1810-1819.
- Lucas, J. J., & Moore, K. A. (2020). Psychological flexibility: positive implications for mental health and life satisfaction. *Health promotion international*, 35(2), 312-320.

- Ma, Y., Liang, L., Zheng, F., Shi, L., Zhong, B., & Xie, W. (2020). Association between sleep duration and cognitive decline. *JAMA network open*, 3(9), e2013573-e2013573.
- Nasreddine, Z. S., Phillips, N. A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., ... & Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, 53(4), 695-699.
- Nemeskal, C. S., Watrous, J., Raine, L., & Hillman, C. (2021). The Relationship Between Sleep and Cognitive and Physical Health.
- Patel, S. R., Ayas, N. T., Malhotra, M. R., White, D. P., Schernhammer, E. S., Speizer, F. E., ... & Hu, F. B. (2004). A prospective study of sleep duration and mortality risk in women. *Sleep*, 27(3), 440-444.
- Reid, K. J., McGee-Koch, L. L., & Zee, P. C. (2011). Cognition in circadian rhythm sleep disorders. *Progress in brain research*, 190, 3-20.
- Roliz, A. H., & Kothare, S. (2023). The Relationship Between Sleep, Epilepsy, and Development: a Review. *Current Neurology and Neuroscience Reports*, 23(9), 469-477.
- Ryff, C. D. (2013). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and psychosomatics*, 83(1), 10-28.
- Schmidt, C., Peigneux, P., & Cajochen, C. (2012). Age-related changes in sleep and circadian rhythms: impact on cognitive performance and underlying neuroanatomical networks. *Frontiers in neurology*, 3, 118.
- Sivertsen, B., Harvey, A. G., Pallesen, S., & Hysing, M. (2015). Mental health problems in adolescents with delayed sleep phase: results from a large population-based study in Norway. *Journal of sleep research*, 24(1), 11-18.
- Sletten, T. L., Weaver, M. D., Foster, R. G., Gozal, D., Klerman, E. B., Rajaratnam, S. M., ... & Czeisler, C. A. (2023). The importance of sleep regularity: a consensus statement of the National Sleep Foundation sleep timing and variability panel. *Sleep Health*, 9(6), 801-820.
- Stewart-Brown, S. (2012). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): performance in different cultural and geographical groups. In *Mental well-being: International contributions to the study of positive mental health* (pp. 133-150). Dordrecht: Springer Netherlands.

- Stewart-Brown, S. L., Platt, S., Tennant, A., Maheswaran, H., Parkinson, J., Weich, S., ... & Clarke, A. (2011). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): a valid and reliable tool for measuring mental well-being in diverse populations and projects. *J Epidemiol Community Health*, 65(Suppl 2), A38-A39.
- Sznitman, S. R., Reisel, L., & Romer, D. (2011). The neglected role of adolescent emotional well-being in national educational achievement: Bridging the gap between education and mental health policies. *Journal of Adolescent Health*, 48(2), 135-142.
- Tarokh, L., Saletin, J. M., & Carskadon, M. A. (2016). Sleep in adolescence: Physiology, cognition and mental health. *Neuroscience & Biobehavioral Reviews*, 70, 182-188.
- Tu, K. M., Marks, B. T., & El-Sheikh, M. (2017). Sleep and mental health: the moderating role of perceived adolescent-parent attachment. *Sleep Health*, 3(2), 90-97.
- Valdez, P., Ramírez, C., & García, A. (2012). Circadian rhythms in cognitive performance: implications for neuropsychological assessment. *Chronophysiology and therapy*, 81-92.
- Virtanen, M. (2012). *Long working hours and health in office workers: a cohort study of coronary heart disease, diabetes, depression and sleep disturbances* (Doctoral dissertation, UCL (University College London)).
- Wallis, G. B. (2020). *One-dimensional two-phase flow*. Courier Dover Publications.
- Wennberg, A. M., Wu, M. N., Rosenberg, P. B., & Spira, A. P. (2017, August). Sleep disturbance, cognitive decline, and dementia: a review. In *Seminars in neurology* (Vol. 37, No. 4, p. 395). NIH Public Access.
- Wickens, C. D., Hutchins, S. D., Laux, L., & Sebok, A. (2015). The impact of sleep disruption on complex cognitive tasks: a meta-analysis. *Human factors*, 57(6), 930-946.
- Wolfson, A. R., & Richards, M. (2011). Young adolescents. *Sleep and development familial and socio-cultural considerations*, 265-298.
- Wu, J., Cheng, G. H. L., Sheng, L. T., Feng, L., Yuan, J. M., Chee, M., ... & Koh, W. P. (2021). Prospective associations between change in sleep duration and cognitive impairment: Findings from the Singapore Chinese Health Study. *Journal of affective disorders*, 281, 125-130.
- Zhang, J., Paksarian, D., Lamers, F., Hickie, I. B., He, J., & Merikangas, K. R. (2017). Sleep patterns and mental health correlates in US adolescents. *The Journal of Pediatrics*, 182, 137-143.