



Faculty of Cognitive Sciences and Human Development

**THE IMPACT OF SLEEP QUALITY ON THE PSYCHOLOGICAL
WELL-BEING OF MALAYSIAN UNDERGRADUATE STUDENTS**

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**THE IMPACT OF SLEEP QUALITY ON THE PSYCHOLOGICAL WELL-BEING
OF MALAYSIAN UNDERGRADUATE STUDENTS**

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ABSTRACT

The influence of sleep quality on psychological health has been researched worldwide, but less is known about Malaysian university students, particularly on student's mode of commuting. The purpose of the study is to understand the sleep quality and psychological well-being among Malaysian undergraduate students. The sleep quality and psychological well-being of Malaysian undergraduate students are investigated in this study using a cross-sectional approach. Convenience sampling was used to gather data from 110 students who completed an online self-reported questionnaire containing demographic data, Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) and Pittsburgh Sleep Quality Index (PSQI). The relationships are further investigated using statistical methods, Pearson Correlation, Multiple Regression, and Independent Sample T-Test. The study found a weak, significant negative correlation between sleep quality and psychological well-being. There was no significant difference in the quality of sleep between students living on and off campus. On campus, however, students' psychological well-being was much greater. Only subjective sleep quality was shown to be significantly correlated with psychological well-being. The results of the study on undergraduate students in Malaysia show that inadequate sleep harms their psychological well-being and demonstrate how students have normalised bad sleeping patterns. Improving the quality of students' sleep is essential to improving their general well-being.

Keywords: Sleep quality, psychological well-being, subjective sleep quality.

ABSTRAK

Pengaruh kualiti tidur terhadap kesihatan psikologi kurang dikaji dalam kalangan pelajar universiti Malaysia, terutamanya berkaitan cara mereka berulang-alik ke kampus. Tujuan kajian ini adalah untuk memahami kualiti tidur dan kesejahteraan psikologi dalam kalangan pelajar sarjana muda Malaysia. Kualiti tidur dan kesejahteraan psikologi pelajar dikaji menggunakan pendekatan keratan rentas. “*Cvenience sampling*” digunakan untuk mengumpul data daripada 110 pelajar yang melengkapkan soal selidik dalam talian yang mengandungi data demografi, “*Warwick-Edinburgh Mental Well-Being Scale (WEMWBS)*” dan “*Pittsburgh Sleep Quality Index (PSQI)*”. Hubungan ini dianalisa menggunakan kaedah statistik, “*Pearson Correlation*”, “*Multiple Regression*”, dan “*Independent Sample T-Test*”. Kajian mendapati korelasi negatif yang lemah dan signifikan antara kualiti tidur dan kesejahteraan psikologi. Seterusnya, diapati tiada perbezaan signifikan dalam kualiti tidur antara pelajar yang tinggal di dalam dan di luar kampus. Walau bagaimanapun, di dalam kampus, kesejahteraan psikologi pelajar adalah lebih tinggi. Akhir sekali, hanya kualiti tidur subjektif yang didapati mempunyai korelasi yang signifikan dengan kesejahteraan psikologi. Hasil kajian terhadap pelajar prasiswazah di Malaysia mendapati bahawa tidur yang tidak mencukupi menjejaskan kesejahteraan psikologi mereka dan menunjukkan bagaimana pelajar telah menormalisasikan corak tidur yang kurang baik. Peningkatan kualiti tidur pelajar adalah penting untuk meningkatkan kesejahteraan umum mereka.

Kata kunci: Kualiti tidur, kesejahteraan psikologi, kualiti tidur subjektif

CHAPTER ONE

INTRODUCTION

1.0 Introduction

An overview of the relationship between Malaysian university students' psychological well-being and their sleep quality was presented in this chapter. The research background was presented first, followed by the problem statement, objectives, research questions, and hypotheses. The conceptual framework and the significance of the study were also covered in this chapter. The chapter concludes with definitions for key terminologies utilised in this study.

1.1 Background of Study

A vital component of life, sleep is necessary for both the body and the mind to operate correctly. The brain consolidates memories, renew cognitive functions, and replenish the physical and emotional reserves when an individual sleep. In the world of higher education, striving for academic success is excellent, but it frequently costs sleep in the process.

About 10% of adults experience poor sleep quality, making it a common symptom among young adults (Zhai et al., 2018). Voelker (as cited in Zhai et al., 2018) emphasised the disruption of biological sleep cycles in college students because they work late at night on computers to complete assignments and tasks. In addition, undergraduate students' poor sleep quality is caused by environmental noise, academic work, and later bedtimes as a result of social integration demands (Zhai et al., 2018). Thus, it can be said that inadequate sleep is a prevalent issue among college students and that it raises the risk to their mental health.

A person's intellectual and personal development are shaped during the process of pursuing higher education. This journey is characterised for university students by both academic hurdles and the shift to a more independent and self-reliant phase of life. While there are

chances for learning and personal development throughout this transition, there are also a lot of expectations on students' time management skills, academic performance, and stress levels that can negatively affect their well-being.

The general well-being and academic achievement of university students are highly influenced by sleep, which is necessary for both physical and mental health. According to a study by Zhai et al. (2018), getting enough restorative sleep is essential for optimal emotional regulation, stress management, and cognitive function. Moreover, Aronowitz (2018) claims that sleep is when the brain organises memories, digests information, and prepares for the challenges of the next day. The need for good sleep among college students is emphasised, considering the stresses of demanding coursework and requirement to have a balanced lifestyle.

Nonetheless, students frequently struggle to find enough time for sleep due to their academic obligations. According to a study by Chiang et al. (2020), students who struggle to balance their duties may develop a habit of sleep deprivation and irregular sleep schedules as a result of a high workload of assignments, exams, and extracurricular activities.

Furthermore, the context of commuting to campus among college students emphasises on those who prefer to live off campus, away from student housing or other college accommodation. Financial reasons, being close to family, and the lack of on-campus accommodation are some of the factors that impact this decision (Nelson et al.; U.S. Department of Education, as cited in Jamil et al., 2022). According to a study by Nomoto et al. (as cited in Hori et al., 2020), longer commutes appear to be associated with shorter sleep lengths. This is consistent with research conducted in the European Union, which found that commute times have an impact on the daily resting period and frequently result in stress and poorer quality sleep (Dokkedal-Silva et al., 2022). Christian's research (as cited in Dokkedal-Silva et al., 2022) demonstrated a link between the symptoms of insomnia and the length of

commute, which emphasised the detrimental effects of longer commutes on sleep duration. This context emphasised the necessity of investigating the complex interaction among undergraduate students' general well-being, sleep quality, and mode of transportation.

In the context of Malaysian students, a study by Ismail et al. (2021) on the sleep deprivation among medical students in Malaysia found that about 26 (15.9%) out of 118 medical students have difficulty sleeping due to academic demands of medical training and the usage of electronic devices before sleep. The study clarified how sleep deprivation contributed to morning fatigue in students and discovered a notable difference between sleep deprivation and human functioning among medical students concerning alertness and academic performance. Furthermore, 215 out of 256 (84%) of the undergraduate Malaysian pharmacy students in Hanapi et al.'s study from 2021 on the relationship between sleep quality and quality of life had an average of poor sleep quality, which is linked to significantly worse emotional well-being than those who had good sleep quality. Therefore, a crucial concern arises over the quality of sleep that Malaysian students receive.

1.2 Problem Statement

Although there is an expanding literature of international studies analysing how psychological health is affected by sleep quality (Armand et al., 2021; Eleftheriou et al., 2021; Oluka et al., 2019; Zhai et al., 2018), these studies have been carried out in the cultural contexts outside of Malaysia. There is a lack of research in Malaysia, especially from university students, which leaves a significant gap in knowledge of the unique dynamics at work in Malaysia's higher education system.

Since most studies on the connection between psychological well-being and sleep quality among Malaysian university students concentrate on medical and health sciences

students, there is a severe lack of understanding regarding the experiences of students from other undergraduate programmes (Hanapi et al., 2021; Haque et al., 2018). It is important to examine medical and health sciences students because of their demanding academic and clinical responsibilities; nevertheless, concentrating just on this demographic restricts the generalizability of results to a broader group of university students (Haque et al., 2018). Thus, comprehensive studies involving students from a variety of undergraduate programmes are required to acquire a more inclusive understanding of the factors influencing mental health and sleep habits across Malaysia's broad student group.

Malaysian researchers who studied the connection between sleep quality and psychological well-being have used tools such as the DASS-21 (Shahira et al., 2018), SF-36 health survey questionnaire (Hanapi et al., 2021), and Satisfaction with Life Scale (Haque et al., 2018). But there has yet to be any use of the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS). While the existing instruments offer valuable insights into the relationship between psychological well-being and sleep quality, WEMWBS absence from the research field indicates a lack of regularly used and validated measure. When considering both hedonic and eudaimonic components of mental health, WEMWBS offers a holistic perspective. Therefore, studies employing WEMWBS are required to provide a greater understanding of the connection between Malaysian students' psychological well-being and sleep quality.

Furthermore, commuting to and from campus every day is an essential aspect of college life, yet less is known about how it affects psychological health and sleep quality. Even with the increasing number of studies looking at university students' sleep patterns and mental health (Armand et al., 2021; Chiang et al., 2020; Eleftheriou et al., 2021; Farah et al., 2019; Hanapi et al., 2021; Liu et al., 2021; Oluka et al., 2019; Zhai et al., 2018), there is still a research gap about how commutes to campus affect these important aspects of student life. Even though various factors affecting sleep and general health have been studied, there is a clear research

gap when it comes to the unique challenges experienced by students who commute to campus compared to those who do not. The duration of the commute, the mode of transportation, and the challenges associated with it can all have a big impact on how students sleep and function overall.

Lastly, based on the study carried out by Armand et al. (2021), a suggestion for additional academic research was made. More research is required to fully explore the components measured by the Pittsburgh Sleep Quality Index (PSQI) questionnaire. These components, which assess the different aspects of sleep quality, need to be carefully examined to understand their complex effects on the psychological well-being of Malaysian students.

1.3 Research Objectives

1.3.1 General Objective

- To understand the sleep quality and psychological wellbeing among Malaysian undergraduate students.

1.3.2 Specific Objectives

- To investigate the relationship between sleep quality and the psychological well-being among Malaysian undergraduate students.
- To examine the difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia.
- To investigate which sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students.

1.4 Research Questions

RQ₁: What is the relationship between sleep quality and psychological well-being among Malaysian undergraduate students?

RQ₂: Is there a significant difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia?

RQ₃: Which sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students?

1.5 Research Hypothesis

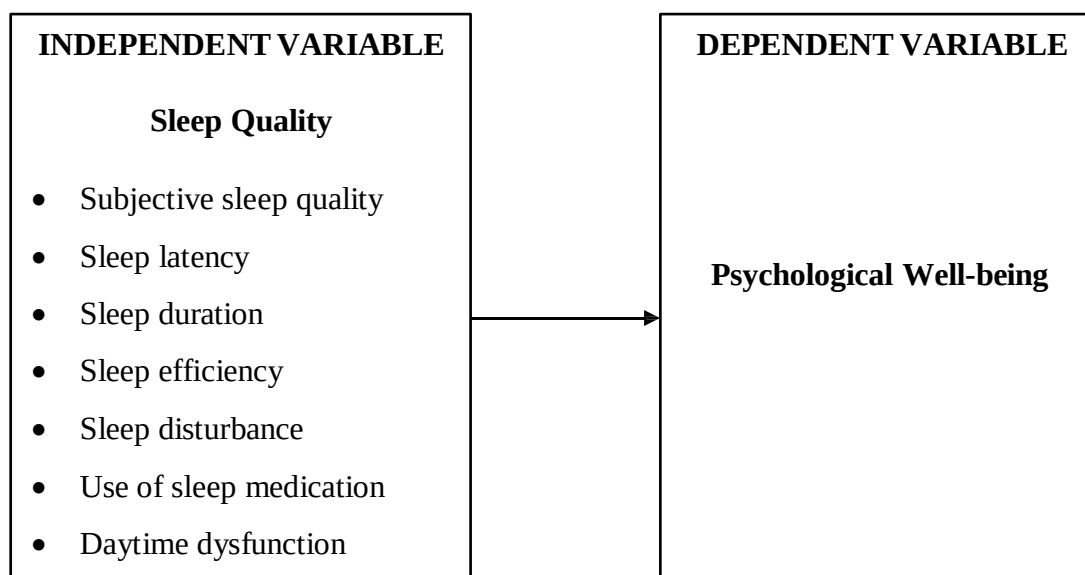
1. There is a significant relationship between sleep quality and the psychological well-being of Malaysian undergraduate students.

2. There is a significant difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia.

3. Certain component of sleep quality is significantly associated with psychological well-being among Malaysian undergraduate students.

1.6 Conceptual Framework

Figure 1: *Conceptual framework of the study*



The dependent variable in the study was psychological well-being, and the independent variable was sleep quality. It implied that the quality of sleep has an impact on psychological well-being.

1.7 Significance of Study

The research addresses a notable gap in the literature by investigating the complex relationship between sleep quality and psychological well-being in Malaysian settings, especially among undergraduate students. To further enhance understanding, a focused analysis of Malaysia's university distinct educational characteristics is required by taking into account the difference in background of Malaysian students from the study made with international students from prior Western studies. Additionally, the study also closed a significant research gap about the effects of commuting to campus on psychological well-being and sleep quality by explaining the distinctive challenges and experiences of Malaysian students. The

study aimed to address mental health issues in educational settings by shedding light on how sleep affects psychological well-being among Malaysian university students as well as contribute to academic practises and to broader discussed about public health and well-being by examining the intricate link between psychological well-being and sleep quality.

1.8 Definition of Terms

1.8.1 Sleep Quality

Conceptual definition:

The term "sleep quality" refers to how satisfied an individual feels with each component of their sleep experience (Nelson et al., 2021). Additionally, sleep efficiency, or the proportion of time spent sleeping, and sleep-related issues, like insomnia and disrupted or fragmented sleep, are also described by sleep quality (Tu et al., 2021).

Operational definition:

In this study, sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The questionnaire was used to examine seven components of sleep quality: subjective sleep quality, sleep latency, duration, efficiency, sleep disruption, use of sleep medication, and dysfunction throughout the day. The results whereby larger scores correspond to lower quality sleep, and lower scores to greater quality sleep.

1.8.2 Psychological Well-being

Conceptual definition:

The concept of well-being encompassed the eudaimonic perspective, which emphasised psychological functioning and self-realization, and the hedonic perspective, which concentrates on an individual's subjective experience of happiness and life satisfaction (Ryan RM and Deci EL, as cited in Tennant et al., 2007).

Operational definition:

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) questionnaire was used in this study to measure psychological well-being. It included items on eudemonic and hedonic well-being and psychological functioning and subjective well-being. Greater psychological well-being is indicated by higher WEMWBS scores, which represents good mental health and general life satisfaction. In contrast, lower scores are associated with lower psychological well-being.

1.9 Summary

The purpose of this study was to investigate the relationship between Malaysian undergraduate students' psychological health and sleep quality. This chapter looks at the problem statement and gives the general context of the study. Next, the study's general and goals, research questions, and hypotheses were discussed. A conceptual framework was also included. Lastly, the significance of the study was thoroughly examined, and key words were defined.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

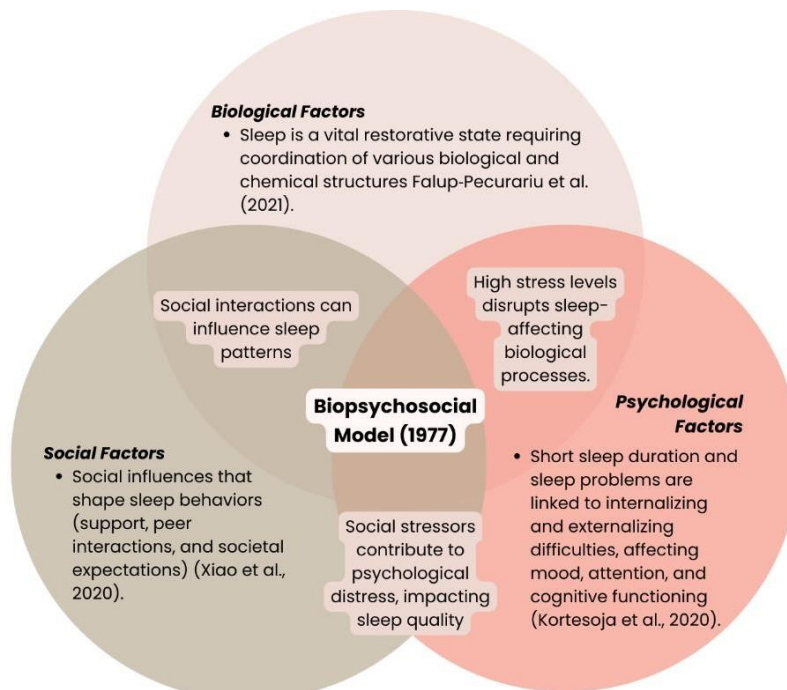
It has been established that getting enough sleep is an essential physiological component of human health. The complex relationship between psychological well-being and sleep quality has been the subject especially focusing on student populations. According to Zhai et al. (2018), getting enough sleep is essential for preserving psychological health because insufficient sleep might raise the possibility of mental health issues like depression and anxiety. Their results demonstrated the powerful effects of inadequate sleep, which outweigh the consequences linked to regular sleep schedules.

2.1 Theory Related to Sleep Quality Effects on Psychological Wellbeing

2.1.1 Biopsychosocial Model

Sleep quality is a multifaceted phenomenon influenced by intricate interactions between biological, psychological, and social factors. In the context of biological factors, the balance of sleep quality, duration, and physiological processes plays an important role. Falup-Pecurariu et al. (2021) have emphasised that sleep is an essential restorative behavioural state that requires precise coordination of multiple biological and chemical systems. This understanding forms the biological foundation of the proposed theoretical framework.

Figure 2: *Biopsychosocial Model of Sleep Quality*



Psychological dimensions further contribute to the understanding of sleep quality, encompassing cognitive processes and emotional regulation. The reciprocal relationship that exists between psychological moods and sleep is highlighted by Kortesoja et al. (2020). Insufficient sleep length and sleep disorders are linked to internalising and externalising challenges, affecting mood, focus, and cognitive abilities.

Social factors are integral components of sleep patterns, as evidenced by Xiao et al. (2020). Social influences, including social support, peer interactions, and societal expectations, shape sleep behaviours. According to Xiao et al. (2020), social capital affects both sleep quality and mental well-being.

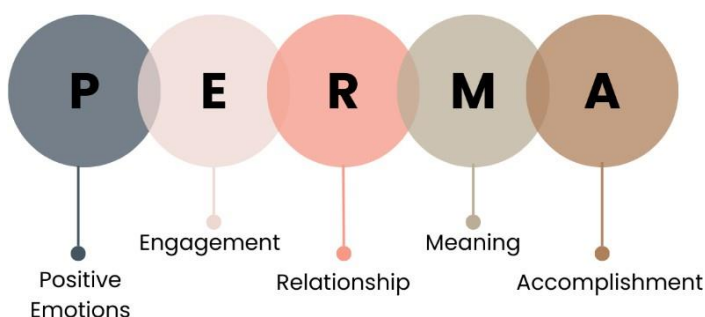
Recognizing the dynamic nature of these factors, the theoretical framework acknowledges correlative influences and feedback loops. Interactions among biological, psychological, and social dimensions creates a system where disturbances in one domain can

affect the others negatively. This recognition underscored the complexity of sleep quality and its multifaceted determinants.

The ultimate outcome of this interplay is reflected in psychological well-being. Armand et al. (2021) provide evidence that disturbances in sleep quality are linked to decreased levels of psychological well-being. Negative affect, mood disorders, and an inverted U-shaped relationship with sleep duration characterize the psychological well-being outcomes associated with poor sleep quality. This outcome layer integrates the biological, psychological, and social dimensions, emphasizing their collective impact on an individual's mental health.

2.1.2 Seligman's PERMA Model

Figure 3: *PERMA Model*



Seligman's theory of well-being combines cognitive happiness (meaning satisfaction), hedonic happiness (meaning feeling), and eudaimonia (meaning meaning). The five variables that predict well-being are accomplishment, purpose, relationships, positive emotions, and involvement. PERMA is the abbreviation for these five components. Every component enhances well-being and can be assessed and characterised independently. A combination of PERMA elements promotes flourishing, which is defined as the best possible functioning of people (Kovich, 2022). Positive emotion includes subjective narratives of happiness, joy, contentment, and optimism. Engagement indicates focus, attention, or complete focus on a job.

Relationships involve closeness and connection with friends, family, and co-workers. Meaning is what gives anything its significance is one's belief in something bigger than oneself, which might come from activism, spirituality, or religion. The final element, Accomplishment, discusses actions taken in life with the goal of "winning" (Kovich, 2022).

In the study conducted by Kovich et al. (2022), it was shown that when the second-order well-being model applied the PERMA model to undergraduate students, accomplishment had the strongest correlation with well-being. This conclusion is particularly important for undergraduate students attending research-intensive universities, where a sense of accomplishment may be linked to future success in the workplace and academic plans. According to theories of psychological and subjective well-being, the study highlights the importance of accomplishment in promoting favourable outcomes and life satisfaction (Bloch-Jorgensen et al. as cited in Kovich et al., 2022). The hedonic and eudaimonic components of Seligman's PERMA model (as cited in Kovich et al., 2022) help people comprehend and move towards optimal well-being in this complex environment.

2.2 Relationship between Sleep Quality and Psychological Well-being

Significant connections were found between sleep quality, mental health, well-being, and educational influence in a recent study by Stores et al. (2023) that focused on university students in the UK. The results showed a high correlation between decreased well-being and sleep disturbances, daytime drowsiness, depression, and anxiety. This study is consistent with previous studies conducted on university students in the United Kingdom (Akram et al.; Sheaves et al., as referenced in Stores et al., 2023), which demonstrated the widespread influence of sleep on several aspects of students' lives.

Moreover, the impact of external factors on sleep quality, as evidenced by Eleftheriou et al. (2021), explained the broader context of sleep and mental health. Their study during the COVID-19 pandemic on medical students highlighted how worries about job and school, along with the pressures of the epidemic, led to greater rates of anxiety, despair, and poor sleep quality. Additionally, the study demonstrated a correlation between high levels of anxiety and depressive symptoms and poor sleep quality, as well as a relationship between high levels of sleeplessness and increased frequency and intensity of burnout.

Similarly, Zhai et al. (2018) looked into how Chinese final-year undergraduate students' psychological health related to their quality of sleep. The findings demonstrated that increased levels of negative mental health were significantly correlated with poorer sleep quality, whereas lower levels of negative psychological well-being were correlated with normal sleep quality.

In a 2021 study, Hanapi et al. looked at the relationship between sleep quality and undergraduate pharmacy students' quality of life in Malaysian environments. The results of the study showed a clear correlation between the emotional well-being domain (which encompasses psychological well-being, anxiety, and depression) and the quality of sleep. These results underscored the need for all-encompassing well-being therapies by emphasising earlier research's emphasis on the detrimental relationships between stress, low quality of life, and poor sleep among college students.

Haque et al. (2018) conducted a study in Malaysia to investigate the correlation between the quality of sleep and the overall well-being of students pursuing Allied Health Sciences. Remarkably, there were no appreciable variations in life satisfaction or sleep quality between Allied Health Sciences programmes, academic years, or gender. It did, however, show a noteworthy correlation showing that higher life satisfaction was associated with higher quality

sleep. This highlighted the critical role that sleep plays in determining students' overall well-being and offered insights unique to Malaysian university settings.

2.3 Sleep Quality and Psychological Well-being Between Students Who Commute to Campus and Students Who Do Not Commute to Campus

According to Villa-González et al. (2019), commuter students are individuals who live off-campus near the school and do not reside in housing maintained by the institution. Even though commuter students and on-campus students are somewhat distinct from one another, they both have similar concerns about the experience of going to college while living away from home. According to Thomas and Jones Villa-González et al. (2019), such concerns include factors like traffic, parking, road conditions, public transportation schedules, and the dangers of going home after dark.

Research by Villa-González et al. (2019) highlighted the difficulties experienced by students who commute, emphasising how hard, expensive, and draining commuting can be—a fact that many students had not previously considered. Students who commute also brought up safety issues related to walking, public transportation, and driving.

Additionally, studies by Lopes et al. (2022) highlighted how living circumstances, such as commuting, affect sleep habits. An earlier wake-up time was found to be linked to longer commutes, which significantly shortened the amount of time people slept overall. Due to the mix of social activities and academic obligations that come with attending college, students were more vulnerable to changes in the sleep-wake cycle (SWC). Because they had to get up earlier for the longer trip, students who commuted from the state capital to a university campus slept for shorter periods of time during the school day (Lopes et al., 2022).

Dockery's (2022) study, which compared the quality of sleep that on- and off-campus students experienced, yielded some intriguing comparative findings. On-campus inhabitants demonstrated more severe sleep efficiency and higher ratings on the sleep hygiene index. While on-campus residents tended to sleep for longer periods, ANCOVA analyses that controlled for anxiety revealed no substantial differences in sleep efficiency, amount of time spent asleep, or sleep hygiene between on- and off-campus residents. Consequently, it is still maintained that there is no variation in sleep outcomes depending on where one lives (Dockery, 2022). Overall, these studies highlight the complex effects that living arrangements and commutes have on college students' sleep habits and general well-being.

2.4 Sleep Quality Components

2.4.1. Subjective Sleep Quality

The first component of sleep quality is subjective sleep quality which is the perceived sleep quality where rating of the sleep quality takes place. According to Hidaka et al. (2020) the term "subjective sleep quality" describes how satisfied a person is with every aspect of their sleep, including their sleep depth and general state of restfulness. Both in men and women, changes in lifestyle habits related to exercise, physical activity, and supertime were substantially correlated with those having poor sleep quality (Hidaka et al., 2020).

2.4.2 Sleep Latency

The second component affecting the quality of sleep is sleep latency, which is how long it takes a person to go from being fully awake to sleeping (Ong et al., 2023). Physical and mental tiredness are major determinants of this component whereby higher levels of fatigue often result in shorter sleep latency. On the other hand, those with poor sleep latency frequently struggle with extended alertness before going to sleep, which may be a sign of underlying sleep

problems or psychological stress (Ong et al., 2023). Prolonged sleep latency also reduces the capacity to maintain sleep, which leads to less restorative and fragmented sleep cycles.

2.4.3 Sleep Duration

The third component affecting the quality of one's sleep is sleep length, or the overall quantity of time spent sleeping (Nelson et al., 2021). Getting enough sleep is crucial for healthy functioning because it gives the body and mind enough time to perform restorative processes. According to Nelson et al. (2021), adults should aim for 7 to 9 hours of sleep every night to keep a good health and well-being. A variety of negative implications including decreased immune system function, decreased cognitive function, and an elevated risk of chronic illnesses have been associated with short sleep duration.

2.4.4 Sleep Efficiency

Sleep efficiency, which assesses the percentage of time spent sleeping in bed, is the fourth component of sleep quality. According to Liu et al. (2021) high sleep efficiency, which reflects a person's capacity to fall asleep fast and stay asleep through the night, is typically seen as an ideal sign of good sleep health. Low sleep efficiency, on the other hand, may indicate problems falling or staying asleep, which might result in prolonged waking while in bed (Liu et al., 2021). Ineffective sleep can be caused by several things, including stress, anxiety, illnesses, and environmental disruptions.

2.4.5 Sleep Disturbance

Sleep disturbance is the fifth component of sleep quality. It is characterised by physiological changes that interfere with the normal cycles of sleep. According to Nelson et al.

(2021), variety of disruptions can have a major effect on the duration and quality of sleep, which is why they are referred to as sleep disturbances. Common physiological reasons include obstructive sleep apnoea. Moreover, external causes are exposure to noise, bright light, and uncomfortable temperatures. Excessive alcohol consumption or caffeine before to bed, and elevated stress levels are among the lifestyle factors that significantly disrupt sleep cycles (Nelson et al., 2021).

2.4.6 Use of Sleep Medication

The usage of sleep medicine, which is frequently used to treat restless nights or trouble falling asleep, is the sixth component of sleep quality (Liu et al., 2021). According to Liu et al. (2021) in the short term, these drugs may help treat acute insomnia by accelerating the beginning of sleep and minimising awakenings during the night. On the other hand, there are risks and negative consequences associated with long-term use of sleep medicine, such as tolerance, dependence, and the possibility of withdrawal symptoms upon stopping the drug.

2.4.7 Daytime Dysfunction

The last component of sleep quality is daytime dysfunction, which results from poor sleep and presents as a range of symptoms such as weariness, loss of motivation, and mood swings (Liu et al., 2021). The more general effects of sleep disorders on a person's everyday functioning are reflected in daytime dysfunction. According to Liu et al. (2021), other than having trouble maintaining emotional stability, those who have daytime dysfunction frequently display irritability, heightened stress reactions, and sensitivity to anxiety and depression.

2.5 Sleep Quality Component That is Significantly Associated with Psychological Well-Being

Study on the impact of sleep disruption on university students' mental health, well-being, and academic performance were carried out in the UK by Stores et al. (2023). The results showed that sleep quality, daytime sleepiness, depression, anxiety and lower levels of well-being were all significantly correlated with each other. Thus, daytime dysfunction seems to be an important component of sleep quality that is associated with psychological well-being among all other components. This might be attributed to students' capacity to handle the social and intellectual expectations associated with university life, which show up as a continuous inability to stay awake during the day or an overwhelming need to sleep from fatigue. This contributes to their rising stress levels, which lower their psychological well-being. Therefore, this underscored how low-quality sleep might impact students' involvement in their studies.

Changing the focus to Malaysia, Haque et al. (2018) explored the connection between Allied Health Sciences students' sleep quality and well-being at a public university. The study found 45% of cohort had poor sleep quality, as indicated by a global sleep quality index (PSQI) rating of more than five. For a considerable number of participants, the overall amount of sleep each night was less than the suggested seven to nine hours illustrating how the component sleep duration scored highest among Malaysian students between the seven components. Gender differences indicated variations in the amount and quality of sleep that men and women get, even if they were not statistically significant. Based on these findings, Malaysian university students must take sleep health seriously and consider the possible effects on their general well-being.

Additionally, Hanapi et al. (2021) examined the connection between the quality of sleep and the overall well-being of Malaysian undergraduate pharmacy students. The study reported an average PSQI global score indicating of poor sleep quality. The PSQI's subsequent

components were assessed: habitual sleep efficiency, sleep length, daytime dysfunction, sleep quality, sleep latency, and sleep disruptions. A noteworthy proportion of the participants reported insufficient sleep duration, accounting for almost 50% of the total, with less than five hours of sleep per night. These results highlight how common poor sleep quality is among Malaysian pharmacy students and how it may affect their general well-being.

2.5 Improvement in Present Study

The current study represented a significant advancement in several important areas for undergraduate research in Malaysia. Firstly, it expanded its scope beyond the traditional emphasis on students studying medicine and health sciences to include undergraduates from a variety of academic programmes. This inclusive approach, which recognised the distinct difficulties and experiences across disciplines, offers a more comprehensive understanding of the connection between psychological well-being and the quality of sleep.

Secondly, the study acknowledged the impact of commuting on students' everyday lives by highlighting the variations in sleep quality and psychological well-being between students who commute and those who do not. This focused investigation highlighted the unique difficulties commuter students have, such as pressures associated with commuting, and explains how their day-to-day experiences may affect their mental and physical health.

Thirdly, the incorporation of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) as an instrument for evaluating psychological well-being in conjunction with the Pittsburgh Sleep Quality Index (PSQI) was a noteworthy methodological advancement. WEMWBS emphasised both hedonic and eudaimonic components, allowing for a more comprehensive assessment of psychological well-being in the Malaysian context. By using this

measure, the study's validity and reliability were improved, which helps to provide a more realistic picture of the intricate connection between sleep quality and psychological well-being.

Finally, the study adds to the knowledge of components of sleep quality that were associated with psychological well-being among Malaysian undergraduate students. Through an exploration of the complexities of sleep quality, the study attempted to identify the PSQI components that are particularly related to psychological health.

2.6 Summary

The literature review explored the complex connection between psychological health and sleep quality, highlighted the importance of sleep, especially for student populations. Theoretically, the biopsychosocial model and Seligman's PERMA model help to explain how biological, psychological, and social factors interact to shape sleep quality and psychological consequences. Research from Malaysia offered distinct perspectives, disclosed the complex relationships between sleep, mental health, and life satisfaction. The research investigated how commuting affects sleep habits, highlighted the difficulties commuter students encounter and their consequences for general well-being. The research addressed knowledge gaps in Malaysia by offering a comprehensive examination of sleep habits and psychological well-being among undergraduate Malaysian students

CHAPTER THREE

METHODOLOGY

3.0 Introduction

To get an accurate understanding and comprehension of what needs to be done for the study, the methodology described the steps taken to carry out the research. This chapter addressed the population and samples, instruments and examined of data and research design.

3.1 Research Design

This study used a quantitative technique to examine how Malaysian university students' psychological well-being affects their sleep quality. According to Mehrad and Zangeneh (2019), quantitative research placed a strong emphasis on cause-and-effect correlations and the utilisation of measurements and observations. Determining and comprehending the meanings associated with independent and dependent variables in a population is the primary objective. This strategy, which is frequently used in surveys and studies, depends on established tools to gather data, which resulted in the production of statistical data (Mehrad & Zangeneh, 2019). In contrast to qualitative approaches, quantitative research generally requires a shorter duration for data collecting and involves bigger sample sizes, which improves efficiency in answering research questions (Mehrad & Zangeneh, 2019). The essence of quantitative research may be found in Bryman's definition, which emphasises quantification in both data collecting and analysis (Mehrad & Zangeneh, 2019).

In this study, a cross-sectional design was employed. Aggarwal and Ranganathan (2019) state that in a cross-sectional study, the investigator simultaneously assess the experiences and outcomes of the participants. Cross-sectional studies can be thought of as offering a “snapshot” of the qualities and frequency of a population at a particular moment in

time. In this way, a cross-sectional design was suitable to be implemented because it aligns with the objectives of this study which makes it possible to take an immediate picture of the variance in sleep quality between students who commute to campus and those who do not. Additionally, a cross-sectional approach to research was appropriate for examining the components of sleep quality that is associated with psychological health because it allows the assessment of the components simultaneously.

3.2 Population & Sample

The target population includes undergraduate students in Malaysia, which is approximately 377, 103 from public universities, institutions and polytechnics (Kementerian Pendidikan Tinggi, 2022). Based on the published table by Krejcie and Morgan (1970), the minimum sample size that were collected for a population of 377,103 undergraduate Malaysians is 384 samples.

This study utilised a non-probability sampling to select a specific group of students according to the level of study which is bachelor's degree. Within the scope of convenient sampling method, because the sample who possessed the criteria of being an undergraduate student will be selected.

3.3 Instruments

A self-reported questionnaire method was used as the research tool in this study. As stated by Hayek et al. (2023), questionnaires based on self-reported responses are frequently used in practical evaluations because they provide a low-cost and effective way to collect data. The current study utilised an established, validated questionnaire to collect data regarding the impact of sleep quality on psychological well-being. The questionnaires utilized for this study

were adapted from previous research which are Pittsburgh Sleep Quality Index (PSQI) and Warwick Edinburgh Mental Wellbeing Scale (WEMWBS). Three sections consisting of Sections A, B, and C were in the survey and the language used was English.

3.3.1 Instrument Structure

Section A: Demographic

The participants' personal and background information were needed for this section. A total of six items were provided in order to collect data about the respondents, covering topics which were age, gender, race, academic year, university, CGPA, socioeconomic status and residential.

Section B: Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989)

Section B consisted of the PSQI questionnaire to evaluate subjective sleep quality over the previous month. The seven components of the PSQI were subjective sleep quality, subjective sleep latency, subjective sleep length, subjective sleep efficiency, sleep disruptions, usage of sleep medicine, and dysfunction during the day. Respondents were required to rate each of the 19 questions using the provided scale. A four-point Likert scale was adopted for this section, ranging from a scale from 0 which meant it was not in the last month, 1 meant less than once a week, 2 meant once or twice a week, and 3 meant three or more times a week. The questionnaire's total score varied from 0 to 21. An overall low quality of sleep was indicated by a score of 5 or above (5-21), while a score of less than five (0-5) indicated good overall quality of sleep.

Table 1: *Four-point Likert Scale Scoring for the seven components of PSQI*

<i>0</i> <i>Not during the past month</i>	<i>1</i> <i>Less than once a week</i>	<i>2</i> <i>Once or twice a week</i>	<i>3</i> <i>Three or more times a week</i>
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Validity and Reliability of Pittsburgh Sleep Quality Index (PSQI):

The Pittsburgh Sleep Quality Index (PSQI) showed strong internal homogeneity in the Buysse et al. (1989) study. A general reliability coefficient (Cronbach's α) of 0.83 was obtained from the seven component scores, indicating a fair degree of internal consistency. This implies that the seven components appropriately evaluated various facets of the general idea of sleep quality. The results indicated that subjective sleep quality have the largest component-total correlation coefficients, measuring at 0.76 and 0.35, respectively, whereas sleep disturbance have the lowest correlation value. The average component-total correlation coefficient for all components was 0.58.

According to the Cronbach's alpha coefficient, the Chinese-language version of the PSQI showed fair reliability in a study by Zhang et al. (2020) that focused on centenarians who lived in communities in Hainan, China. The study emphasised the impact of components, especially medication use and daytime dysfunction, on reliability and construct validation, even though the scale showed an acceptable variance contribution rate when compared to other studies. Deleting these components resulted in an elevated Cronbach's alpha coefficient, suggesting their limited contributions to the scale's overall reliability.

Jia et al. (2018) used data analysis from a broad age range to investigate the PSQI's structural validity. According to the study's findings, the global PSQI scores had a Cronbach's alpha of 0.73 and comparatively strong correlation coefficients across age groups. This provided evidence for the idea that the PSQI's seven components assessed a particular overall construct associated with sleep quality.

Using the Malay version of the PSQI (PSQI-M), Farah et al. (2019) studied the general adult population in Malaysia to assess sleep quality. With a Cronbach's alpha of 0.74, the PSQI-M demonstrated respectable reliability, according to the findings. Most responders fell within the 95% ranges of agreement, according to test-retest reliability. The study found that the PSQI-M is a reliable instrument for evaluating the quality of adult sleep in Malaysia.

Section C: Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007)

The 14-item scale in Section C was intended to evaluate the hedonic and eudaimonic elements of mental health. The WEMWBS asked about the thoughts and feelings that best capture the respondent's experience with each item over the previous two weeks. The scoring of the statements is based on a five-point scale, where: 1 = none of the time; 2 = rarely; 3 = some of the time; 4 = often; 5 = all of the time. The total score, which goes from a minimum of 14 to a maximum of 70, is the sum of the points for each statement. A higher score implied higher degree of subjective well-being.

Table 2: *Five-point Likert Scale scoring of WEMWBS*

<i>1</i> <i>None of the</i> <i>Time</i>	<i>2</i> <i>Rarely</i>	<i>3</i> <i>Some of the</i> <i>Time</i>	<i>4</i> <i>Often</i>	<i>5</i> <i>All of the Time</i>
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Validity and Reliability of Warwick Edinburgh Mental Wellbeing Scale (WEMWBS):

This result from Tennant et al. (2007) found that the Warwick–Edinburgh Mental Well-being Scale (WEMWBS) had a Cronbach's alpha coefficient of 0.89 when it was validated in the United Kingdom. This validation, which involved people 16 years of age and older, was

done to see if the scale's variables could be reduced and to find out how these factors related to each other.

Additionally, by looking at relationships between the WEMWBS and other scales measuring emotional intelligence and overall health, the study by Tennant et al. (2007) assessed the construct validity of the questionnaire. The Short Depression Happiness Scale, the Scale of Psychological Well-Being, the Satisfaction with Life Scale, the Positive and Negative Affect Scale – positive subscale, and the WHO-Five Well-Being Index all showed moderate strength relationships with WEMWBS. Interestingly, these relationships matched those identified between Affectometer 2 thus making reason that based on Affectometer 2, the WEMWBS scale was developed. These findings correspond to the WEMWBS's comprehensive coverage of the hedonic and eudaimonic elements of mental health.

In a Danish population sample, examining the psychometric qualities of the Danish WEMWBS and its simplified version (SWEMWBS) was the goal of a study done by Koushede et al. (2019). The study included many methodologies and comprised 3,508 Danish individuals aged 16-95, including cognitive interviews, confirmatory factor analysis, and measurement invariance assessment. High internal consistency was found for both the initially constructed scale and simplified scales. The (S)WEMWBS, notably, did not show a ceiling effect, indicated that it may be useful for identifying improvements in the population's overall psychological well-being.

Reliability and validity of the seven-item Chinese Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS) were the focus of another investigation by Sun et al. (2019) that was carried out in Hong Kong. A study was done via random telephone call to 1,331 Chinese citizens of Hong Kong who were at least 18 years old. According to the study's

different approaches, the SWEMWBS showed strong validity and reliability for Hong Kong's general Chinese population.

Diyana et al. (2022) investigated the possible connections among university students' psychological well-being, academic performance, and capacity for leading a balanced life in Malaysia. The study used the WEMWBS and discovered a high level of internal consistency, with a Cronbach's alpha of 0.9. The WEMWBS exhibited strong correlations with various measures of mental state and well-being, emphasizing its utility in understanding mental well-being among Malaysian university students.

3.4 Data Collection Procedures

Convenient sampling was used in the first step of the data-collecting phase, with 384 undergraduate students in Malaysia as the target samples. Subsequently, three sections of a self-report questionnaire were issued. Section A (Demographic), Section B (Pittsburgh Sleep Quality Index) and Section C (Warwick Edinburgh Mental Wellbeing Scale). A Likert scale was implemented in the questionnaire's design to collect answers. Participants received the questionnaire through various social media platforms (WhatsApp, Telegram, Instagram) to complete. To guarantee strong data quality, the "Required" setting was enabled for all questions on Google Forms, reducing the possibility of deliberately missing items and data. After data entry, the Social Sciences Statistical Packages' was used analyse the data.

3.5 Ethics

The ethical guidelines and requirements set forth by the scientific and academic communities was strictly followed in this study. Strict measures was placed to protect the participants' confidentiality, anonymity, and privacy. A thorough explanation of the goal of the

research was provided for informed consent. It was made clear that participation in the study is completely voluntary and that participants may discontinue at any time without imposing any penalties. All information gathered were used exclusively for research and presentation of the study's results were done in an anonymised manner with an emphasis on protecting participants' privacy.

3.6 Data Analysis Procedures

Version 28.0 of the IBM Statistical Packages for Social Sciences (SPSS) was utilized to gather and analyse the data obtained from respondents. There are both descriptive and inferential data in the analysis. Tables for the analysis of gathered data were created with SPSS. To sum up, the study examined the demographic information using descriptive analysis and the remaining data using inferential analysis.

3.6.1 Descriptive Data Analysis

The initial phase of the study included a descriptive data analysis to provide a thorough overview of the dataset. This include investigated relationship between sleep quality and the psychological well-being, examined difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus and investigated which sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students. Establishing a fundamental understanding of the sleep quality data was the goal of this phase.

3.6.2 Inferential Data Analysis

Table 3: *Summarization of Inferential Data Analysis*

HYPOTHESIS	SPSS TEST	JUSTIFICATION
1. There is a significant relationship between sleep quality and the psychological well-being of Malaysian undergraduate students.	Pearson Correlation	When determining the direction and strength of a linear relationship between two continuous variables, Pearson correlation was a useful tool which were sleep quality and psychological well-being. Here, it assisted in establishing whether there was a noteworthy relationship between psychological well-being and the quality of sleep.
2. There is a significant difference in sleep quality and psychological well-being between students who commutes to campus and students does not commute to campus in Malaysia.	Independent Sample T-test	When comparing the means of two independent groups—students who commute and those who do not—the independent samples t-test was suitable. This test assisted in determining whether the means of psychological well-being and sleep quality scores between the two groups differed in a statistically significant way.
3. Certain component of sleep quality is significantly associated with psychological well-being among Malaysian undergraduate students	Multiple Regression Analysis	Multiple regression analysis assessed the relationship between multiple independent variables which was sleep quality components and a dependent variable which was psychological well-being. It helps identified which sleep quality components was significantly associated with psychological well-being.

3.7 Summary

In conclusion, the research design adopted for this study encompassed a cross-sectional approach, allowed the examination of Malaysian undergraduate students' sleep quality and psychological well-being at a specific point in time. The target population included Malaysian undergraduate students, and a convenience sampling method was employed to ensure representative samples across undergraduate students in Malaysia. The selected instruments, namely the Warwick–Edinburgh Mental Well-being Scale (WEMWBS) and the Pittsburgh Sleep Quality Index (PSQI), have demonstrated reliability and validity in previous studies. The administration of questionnaires was conducted electronically. Data analysis involved diverse statistical methods, including Pearson Correlation, Multiple Regression Analysis, and Independent Sample T-Test which enabled a comprehensive exploration of Malaysian undergraduate students' psychological well-being and the quality of their sleep.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.0 Introduction

Using both descriptive and inferential statistical methods, the current study intended to investigate many aspects of sleep quality and psychological well-being among undergraduate students in Malaysia. The demographic data of the respondents was shown by descriptive statistics. To fulfil the first objective of investigating the relationship between psychological well-being and sleep quality, Pearson correlation analysis was carried out via SPSS. Independent sample t-test was used to examine the difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia. Lastly, multiple regression was utilised to investigate which sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students. All findings from the three objectives were discussed and justified.

4.1 Demographic Data

Table 4.1: *Table Distribution of Respondents by Demographic Characteristics*

Demographic Information		Respondents (<i>n</i> =110)	
		Frequency	Percentage
Age	19-22 years old	65	59.1
	23-26 years old	45	40.9
	27-30 years old	0	0
	31 years old and above	0	0
Gender	Male	22	20
	Female	88	80
Race	Malay	41	40
	Chinese	19	5.5
	Indian	7	2.7

	Bumiputera Sarawak	70	40.9
	Bumiputera Sabah	38	10.9
Academic Year	Year 1	13	11.8
	Year 2	20	9.1
	Year 3	70	63.6
	Year 4	17	15.5
	Year 5	0	0
University	Institut Pendidikan Guru (IPG)	3	2.7
	Polytechnic Institute	2	1.8
	Universiti Islam Antarabangsa Malaysia (UiAM)	3	2.7
	Universiti Teknologi MARA (UiTM)	15	13.6
	Universiti Malaya (UM)	1	0.9
	Universiti Malaysia Pahang (UMP)	1	0.9
	Universiti Malaysia Sabah (UMS)	1	0.9
	Universiti Malaysia Terengganu (UMT)	1	0.9
	Universiti Malaysia Sarawak (UNIMAS)	80	72.7
	Universiti Putra Malaysia (UPM)	1	0.9
	Universiti Sains Islam Malaysia (USIM)	1	0.9
	Universiti Sains Malaysia (USM)	1	0.9
CGPA	2.49 and below	2	1.8
	2.50-2.99	11	10
	3.00-3.49	32	29.1
	3.50-4.00	65	59.1
Socioeconomic Status	B40	51	46.4
	M40	47	42.7
	T20	12	10.9
Residential	On-campus	59	53.6

Off-campus	51	46.4
	110	100

4.2 Inferential Data (Main Findings)

Result 4.2.1 for Objective 1: To investigate the relationship between sleep quality and the psychological well-being among Malaysian undergraduate students.

Alternative Hypothesis, H₁: There is a significant relationship between sleep quality and the psychological well-being of Malaysian undergraduate students.

Figure 4.2.1: Scatterplot showing The Correlation Between Sleep Quality and The Psychological Well-being of Malaysian Undergraduate Students

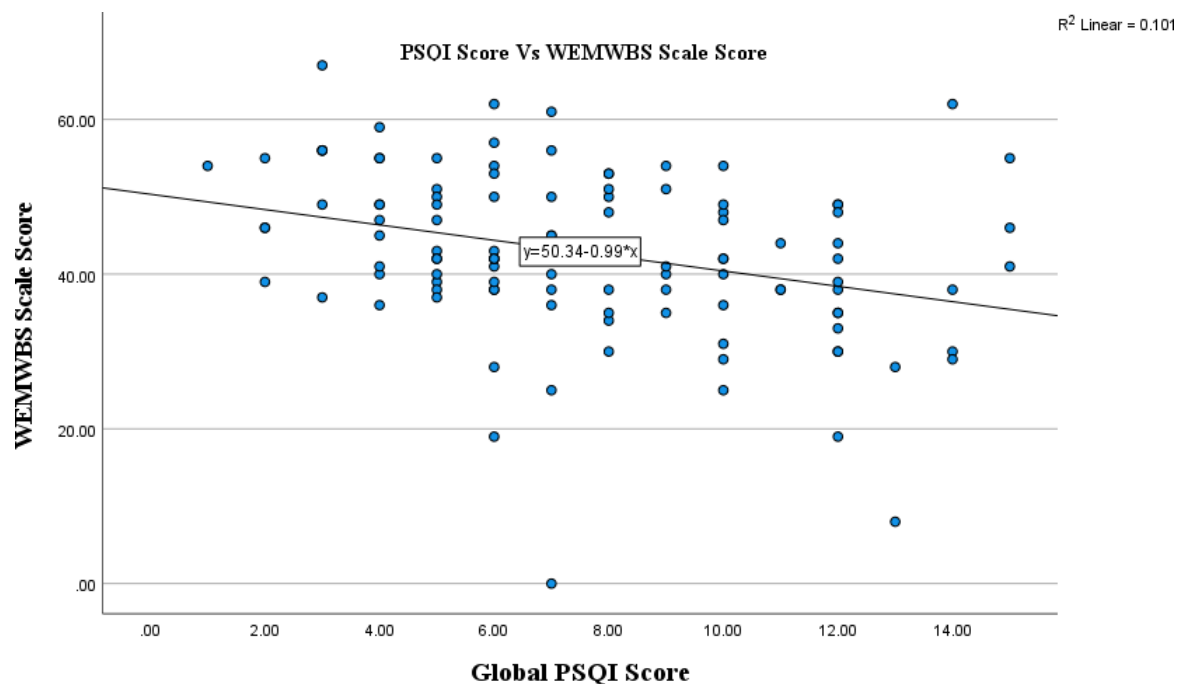


Table 4.2.1: *Pearson Correlation to Investigate the Relationship Between Sleep Quality and Psychological Well-being Among Malaysian Undergraduate Students*

Correlations			
		Global PSQI Score	WEMWBS Scale Score
Global PSQI Score	Pearson	1	-.318**
	Correlation		
	Sig. (2-tailed)		<.001
	N	110	110
WEMWBS Scale Score	Pearson	-.318**	1
	Correlation		
	Sig. (2-tailed)	<.001	
	N	110	199

**. Correlation is significant at the 0.01 level (2-tailed).

Based on Table 4.2.1, a Pearson product-moment correlation was run to determine the relationship between sleep quality and psychological well-being among Malaysian undergraduate students. The data showed there is a weak, negative correlation between sleep quality (PSQI) and psychological well-being (WEMWBS) which was statistically significant ($r = -0.318$, $n = 110$, $p < 0.001$). Negatively correlated means that WEMWBS score is inversely proportional to the PSQI score. The lower the PSQI score, the higher the WEMWBS score will be. Lower PSQI score reflects better sleep quality while higher WEMWBS score means better psychological well-being. This indicates that better sleep quality (lower PSQI scores) is associated with better psychological well-being (higher WEMWBS scores).

Since $p < 0.05$, null hypothesis is rejected. Therefore, there is a significant relationship between sleep quality and psychological well-being among Malaysian undergraduate students. This suggests that among Malaysian undergraduate students, higher scores of sleep quality

were associated with lower psychological well-being, indicating that poor sleep quality may contribute to poorer psychological well-being.

Result 4.2.2 for Objective 2: To examine the difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia.

Alternative Hypothesis, H₁: There is a significant difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia.

Table 4.2.2(a): *Group Statistics Table showing Descriptive Statistics to Compare the On-campus Group and Off-campus Group*

Group Statistics					
	Residential	N	Mean	Std. Deviation	Std. Error Mean
Global PSQI Score	On-campus	59	7.4068	3.63943	.47381
	Off-campus	50	8.1000	3.20236	.45288
WEMWBS Scale Score	On-campus	59	44.9492	10.54289	1.37257
	Off-campus	50	39.9400	10.55483	1.49268

Table 4.2.2(b): *Independent Sample Test Table to Examine the Difference in Sleep Quality and Psychological Well-being Between Students Who Stay In-campus and Students Who Do Not Stay In-campus in Malaysia*

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
Global PSQI Score	Equal variances assumed	.688	.409	-1.046	107	.149	.298	-.69322	.66243	-2.00641	.61996
	Equal variances not assumed			-1.058	106.837	.146	.293	-.69322	.65544	-1.99258	.60614
WEMWBS Scale Score	Equal variances assumed	.006	.941	2.470	107	.008	.015	5.00915	2.02762	.98963	9.02868
	Equal variances not assumed			2.470	104.049	.008	.015	5.00915	2.02781	.98794	9.03036

An independent-samples t-test was run on a random sample of 110 Malaysian undergraduate students to determine if there was a mean difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia. There were 59 students who stayed in-campus and 51 students who stayed off-campus.

Based on Table 4.2.2(a), for sleep quality, the results showed that sleep quality score was lower in the on-campus group (7.407 mean $\pm$ 3.639 standard deviation score) compared to the off-campus group (8.100 mean $\pm$ 3.202 standard deviation score), a mean difference of 0.69 (95% CI, -2.00 to 0.62), $t(107) = -1.046$, $p = 0.298$. According to the Table 4.2.2(b), since the independent t-test p-value is $0.298 > 0.05$, there is not enough evidence to accept alternative hypothesis. There is not a statistically significant mean difference in sleep quality between students who commute to campus and students who do not commute to campus in Malaysia. Therefore, this indicates that staying on-campus or off-campus does not significantly affect sleep quality among Malaysian undergraduate students.

For psychological well-being, the results showed that psychological well-being score was lower in the off-campus group (39.940 mean $\pm$ 10.554 standard deviation score) compared to the on-campus group (44.949 mean $\pm$ 10.543 standard deviation score), a mean difference of 5.001 (95% CI, 0.990 to 9.029), $t(107) = 2.470$, $p = 0.015$. Since the independent t-test p-value is $0.015 < 0.05$, there is enough evidence to accept alternative hypothesis. There is a

statistically significant mean difference in psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia. Thus, this indicates that staying off-campus is associated with lower psychological well-being compared to staying on-campus among Malaysian undergraduate students.

Result 4.2.3 for Objective 3: To investigate which sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students.

Alternative Hypothesis, H₁: Certain component of sleep quality is significantly associated with psychological well-being among Malaysian undergraduate students.

Table 4.2.3(a): *Model Summary Table*

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.475 ^a	.226	.173	9.78952

a. Predictors: (Constant), Daytime Dysfunction, Use of Sleep Medication, Sleep Efficiency, Sleep Disturbance, Subjective Sleep Quality, Sleep Duration, Sleep Latency

Table 4.2.3(b): *ANOVA Table*

ANOVA^a					
Model		Sum of Squares	df	Mean Square	F
1	Regression	2849.552	7	407.079	4.248
	Residual	9775.139	102	95.835	
	Total	12624.691	109		

a. Dependent Variable: WEMWBS Scale Score

b. Predictors: (Constant), Daytime Dysfunction, Use of Sleep Medication, Sleep Efficiency, Sleep Disturbance, Subjective Sleep Quality, Sleep Duration, Sleep Latency

Table 4.2.3(c): *Coefficients Table*

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	53.111	2.826		18.793	<.001	47.506	58.717
	Subjective Sleep Quality	-4.778	1.545	-.330	-3.093	.003	-7.842	-1.713
	Sleep Latency	-1.370	1.139	-.132	-1.203	.232	-3.628	.889
	Sleep Duration	-1.649	1.084	-.158	-1.521	.131	-3.798	.501
	Sleep Efficiency	1.818	1.122	.162	1.620	.108	-.408	4.044
	Sleep Disturbance	.214	1.999	.011	.107	.915	-3.752	4.180
	Use of Sleep Medication	2.802	2.271	.113	1.234	.220	-1.703	7.306
	Daytime Dysfunction	-1.272	1.399	-.094	-.909	.365	-4.047	1.503

a. Dependent Variable: WEMWBS Scale Score

Multiple linear regression was carried out to investigate the relationship between seven sleep quality components which are daytime dysfunction, use of sleep medication, sleep efficiency, sleep disturbance, subjective sleep quality, sleep duration, sleep latency and psychological well-being. The p-value shown in the Table 4.2.3(b) is 0.001 (p-value is $0.001 < 0.05$), which means that the model can be used and is related to psychological well-being.

Based on Table 4.2.3(c), out of all seven components (independent variables), only subjective sleep quality has a significant relationship with psychological well-being whereby p-value = $0.003 < 0.05$. Subjective sleep quality is the personal rating of sleep quality by the participants. Therefore, this reveals that in a Malaysian undergraduate context, subjective sleep quality is the only component that has an association with psychological well-being.

The R Square value in Table 4.2.3(a) was 0.226 so 22.6% of the variation in psychological well-being is not enough to be explained by the model containing daytime dysfunction, use of sleep medication, sleep efficiency, sleep disturbance, subjective sleep quality, sleep duration and sleep latency. It also means that 77.4% of the variation is still unexplained so adding other independent variables could improve the fit of the model.

4.2.4 Summary Findings

Table 4.2.2: *Summary Table of Findings*

OBJECTIVES	HYPOTHESIS	FINDINGS
1. To investigate the relationship between sleep quality and the psychological well-being among Malaysian undergraduate students.	There is a significant relationship between sleep quality and the psychological well-being of Malaysian undergraduate students.	There is a significant relationship between sleep quality and the psychological well-being of Malaysian undergraduate students.
2. To examine the difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia.	There is a significant difference in sleep quality and psychological well-being between students who commutes to campus and students does not commute to campus in Malaysia.	• There is not a statistically significant difference in sleep quality between students who commute to campus and students who do not commute to campus in Malaysia. • There is a statistically significant difference in psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia.
3. To investigate which sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students	Certain component of sleep quality is significantly associated with psychological well-being among Malaysian undergraduate students	Subjective sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students

4.3 Discussion

Discussion 4.3.1 for Objective 1: To investigate the relationship between sleep quality and the psychological well-being among Malaysian undergraduate students.

This study found that most Malaysian undergraduate students have poor sleep quality which then contributes to their low psychological well-being. University students' psychological well-being was found to be negatively correlated with sleep deprivation by Richter and Zhai et al. (as cited in Armand et al., 2021), who concluded that greater levels of negative psychological well-being are associated with lower-quality sleep. In the UK, research also revealed that university students had higher than average rates of disturbed sleep, daytime drowsiness, and decreased well-being when compared to the general population (Stores et al., 2023). In addition, an Indian study found a significant negative association between psychological well-being and poor sleep quality, meaning that the lower the psychological well-being, the worse the sleep quality (Jamal, 2022). Researchers Hanapi et al. (2021) in Malaysia discovered that participants with poor sleep quality reported far lower emotional well-being than participants with high sleep quality.

The results of the study by Zhai et al. (2018) reaffirm the frequency of poor sleep quality among college students as well as the connections between psychological health and sleep quality. For humans, getting enough sleep is essential for good physiological health, but getting too little sleep can have major negative effects on psychological health. Poor sleep will lead to signs of depression and anxiety. The outcome of Zhai et al. (2018) study was statistically significant and in line with research showing how crucial good sleep is for mental health. An additional investigation carried out in a Malaysian setting by Hanapi et al. (2021) supports the findings of the present study, which indicated that participants with inadequate sleep quality experienced significantly worse emotional well-being in comparison to those with adequate sleep quality. Furthermore, research by Haque et al. (2018) on the relationship between well-

being and sleep quality among allied health sciences students at a public university in Malaysia also found a comparable relationship between the two, with a fair negative correlation.

Moreover, the weak, negative correlation obtained in the result might be explained by external factors like the excessive use of social media which is mentioned by the participants. According to research by Khawaja et al. (2023) on medical students in Karachi, many of the students had unrestricted screen usage, depriving them of sleep hours that were crucial. Excessive use of electronics right before bed emits light, which sets off the circadian cycle and makes it difficult to concentrate. In Alonzo et al. (2021) research found that frequent use of social media increased the likelihood of negative mental health outcomes. Furthermore, Park et al.'s research (as cited in Alonzo et al., 2021) examined the moderating effect of depression on the relationship between internet usage and sleep quality, observing that among distressed people, higher internet usage was associated with less sleep problems. In the same way, Tao et al. (quoted in Alonzo et al., 2021) investigated the combined effects of sleep and social media use on teenage mental health outcomes and discovered that the relationship between mobile phone use and poor mental health outcomes had been offset by the quality of sleep.

Other than that, the present study revealed that CGPA serves as a significant predictor of sleep quality scores. Most participants reported a CGPA ranging from 3.50 to 4.00, with academic stress and completing assignments cited as primary reasons for late-night sleeping patterns. This suggests that although participants have poor sleep quality, they still manage to obtain excellent academic achievement. However, previous studies conducted on Malaysian students have revealed a negative correlation between poor sleep quality and lower academic performance whereby poor sleep quality is the cause of academic achievement to be low, indicating that late-night sleep has a negative impact on cognitive function (Hanapi et al., 2021; Ong et al., 2023). According to K. Ahrberg et al. (as cited in Rafi et al., 2021), studying for examinations sometimes necessitates lengthy sessions, particularly late at night, which might

interfere with sleep. Moreover, general stress related to academic performance, deadlines, and workload contributes to anxiety and difficulty sleeping (Lawson et al., 2019). Other than that, a study conducted in Malaysia with health sciences students revealed the difficulties students encounter in balancing their extracurricular and academic obligations, which leaves them with little time to finish assignments to a good standard (Saat et al., 2021). These results highlight the negative impacts of a heavy workload and demanding academic schedule on sleep quality.

Discussion 4.3.2 for Objective 2: To examine the difference in sleep quality and psychological well-being between students who commute to campus and students who do not commute to campus in Malaysia.

This study found no significant difference in the mean level of sleep quality between students living on-campus and off-campus. Students residing on campus are individuals who do not commute to campus, thereby either walking or cycling to class due to living nearby faculties and classes. Meanwhile, students residing off-campus are those who commute to campus utilizing various modes of transportation, including driving cars, riding motorcycles, or utilizing public transportation such as buses. The result went against assumptions and findings of most previous research that found students who commute to campus have poorer sleep quality due to having to wake-up early to go to class.

For instance, Villa-González et al. (2019) categorised students' mode of commuting to school as "active commuters" if they walked or cycled to and/or from school and "passive commuters" if they travelled to and from school by car, motorcycle, bus or train. The study found that young adolescent who met sleep duration recommendations were more likely to be active commuters to school. Another study conducted by Jamil et al. (2022) discovered a statistically significant correlation between commuting time and sleep schedules. Research

indicates that students who travel for longer periods of time have sleep disturbances more frequently than those whose commutes are shorter. Furthermore, research conducted in Malaysia by Saat et al. (2021) discovered that most university students in Malaysia prefer to travel by bus or other forms of transportation. This finding may be related to Malaysia's hot and humid environment, which makes cycling and walking difficult. This survey shows that most students use buses or other forms of public transit to get to campus.

Nevertheless, research has shown that even students living on campus, who do not have to drive or ride on motorcycles to school, also struggled with low sleep quality. Issues about the sleeping environment in residential institutions are the root cause of this problem. Most students voiced worries about their sleeping conditions in the dorms. The noise issue was the major one, encompassing traffic, and neighbourly disturbances. A study by Foulkes et al. (2019) shown that peers have a major effect in the poor quality of sleep that occurs on campus. Peers' presence nonetheless had an impact on sleep quality even in circumstances where they were not the source of disruptions; participants expressed willingness to lose sleep in order to socialise and enjoy themselves with friends. However, it was discovered that their heavy workload and stress from academics were the cause of their troubled sleep.

Nonetheless, despite not failing to obtain a significant difference between in the mean level of sleep quality between students living on-campus who does not commute to campus and off-campus who commutes to campus, the current study found that there is a significant difference in the mean level of psychological well-being between students living on-campus and off-campus. Result obtained revealed that on average, students living on-campus who does not commute to campus have a higher level of psychological well-being compared to students living off-campus who commutes to campus.

There is evidence from studies by Rüger et al. and Sha et al. (as cited in Liu et al., 2022) that longer commutes are associated with lower psychological well-being levels. Studies by Denstadli et al., Higgins et al., Singleton, and Smith (as cited in Liu et al., 2022) showed a correlation between commute satisfaction and shorter commute times impacted by delays and traffic congestion, which in turn affects psychological well-being. This indicates that time duration to commute to campus could be a factor influencing psychological well-being. Ding and Feng's (2022) study revealed a negative relationship between school students' psychological well-being and the amount of time they spend travelling. Long commutes, particularly those lasting more than 20 minutes in cities and 30 minutes in rural areas, were found to have a negative impact on students' academic performance and general well-being.

In terms of mode of transportation, de Geus et al. (quoted in Liu et al., 2022) identified a positive association between bicycle commuting and psychological well-being, while Chng et al. (cited in Liu et al., 2022) found that walkers reported better life satisfaction than vehicle users. Furthermore, research by Glasgow et al., Singleton, and Smith (as referenced in Liu et al., 2022) shows that active commuting is associated with greater commute satisfaction, which in turn increases psychological well-being levels. These results are consistent with a study carried out by Hanapi et al. (2021) who reveals that students who are physically active has higher levels of psychological well-being. These physically active students are students who lives in-campus and actively walk to classes or faculty from their dorms and climbed stairs who are characterized as “active commuters” by Villa-González et al. (2019).

Discussion 4.3.3 for Objective 3: To investigate which sleep quality component is significantly associated with psychological well-being among Malaysian undergraduate students.

In the current study only Component 1, subjective sleep quality appeared to be a significant component associated with psychological well-being. Subjective sleep quality refers to the individual's personal evaluation or perception of their sleep experience. Most respondents (56.4%) in this study subjectively rated their overall sleep quality as 'fairly good', based on their sleep quality in the past month. However, most respondents (80.9%) obtained a score of 5-21 on the PSQI which indicated an overall low sleep quality. This suggested that most of the respondents were not aware that they were experiencing poor sleep quality (Khawaja et al., 2023; Rafi et al., 2021).

The fact that students were unaware of their poor sleeping habits suggests that they have become accustomed to their irregular sleep schedules and have normalised feeling drained and not getting enough sleep in return for meeting academic requirements, studying for exams, and using screens just before bed (Ong et al., 2023; Saat et al., 2021). Previous study conducted among undergraduate students in Kuala Lumpur has also found how most students reported their sleep quality as fairly good overall. Despite that, 60% of students in the study had poor sleep quality (Saat et al., 2021). In a UK study by Stores et al. (2023) found that most students (46%) rated their sleep as 'fairly good' even though most of them (75%) are bad sleepers. Moreover, a study conducted among medical students in Ghana by Lawson et al. (2019) too found that most students (37.3%) rated their sleep quality as 'satisfactory' but 56.2% of students had poor sleep quality.

Students may have a misperception of the real effect of their sleep on their psychological well-being due to the normalisation of bad sleeping habits and inattention to the actual state of their sleep. First factor that students adapted into their routine which causes their

sleep quality to be poor is unregulated screen time and social media use. A study conducted by Khawaja et al. (2023) on medical students in Karachi discovered that most of the students had unrestricted screen time, which deprived them of valuable sleep hours. The light emitted by excessive electronic device use before bed disturbs the circadian rhythm and impairs concentration. This could be the result of their frequent late-night social media checks, which, according to Alonzo et al. (2021), is related to the anxiety associated with "fear of missing out" (FOMO). Sleep quality declines because of the heightened cognitive arousal and screen exposure caused by this excessive use before and after bed (Alonzo et al., 2021).

Second, students have developed bad sleeping habits because of their ongoing academic stress and test preparation. K. Ahrberg et al. (as cited in Rafi et al., 2021) suggested that the pressure to study for exams frequently results in extended study sessions, especially late at night, disrupting sleep. He points out that students who are preparing for exams experience high levels of stress and poorer sleep quality, but that these factors do not correlate with their grades. In addition, anxiety and trouble sleeping are caused by the general stress associated with academic performance, deadlines, and workload (Lawson et al., 2019).

Because of students' lack of knowledge on sleep hygiene practices and ignoring their sleep patterns and cycles, students do not seek assistance or make important modifications, thus, contributes to ongoing stress, which decreases their psychological well-being. Brown et al. and Fischer et al. (as cited in Su and He, 2023) suggests that during university years, individuals often experience more flexible schedules but lack guidance and supervision regarding healthy living practices, leading to erratic sleep patterns and irregular routines that undermine sleep quality. Poor sleep quality fails to alleviate negative emotions in college students, resulting in diminished psychological well-being. Conversely, higher sleep quality facilitates a return to a normal state of mind and may even foster a more positive and healthy mental state (Zhu et al., 2023).

Based on undergraduate students in Malaysia, the only significant factor linked to psychological well-being is subjective sleep quality, according to the current study. Many people are unaware that their poor sleep quality is caused by academic stress and excessive screen time, even though the majority of them rate their sleep as "fairly good." Due to things like uncontrolled screen time and academic obligations, bad sleep habits have become more common, which adds to continuing stress and lowered psychological well-being. The results indicate the need for increased knowledge of sleep hygiene and how it affects mental health, as greater sleep can promote more satisfied, more balanced emotions.

4.4 Conclusion

This study concluded that there was a weak but significant negative association between psychological well-being and sleep quality among Malaysian undergraduate students. Since poor sleep is associated with more prevalent psychological well-being, improving sleep quality may help students' psychological well-being. Although there was not a significant difference in the quality of sleep between on-campus and off-campus students, the on-campus group demonstrated greater psychological well-being. Additionally, the only factor that was substantially associated with psychological well-being was subjective sleep quality, suggesting that students frequently underestimate the quality of their real sleep.

CHAPTER FIVE

LIMITATION, IMPLICATION, RECOMMENDATION AND CONCLUSION

5.0 Introduction

This study explored the complex link between sleep quality and psychological well-being in undergraduate Malaysian students, highlighted important discoveries, study limitations, and suggested for further research. Despite the insightful results, several limitations need were considered. The findings of this study have important implications for improving sleep quality and addressing the difficulties experienced by students who commute and those who do not. Further studies were advised to have a deeper comprehension of the causal connections between psychological well-being and sleep quality.

5.1 Limitations of Study

There were several limitations to the present study that should be taken into consideration when examining the impact of sleep quality on psychological well-being among undergraduate students in Malaysia. Firstly, only 110 participants were obtained, significantly fewer than the targeted sample size of 384. The findings' generalizability may be affected by the small sample size, as a higher sample size would be required to fairly reflect the broad group of Malaysian undergraduate students, which were estimated to number 377,103.

Furthermore, the limitation of the study was the sample's unequal demographic representation particularly gender and university portrayal. Unbalanced gender representation was cause for concern where women made up 80% of participants, while men made up 20%. The significant result between sleep quality and psychological well-being obtained may be due to the higher number of female participants. Although not greatly noticeable, Rafi et al. (2021) noted that females face difficulty in sustaining sleep and frequently take naps throughout the

day, resulted in a slightly poorer quality of sleep than males. Numerous studies have suggested that female students' sleep quality was worse than that of male students due to hormonal changes that impact their sleep cycle. Additionally, female students' higher likelihood of experiencing depression and stress may also contributed to their difficulty falling asleep and woke up multiple times during the night (Haque et al., 2018; Saat et al., 2021).

In addition, there was an unfair representation of university among the participants, since most come from University Malaysia Sarawak (UNIMAS), a single university that might not fully represent the diversity of universities throughout Malaysia. The results cannot be applied to all undergraduate students in Malaysia due to the sample's lack of variation. Varying academic expectations, cultural backgrounds, and support networks for students at different universities may have an impact on sleep quality and psychological health in different ways. Moreover, students' lifestyle and sleep habits might vary at various universities due to differences in extracurricular activities, campus surroundings, and academic schedules. As a result, it is possible that the results of this study, which primarily used data from UNIMAS, is not fairly represented the experiences of students at other Malaysian higher education institutions.

Finally, the use of self-reported measures like the Warwick–Edinburgh Mental Well-being Scale (WEMWBS) and the Pittsburgh Sleep Quality Index raised the risk of response bias because participant responses could be skewed by social desirability biases and subjective interpretations, which could compromise the validity and consistency of the data. These limitations stressed the need to interpret study results with caution and point to areas that should be addressed in future research to improve the dependability of studies looking into the connection between psychological well-being and sleep quality among undergraduate students in Malaysia.

5.2 Implications

The complex association between sleep quality and psychological health among Malaysian undergraduate students showed crucial consequences for students' general well-being and academic achievement countrywide. The study's findings showed implications that were needed to take place by administrators at universities, policymakers, and even students themselves.

Firstly, the results highlighted how crucial it was to address the intricate connection between Malaysian undergraduate students' psychological well-being and sleep quality. Along with the study's finding on undergraduate students' poor sleep quality, the current study also showed that students were unaware that their poor sleep was caused by their adaptation of poor sleeping habits. This underscored the need to guide students by holding programs that emphasizes the value of getting enough sleep and stress effective time management techniques that work with their academic schedules to raise awareness of poor sleeping habits and support students' psychological well-being.

Furthermore, the study compared the psychological well-being and sleep quality of commuter and non-commuter students sheds light on the difficulties encountered by both groups. Living off campus was significantly linked to lower psychological well-being due to the long commute and time it takes to get to campus. Thus, these students need specialised support in their academic schedules to properly address their mental health needs. For example, class schedules should be adjusted to ensure that students get enough sleep before facing long commutes and time to get to class, as this may help promote psychological well-being.

5.3 Conclusion

In summary, this study clarified the complex connection between Malaysian undergraduate students' psychological well-being and their sleep quality. The results showed a negative correlation between psychological well-being and sleep quality, suggesting that the higher the sleep quality score, the lower the psychological well-being score which meant that better sleep is linked to better psychological health. This underscored the need of treating sleep-related problems in order to enhance general well-being.

The study also investigated how student's commuting mode affects sleep quality and psychological well-being. The quality of sleep did not significantly differ between students who lived on campus and those who had to commute, in contrast to previous studies. This new discovery challenged presumptions on how commuting mode affects sleep habits due to different circumstances that both groups faced. Nonetheless, the study discovered a significant difference in psychological well-being of students who do not commute to campus and those who commute. The finding of the study showed that students who commute to campus have a lower psychological well-being than those who do not which supports most studies that commuting length and duration significantly affects student's psychological well-being.

The study also explored the components of sleep quality that is significantly related with poor psychological well-being. Subjective sleep quality was found to be the only significant component of sleep quality that is associated with psychological well-being throughout the study. The data analysis shows that even while students perceived their overall sleep quality to be "fairly good," they were unaware of their poor sleep quality. This result highlighted how poor sleep habits has become a norm for university students which solidified the need to address multiple aspects that negatively affects sleep quality in order to support Malaysian undergraduate students' general psychological well-being.

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