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The Relationship Between Screen Time and Sleep Quality Among UNIMAS Undergraduate  
Nursing Students

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This project is submitted in partial fulfilment of the requirements for the degree of  
Bachelor of Nursing with Honours

Faculty of Medicine and Health Sciences  
UNIVERSITI MALAYSIA SARAWAK

## DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.



.....

Signature

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## ABSTRACT

Excessive screen time is becoming increasingly common among university students and has been linked to poor sleep outcomes. Prolonged exposure to electronic devices, especially before bedtime, can negatively affect sleep patterns and overall sleep quality. University students, particularly those in health-related programs, are at increased risk of sleep disturbances due to academic pressure and digital dependency. This study aimed to determine the screen time and sleep duration and to examine the relationship between screen time and sleep quality among undergraduate nursing students at Universiti Malaysia Sarawak (UNIMAS). A cross-sectional study was conducted among 163 undergraduate nursing students recruited through random sampling. A self-administered questionnaire was used, comprising three sections: sociodemographic data, screen time usage, and sleep quality. Data were analysed using IBM SPSS Statistics version 27. Descriptive statistics summarized screen time and sleep quality, while Spearman's correlation and the Mann-Whitney U test were used to assess the relationship and group differences. The results showed that most students reported moderate to high screen time, with an average daily usage of 14.75 hours. The Pittsburgh Sleep Quality Index (PSQI) indicated that a large proportion of respondents experienced poor sleep quality. Spearman's correlation revealed no significant relationship between total screen time and PSQI global score ( $\rho = .041$ ,  $p = .606$ ). Similarly, the Mann-Whitney U test showed no significant difference in screen time between students with good and poor sleep quality ( $p = .604$ ). In conclusion, although screen time and poor sleep quality were both prevalent among UNIMAS undergraduate nursing students, screen time was not significantly associated with sleep quality. Nonetheless, the high prevalence of both highlights the need for health education initiatives focusing on improving digital habits and sleep hygiene among university students.

*Keywords:* relationship, screen time, sleep duration, sleep quality, nursing students

## **ABSTRAK**

Masa skrin yang berlebihan semakin menjadi kebiasaan dalam kalangan pelajar universiti dan telah dikaitkan dengan kualiti tidur yang rendah. Pendedahan berpanjangan kepada peranti elektronik, terutamanya sebelum waktu tidur, boleh memberi kesan negatif terhadap corak tidur dan kualiti tidur secara keseluruhan. Pelajar universiti, khususnya dalam bidang berkaitan kesihatan, berisiko tinggi mengalami gangguan tidur disebabkan oleh tekanan akademik dan ketergantungan terhadap teknologi digital. Kajian ini bertujuan untuk menentukan masa skrin dan tempoh tidur serta mengkaji hubungan antara masa skrin dan kualiti tidur dalam kalangan pelajar jurusan kejururawatan di Universiti Malaysia Sarawak (UNIMAS). Kajian keratan rentas ini melibatkan 163 orang pelajar kejururawatan prasiswazah yang dipilih melalui persampelan rawak. Pengumpulan data menggunakan soal selidik yang merangkumi tiga bahagian: demografi, penggunaan masa skrin, dan kualiti tidur. Data dianalisis menggunakan IBM SPSS Statistics versi 27. Statistik deskriptif digunakan untuk meringkaskan masa skrin dan kualiti tidur, manakala ujian Korelasi *Spearman* dan Ujian *Mann-Whitney U* digunakan untuk menilai hubungan dan perbezaan antara kumpulan. Hasil kajian menunjukkan bahawa majoriti pelajar melaporkan masa skrin yang sederhana hingga tinggi dengan purata penggunaan harian sebanyak 14.75 jam. Skor *Pittsburgh Sleep Quality Index* (PSQI) menunjukkan sebahagian besar responden mengalami kualiti tidur yang rendah. Ujian Korelasi *Spearman* menunjukkan tiada hubungan yang signifikan antara jumlah masa skrin dengan skor global PSQI ( $\rho = .041, p = .606$ ). Begitu juga, ujian *Mann-Whitney U* menunjukkan tiada perbezaan yang signifikan dalam masa skrin antara pelajar yang mempunyai kualiti tidur yang baik dan yang kurang baik ( $p = .604$ ). Kesimpulannya, walaupun masa skrin yang tinggi dan kualiti tidur yang rendah adalah perkara biasa dalam kalangan pelajar kejururawatan UNIMAS, tiada hubungan yang signifikan antara masa skrin dengan kualiti tidur ditemui. Namun begitu, prevalens kedua-dua isu ini menunjukkan perlunya inisiatif pendidikan

kesihatan yang memfokuskan kepada amalan digital yang sihat dan penjagaan kebersihan tidur dalam kalangan pelajar universiti.

*Kata kunci:* hubungan, masa skrin, tempoh tidur, kualiti tidur, pelajar kejururawatan

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## **LIST OF ABBREVIATIONS**

FMHS	Faculty of Medicine and Health Sciences
HELENA	Healthy Lifestyle in Europe by Nutrition in Adolescence
PSQI	Pittsburgh Sleep Quality Index
UNIMAS	Universiti Malaysia Sarawak
SPSS	Statistical Package for the Social Science

# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

This chapter outlines the study's background, problem statement, research questions, research objectives, hypotheses, significance of the study, and concludes with operational definitions of key terms.

### 1.1 Background of the study

One factor that has been progressively linked to poor sleep quality is extended screen time, especially during the period just before going to bed. Screens produce blue light with shorter wavelengths, which promotes wakefulness in the morning but has the same effect at night. Watching exciting shows, playing intense games, or viewing frightening movies can stimulate the release of adrenaline during nighttime, while the production of dopamine, which can encourage addictive behavior, further inhibits the release of melatonin, the hormone that controls sleep (Nizamuddin et al., 2021).

Sleep is an essential function that develops across human lifespan. Cognitive, mental, and physical health all depend on getting enough restorative sleep. The circadian drive to sleep and homeostatic sleep pressure regulate sleep (Hartley et al., 2022). Adequate quality of the sleep-wake cycle and ideal timing are critical for effective functioning in our roles at work and home (Dijk & Archer, 2009). When both processes are in sync and working properly, adults can achieve prolonged, consolidated periods of wakefulness during the day and prolonged, consolidated sleep episodes at night (Kim et al., 2022). However, nursing students

who have significant academic and clinical obligations are particularly prone to the negative effects of inadequate sleep quality. Adequate sleep plays a crucial role in improving cognitive functions, especially regarding memory retention. Inadequate nighttime sleep and excessive daytime sleepiness adversely affect students' physical, cognitive, and academic well-being (Maheshwari & Shaukat, 2019). Therefore, in order for nursing students to maintain their academic and professional competencies, it is vital that they get sufficient amounts of good quality sleep.

This research aims to explore the connection between screen time and sleep quality among undergraduate nursing students at Universiti Malaysia Sarawak (UNIMAS). By examining screen usage patterns and evaluating their effects on sleep, the study's results could guide interventions to enhance sleep hygiene and encourage healthier screen habits among nursing students.

## **1.2 Problem statement**

Nursing students rely significantly on digital devices for many academic activities, including attending lectures, studying, and conducting research. As a result, screen time has become an inevitable and necessary element of their daily routines. While these gadgets are essential for learning and communication, excessive screen time can impair sleep quality and patterns, particularly at night. Late-night screen exposure is particularly troubling since it alters the circadian cycle, resulting in delayed sleep onset and shorter sleep duration (Sahu et al., 2024).

Poor sleep quality has significant consequences for nursing students, who deal with considerable academic and clinical demands. Sleep deprivation impacts cognitive functions like concentration, memory, and decision-making, all of which are crucial for academic achievement and clinical competence. Furthermore, disrupted sleep can lead to increased stress and fatigue, which further hinders their performance in clinical settings and could negatively affect the quality

of patient care (Thomas et al., 2017). These challenges are especially concerning for nursing students as their role requires high attentiveness and precision.

Blue light emitted by screens is one of the main contributors to sleep disruptions. This type of light decreases melatonin production, a hormone that governs the sleep-wake cycle, leading to disturbances in normal sleep patterns (Hartley et al., 2022). Additionally, nursing students often find it difficult to limit their screen time due to academic and social commitments. This excessive screen usage can result in poor sleep, fatigue, and increased stress levels. Consequently, their overall health and performance may decline, making this a critical area for management and intervention (Sahu et al., 2024).

Although the impact of screen usage on sleep has been well documented, there has been limited research, especially on nursing students. Most studies focus on the general student population, ignoring the unique challenges that nursing students encounter due to their intense academic schedules and clinical duties. This research aims to fill that gap by looking into the relationship between screen time and sleep quality among nursing students, giving vital insights to improve their well-being and academic performance.

### **1.3 Research question and Research objectives**

#### **1.3.1 Research Questions**

1. What is the screen time among UNIMAS undergraduate nursing students?
2. What is the sleep duration among UNIMAS undergraduate nursing students?
3. Is there any relationship between screen time and sleep quality among UNIMAS undergraduate nursing students?

#### **1.3.2 General Research Objectives**

The general aim of this study is to examine how screen time habits impact the sleep quality of nursing students.

### 1.3.3 Specific Research Objectives

1. To determine the screen time among UNIMAS undergraduate nursing students.
2. To assess the sleep duration among UNIMAS undergraduate nursing students.
3. To examine the relationship between screen time and sleep quality among UNIMAS undergraduate nursing students.

## 1.4 Hypotheses

**Null Hypothesis:** There is no significant relationship between screen time and sleep quality among UNIMAS undergraduate nursing students.

**Alternative Hypothesis:** There is a significant relationship between screen time and sleep quality among UNIMAS undergraduate nursing students.

## 1.5 Significance of the study

This study is crucial for understanding the relationship between screen time and sleep quality among nursing students, who often face unique academic and clinical demands. By examining the amount of time nursing students spend on screens, the research offers insights into their daily habits, particularly regarding the balance between academic and recreational screen use. This information is vital, as excessive screen time, especially during late hours, can disrupt sleep patterns by interfering with melatonin production and circadian rhythms. This disruption can lead to difficulties in both falling asleep and staying asleep (Hartley et al., 2022).

Assessing sleep duration provides a clear picture of whether nursing students have good or poor sleep quality. Adequate sleep is essential for mental and physical health and influences cognitive functions such as concentration, memory, and decision-making, all of which are critical to academic and clinical performance (Desai et al., 2024). Poor sleep can lead to increased fatigue, stress, and errors in clinical practice, potentially compromising patient care quality (Benjamin et al., 2024).

This study's findings could aid in developing guidelines and interventions aimed at helping nursing students reduce their screen time before bedtime, thus promoting better sleep hygiene. Recommendations include limiting screen use in the evening, using screen filters, and establishing consistent sleep schedules to enhance sleep quality and overall well-being (Sahu et al., 2024).

This research adds to the existing literature by explicitly focusing on nursing students, a group that has not been extensively studied about screen time and sleep. While many studies examine these issues in general student populations, nursing students experience unique stressors that make them a significant group to investigate (Benjamin et al., 2024). By highlighting these specific challenges, the findings can help inform targeted interventions and establish a foundation for future research.

## 1.6 Operational definitions key terms

**Table 1.1**

*Conceptual and Operational Definition of Key Terms*

<b>Terms</b>	<b>Conceptual Definition</b>	<b>Operational Definition</b>
Screen time	Screen time is defined as the duration of time spent looking at an electronic device with a screen, which can include a computer or a television (Merriam-Webster, 2023).	<ul style="list-style-type: none"> <li>In this study, screen time is defined as the total amount of time nursing students spend using electronic devices, such as smartphones, laptops, and tablets, for academic tasks, and recreational activities. It will be measured using the Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) Screen-time</li> </ul>

		<p>Based Sedentary Behaviour Questionnaire adopted from (Rey-López et al., 2011).</p> <ul style="list-style-type: none"> <li>• 6-point Likert scale will be used ranging from: 0= Never, 1= <math>\leq</math> ½ hour, 2= ½-1 hour, 3= 1-2 hours, 4= 2-3 hours, 5= 3-4 hours, 6 = <math>\geq</math>4 hours.</li> </ul>
Sleep quality	<p>Sleep quality is defined as a person’s satisfaction with their sleep experience, considering factors like sleep initiation, maintenance, quantity, and wakefulness (Nelson et al, 2022).</p>	<ul style="list-style-type: none"> <li>• In this study, sleep quality refers to how well nursing students sleep, including sleep duration, how quickly they fall asleep, and how often they wake up during the night. It will be measured using the Pittsburgh Sleep Quality Index (PSQI) adopted from Buysse et al. (1989) that have nine self-rated questions that generate seven component scores.</li> <li>• Total PSQI score is calculated by summing the scores from all the components and minimum total score is 0 while maximum total score is 21. To interpret, a total score <math>&lt;5</math> indicates good sleep quality and <math>&gt;5</math> indicates poor sleep quality.</li> </ul>

Undergraduate nursing students	An undergraduate nursing student is defined as an individual who is currently enrolled in a university's Bachelor of Nursing program, where they are receiving academic and practical training to become professional nurses (Law Insider, 2023).	<ul style="list-style-type: none"> <li>• In this study, UNIMAS undergraduate nursing students are individuals enrolled in Universiti Malaysia Sarawak's Bachelor of Nursing Program.</li> </ul>
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## 1.7 Summary

This study explores how screen time affects sleep quality among UNIMAS undergraduate nursing students. Nursing students rely on screens for academic and personal activities, but excessive use, especially at night, can disrupt sleep. Poor sleep quality can negatively affect their educational and clinical performance. Given the scarcity of research on this topic specifically aimed at nursing students, the purpose of this study is to fill that gap and offer valuable insights into how to improve their sleep and overall health.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter looks at studies about screen time and sleep quality, particularly how they affect university students. The review looks at important ideas like how much time students spend on screens, how long they sleep, and how screen time affects the quality of their sleep. This review relies on articles sourced from reputable databases such as PubMed, Google Scholar, and ResearchGate. The literature covers the last ten years, from 2015 to 2025, to stay current and relevant.

#### 2.1 Screen Time among Students

The amount of screen time among students has increased significantly in recent years, mainly due to the growing use of technology in education and social interactions. A study by Sahu et al. (2024) found that medical and nursing students reported a median screen time of 260 hours over 28 days, with a substantial portion of this time devoted to non-academic activities. This finding aligns with broader trends seen in various studies, indicating that students often spend long hours on screens, primarily for entertainment, social media, and academic purposes. As students increasingly rely on digital devices for learning and communication, concerns have risen regarding the potential health effects of excessive screen exposure.

A study conducted in Karachi highlights a significant concern regarding screen time among college and university students. It shows that the use of screen devices, including mobile phones, computers, and televisions, has drastically increased, especially over the past two decades. The research indicates that students spend excessive time on screens, with many engaging in more than two hours of screen time daily. Specifically, the study found that students who exceed two

hours of screen time on weekdays are 4.23 times more likely to experience poor sleep quality compared to their peers who spend less time on screens (Nizamuddin et al., 2021). This trend reflects a broader pattern observed in numerous educational settings, where students increasingly rely on digital devices for both academic and leisure activities.

The study conducted by Baby et al. (2021) offers valuable insights into the screen time habits of college students, specifically comparing medical and engineering students. The research revealed that smartphone screen time among medical students varied between 1.5 and 15.1 hours per week, with a median of 5.25 hours. In contrast, engineering students had higher screen time, ranging from 3.0 to 13.5 hours per week, with a median of 8 hours. This suggests that engineering students engage more frequently with their devices, likely reflecting their academic demands and lifestyle choices. The prevalence of high screen time among students is concerning, as it often correlates with increased use of social media, gaming, and other digital activities that can extend late into the night. The study highlights that the time-consuming nature of media consumption can disrupt students' regular sleep schedules, especially since media use often peaks just before bedtime.

A study conducted by Mohd Kamaruzihan and Soe (2023) in Kuantan, Malaysia, specifically at the Kulliyah of Pharmacy, International Islamic University Malaysia (IIUM), found that the average screen time among participants was 5.5 hours per day. Additionally, a significant percentage of respondents reported engaging in excessive screen time, exceeding 12 hours daily. These findings are consistent with other studies that have documented high screen time among university students, often attributed to academic requirements, social media use, and entertainment (Yeluri et al., 2020).

The study conducted by Ramesh et al. (2020) in Melaka-Manipal Medical College offers valuable insights into the screen time habits of medical students. The research reveals that all participants used screens before bed, although the duration and types of activities varied. The

study categorized screen time into two main types: interactive and passive. It found that interactive screen time, such as social media use and gaming, was prevalent among students. This trend aligns with broader observations in student populations, where there is an increasing reliance on digital devices for academic and recreational purposes. The findings suggest that screen time has become a common part of students' daily routines, which may affect their overall health and well-being.

## **2.2 Sleep Duration among Students**

Sleep duration among students significantly impacts their overall health and academic performance. A study by Sahu et al. (2024) used the PSQI to assess sleep quality and found that a substantial portion of participants (42.2%) reported poor global sleep quality. Although the study did not provide specific data on average sleep duration, existing research indicates that many students do not get the recommended 7-9 hours of sleep per night, often due to academic pressures and lifestyle choices. The combined effects of excessive screen time and insufficient sleep can have a variety of negative health consequences, including cognitive decline and increased stress.

The findings from the Karachi study by Nizamuddin et al. (2021) indicate that the mean total sleep duration among students is approximately 6.7 hours, which is below the recommended amount for young adults. Alarming, 71% of the participants reported experiencing poor sleep quality, highlighting that many students are not achieving sufficient restorative sleep. This lack of adequate sleep can significantly impact students' academic performance, mental health, and overall well-being. The study emphasizes the need for further investigation into students' sleep habits, as insufficient sleep can result in daytime sleepiness, decreased alertness, and impaired cognitive function.

The research by Baby et al. (2021) indicates that screen time has a significant impact on the sleep duration of students. Although the study did not provide specific details about the average

sleep duration reported by participants, it revealed that a large number of students experienced disturbed sleep. In particular, 66% of engineering students and 43% of medical students reported having disturbed sleep, suggesting that many students are not getting enough sleep.

The study Mohd Kamaruzihan and Soe (2023) revealed that a significant number of participants reported poor sleep quality. Specifically, the PSQI scores indicated that university students had an average score of 6.7, which is higher than the average score of 5.54 for schoolchildren. This suggests that university students may experience shorter sleep durations or more disrupted sleep patterns. Previous research has similarly found that students often do not meet the recommended sleep duration of 7 to 9 hours per night, leading to sleep deprivation and its associated consequences (Whipps et al., 2018).

Regarding sleep duration, the study by Ramesh et al. (2020) utilized PSQI to assess various sleep parameters among the participants. The results revealed that a significant portion of the students reported poor sleep quality, with many not achieving the recommended sleep duration for optimal functioning. Specifically, the research discovered that 56.43% of students reported poor sleep quality, which was frequently linked with insufficient sleep duration. This finding is consistent with existing literature highlighting students' challenges in obtaining adequate sleep due to academic pressures and lifestyle choices, including late-night screen use.

### 2.3 Relationship between Screen Time and Sleep Quality among students

Numerous studies have found that increased screen time is associated with poorer sleep quality. The study by Sahu et al. (2024) discovered a strong positive correlation involving screen time and sleep quality, with a Pearson's correlation coefficient of 0.86. This indicates that as time spent on screens increases, quality of sleep decreases. The adverse effects of screen time on sleep are attributed to several factors, including the impact of blue light on melatonin production and the potential for screens to disrupt sleep routines. Furthermore, excessive screen time, particularly before bedtime, has been linked to increased sleep latency and reduced sleep efficiency, further exacerbating sleep quality issues among students.

The research by Nizamuddin et al. (2021) demonstrates a clear association between increased screen time and poor sleep quality among students. Specifically, students who reported higher screen time were more likely to experience sleep disturbances and reduced sleep quality. This relationship is particularly concerning given the high prevalence of screen use among students, which often occurs in the evening and may interfere with their ability to fall asleep. The findings indicate that excessive screen time, particularly prior to bedtime, may interfere with circadian rhythms and lead to sleep-related problems.

Baby et al. (2021) found a significant negative correlation ( $p = -0.61$ ,  $p < 0.001$ ) between smartphone screen time and sleep quality among the participants. This indicates that as screen time increases, sleep quality decreases, consistent with previous research findings suggesting excessive screen exposure can lead to sleep disturbances.

In the study by Mohd Kamaruzihan and Soe (2023), a weak association was found between screen time and sleep quality, with a p-value of 0.251 indicating no significant correlation. However, respondents who reported excessive screen time (more than 12 hours) exhibited higher mean PSQI scores, suggesting poorer sleep quality.

In the study by Sahu et al. (2024), a strong positive correlation was found between screen time and sleep quality, with a Pearson's correlation coefficient of 0.86. This implies that sleep quality tends to deteriorate as screen time rises. Furthermore, excessive screen time, particularly before bedtime, has been linked to increased sleep latency and reduced sleep efficiency, further exacerbating sleep quality issues among students.

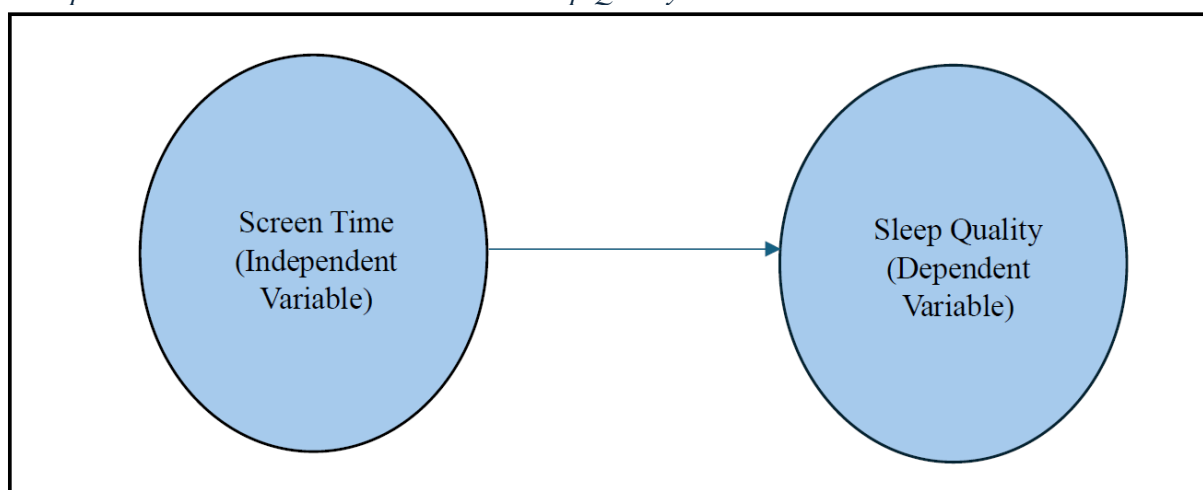
## 2.4 Conceptual Framework

This study's conceptual framework is based on the notion that heightened screen time among undergraduate nursing students in the Faculty of Medicine and Health Sciences (FMHS) at Universiti Malaysia Sarawak (UNIMAS) may lead to diminished sleep quality.

This study's conceptual framework highlights the relationship between screen time and sleep quality in UNIMAS undergraduate nursing students. The independent variable of screen time is evaluated through the HELENA screen time-based sedentary behaviour questionnaire. The PSQI is utilized to assess sleep quality, which serves as the dependent variable (refer Figure 2.1).

**Figure 2.1**

*Conceptual Framework on Screen Time and Sleep Quality*



## 2.5 Summary

All the study above employed a cross-sectional design that has similar limitations. The study utilized self-reported questionnaires to evaluate screen time and sleep quality. However, self-reported data can be biased, as participants may underestimate or overestimate their screen time and sleep duration. This concern is especially pertinent for nursing students, who may feel pressured to meet certain academic standards. As a result, they might not accurately disclose their screen habits or sleep issues due to stigma or fear of judgment. The limitations identified in those studies highlight the need for further research specifically targeting nursing students as it lacks specific focus on nursing students.

## CHAPTER 3

### METHODOLOGY

#### 3.0 Introduction

The research methodology, context, population, sampling strategy, sample size, and inclusion/exclusion criteria are all laid out in this chapter. Data analysis, data collecting, ethical considerations, and a pilot study are also covered.

#### 3.1 Research design

The research design aims to establish a suitable framework for the study Jilcha (2019). Hence, this study employed a cross-sectional, quantitative design to investigate the relationship between screen time and sleep quality among undergraduate nursing students at UNIMAS. The quantitative approach entails gathering and analysing numerical data to tackle scientific research questions. This method is employed to average, summarise, identify patterns, test causal relationships, generate predictions, and generalise findings to larger populations (Rana et al., 2021). Thus, the quantitative study design matches the purpose of this study. A cross-sectional design particularly benefits this research because data can be collected at one point in time, creating a snapshot of participants' screen time habits and their reported quality of sleep. This design is very applicable in health and behavioural research, considering testing the association of variables in the population of interest (Setia, 2016). According to Kesmodel (2018), a cross-sectional study is more cost-effective and time-efficient, as data collection occurs at a single point in time.

### **3.2 Research setting**

This research was conducted at UNIMAS, specifically within FMHS, roughly 25 km from Kuching, the capital of Sarawak. This study focused exclusively on undergraduate nursing students enrolled in FMHS at UNIMAS.

### **3.3 Population**

Faculty of Medicine and Health Sciences (FMHS) consists of two major programmes: Medicine and Nursing. This study, however, focuses specifically on the Nursing programme. Within this programme, there are 237 undergraduate nursing students from diverse backgrounds in this faculty. The cohort comprises 51 students from Year 1, 64 students from Year 2, 58 students from Year 3, and 64 students from Year 4.

### **3.4 Sampling**

#### **3.4.1 Sampling Method**

The process of choosing a subset of a population of interest to study is known as sampling. A basic random sampling technique was used to select study participants. Every member of the population has an equal chance of being chosen for the sample using the probability sampling technique known as simple random sampling (Elfil & Negida, 2017). According to Elfil and Negida (2017), this technique is used when a whole population is available and the researchers acquire a complete record of all subjects within that population. The entire list is often referred to as the "sampling frame." This list will be used to draw a random sample, either by lottery or by computer-generated randomness. The list of nursing students from FMHS at UNIMAS, covering years 1 to 4, was obtained from the FMHS office. There are 237 students in total, and the name list were numbered sequentially from 1 to 237. A random number was generated using Excel. To generate a random number in Excel, the researcher started by clicking on the cell where

the researcher wants the random number to appear. Next, the formula =RAND() was entered and "Enter" was pressed to create a random number. Simple random sampling lowers the risk of research biases, such as selection bias and sampling bias (Thomas, 2023).

### 3.4.2 Sample Size

The sample size was calculated using Taro Yamane (1973) simplified formula. The sample size was calculated as follows:

$$n = \frac{N}{1 + Ne^2}$$

$n$  = sample size

$N$  = population size

$e$  = error (0.05) reliability level 95%

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{236}{1 + (236)(0.05)^2}$$

$$n = 148$$

Based on this formula, the sample size for this study is estimated to be 148. However, the researcher must account for participant compensation, such as those who refuse to participate, and thus add 10 % to the sample size (Das et al., 2016). To account for missing data in the sample, an additional 10 % attrition rate was applied. After accounting for 10 %, the total sample size for this study was 164. The calculation is as follows:

#### **Calculation of Sample Size with Attrition Rate:**

$$\text{Final sample size} = \text{Sample size} + (\text{Calculated Sample size} \times 10\%)$$

Final sample size =  $148 + (148 \times 10\%)$

Final sample size =  $149 + 14.8$

Final sample size = 162.8

Final sample size  $\approx 163$

### **3.4.3 Inclusion and Exclusion Criteria**

#### **3.4.3.1 Inclusion Criteria**

The inclusion criteria for this study are:

- a) Undergraduate nursing students from Year 1 to Year 4
- b) Willing to take part in the research

#### **3.4.3.2 Exclusion Criteria**

The exclusion criteria for this study are:

- a) Nursing students who have participated in the pilot study
- b) Students from other programs

### 3.5 Research Instrument

Data from the participants was collected using a structured online survey questionnaire that was made available as open access. All questions were presented in English. The online survey was divided into three sections: Section 1 (Sociodemographic), Section 2 (Screen time usage), and Section 3 (Sleep quality). Section 2 (Screen time usage) was adopted from the HELENA screen time-based sedentary behaviour questionnaire (Rey-López et al., 2011) while Section 3 (Sleep quality) was adopted from PSQI (Buysse et al., 1989) (refer Appendix D).

For Section 1, it consisted of seven items, which were matric number, age, gender, race, years of study, types of electronic devices own, and number of electronic devices own. It included fill-in-the-blank and multiple-choice questions.

Section 2 of the questionnaire was adapted from the HELENA Screen-Based Sedentary Behaviour Questionnaire (Rey-López et al., 2011) to assess screen time among participants during both weekdays and weekends. It comprised seven common screen-based activities: smartphone use, tablet use, laptop use, television viewing, video console gaming, internet use for study purposes, and internet use for non-study purposes. For each activity, participants reported their typical daily screen time by selecting one of the following categorical time intervals: “Nothing,” “Until ½ hour,” “½ to 1 hour,” “1 to 2 hours,” “2 to 3 hours,” “3 to 4 hours,” and “More than 4 hours.” Each response was initially coded on a 7-point scale ranging from 0 to 6.

To enable quantitative analysis, each response was then recoded into estimated numeric values using the midpoint of each time interval. For example, “Until ½ hour” was recoded as 0.25 hours, “½ to 1 hour” as 0.75 hours, “1 to 2 hours” as 1.5 hours, and so on. The category “More than 4 hours” was assigned a value of 5.0 hours as a reasonable conservative estimate. This midpoint approach is commonly used in survey research to approximate continuous data from categorical time intervals, allowing for more accurate summation and statistical analysis. The

final recoded values were as follows: 0 = 0.00, 1 = 0.25, 2 = 0.75, 3 = 1.50, 4 = 2.50, 5 = 3.50, and 6 = 5.00.

Separate variables were created for each activity on weekdays and weekends. Total screen time for each day type was calculated by summing the recoded hour values across all seven activities. Subsequently, the average daily screen time was computed using the formula, which represented the average screen time per day over a typical week:

$$\text{Average daily screen time} = \frac{(\text{Weekday} \times 5) + (\text{Weekend} \times 2)}{7}$$

Section 3 of the questionnaire assessed participants' sleep quality using the Pittsburgh Sleep Quality Index (PSQI) developed by Buysse et al. (1989). The PSQI consists of 9 items that contribute to 7 component scores: (1) Subjective Sleep Quality, (2) Sleep Latency, (3) Sleep Duration, (4) Habitual Sleep Efficiency, (5) Sleep Disturbances, (6) Use of Sleeping Medication, and (7) Daytime Dysfunction. Each component was scored from 0 to 3, with higher scores indicating poorer sleep quality.

Responses to PSQI items were recoded in SPSS following the official scoring guidelines. For example, sleep latency (Q2) was scored as 0 = <15 minutes, 1 = 15–30 minutes, 2 = 31–60 minutes, and 3 = >60 minutes. Sleep duration (Q4) was scored as 0 = >7 hours, 1 = 6–7 hours, 2 = 5–6 hours, and 3 = <5 hours. Sleep disturbances (Q5) consisted of 9 sub-items, each rated on a 4-point Likert scale from 0 (Not during the past month) to 3 (Three or more times a week). The total score from all 9 sub-items (ranging from 0 to 27) was then recoded into 0 = 0–9, 1 = 10–12, 2 = 13–18, 3 = 19–27, following a standard conversion.

Other components were also coded using the 4-point Likert scale: Q6 (subjective sleep quality) was rated from 0 = Very good to 3 = Very bad; Q7 (sleep medication use), Q8 (daytime dysfunction), and Q9 (sleep timing and efficiency) followed the same frequency scale as Q5.

Habitual sleep efficiency (component 4) was calculated as (total sleep time ÷ total time in bed × 100%), then categorized into 0 = ≥85%, 1 = 75–84%, 2 = 65–74%, and 3 = <65%.

Each component score was computed separately in SPSS and summed to generate the PSQI global score, which ranged from 0 to 21. Participants were then categorized into two groups based on the standard cut-off: scores >5 were classified as having poor sleep quality, and scores ≤5 as good sleep quality. This scoring allowed for both continuous and categorical analysis of sleep quality outcomes.

### **3.6 Validity and Reliability**

Validity and reliability are critical ideas in research that guarantee the precision and consistency of instruments used to measure data.

#### **3.6.1 Validity**

Validity is the extent to which the results accurately assess the intended outcome. Validity is the correctness, appropriateness, meaningfulness, and usefulness of the researcher's inferences (Ahmed & Ishtiaq, 2021).

In this research, face validity was used. Face validity describes an instrument's suitability for measuring its intended concept. Face validity assesses whether the questionnaire is appropriate, clear, and relevant for the target population, specifically undergraduate nursing students. This process ensures that participants clearly understand the questions and that they align with the research objectives (Masuwai et al., 2024). To assess this, the questionnaire was reviewed by my research supervisor for clarity, relevance, and alignment with the study objectives. Additionally, a pilot study involving 16 nursing students was conducted to gather feedback on the wording, clarity, and ease of understanding. Minor adjustments were made based on the feedback to ensure that the instrument was suitable and comprehensible for the actual data collection.

### **3.6.2 Reliability**

Reliability refers to an instrument's consistency, meaning that it produces consistent and comparable results over time under regular circumstances (Ahmed & Ishtiaq, 2021). When the finding is valid, it indicates statistical correctness. Cronbach's alpha is an especially frequently employed method for assessing the internal reliability of an instrument. Cronbach's alpha value above 0.7 generally indicates acceptable internal consistency for most research purposes (Taber, 2018).

Reliability testing was conducted through a pilot study involving 16 undergraduate nursing students who were not part of the main study sample. The purpose was to assess the internal consistency of the research instruments used. For the HELENA Screen-Time Based Sedentary Behaviour Questionnaire, the Cronbach's alpha was 0.871, which reflects acceptable reliability in measuring screen time usage. The Cronbach's alpha obtained for the Pittsburgh Sleep Quality Index (PSQI) was 0.830, indicating good internal consistency for assessing sleep quality. These results confirm that both instruments demonstrated satisfactory internal consistency for use in the actual study.

### **3.7 Ethical Consideration**

Prior to the initiation of the study, ethical approval was secured from the Research and Ethics Committee of the Faculty of Medicine and Health Sciences at UNIMAS (refer Appendix A). Additionally, the researcher sent a formal consent email to the authors, requesting their permission to use the questionnaire tools for the study. Only one of the authors responded, however, the researcher closely tracked each author (refer Appendix E). Formal informed consent was obtained from participants who agreed to participate in the study, and they were made aware of their right to withdraw at any time without facing consequences or penalties. The online survey questionnaire contained a summary, details about the study's objectives, and the researcher's contact information. Confidentiality and anonymity of the participants were protected using

secured and password-protected devices. The data could only be accessed by the researcher and the supervisor.

### **3.8 Pilot study**

A pilot study is a crucial initial phase in research, performed to evaluate and enhance the research instruments and data collection procedures before the main study. According to In (2017), the objective of the pilot study is to evaluate the questionnaire's validity and to facilitate the researcher's understanding of the study's precise objectives and inquiries. Feedback from participants in the pilot study highlighted areas of the questionnaire that could be clarified or improved. This process is essential in refining the instrument, ensuring the main study is high-quality and efficient. This research conducted a pilot study with a small group of UNIMAS undergraduate nursing students to evaluate the clarity, feasibility, and reliability of the questionnaire items concerning screen time (HELENA) and sleep quality (PSQI).

According to Whitehead et al. (2016), the pilot study comprised 10% of the total sample size, and the participants from the pilot study were excluded from the main study. The pilot study data was analysed for internal consistency using Cronbach's alpha to verify the coherence and reliability of the instruments. Therefore, to perform the pilot study, 10% of sample size was selected to participate.

Pilot study:  $163 \times 10\% = 16.3$  which were 16 participants.

The sample size of this study was 164 participants; therefore, 10% of the sample size was 16.4, which was rounded to 16. In summary, the pilot study used the same sampling method as the actual study, selecting 16 nursing students who met the inclusion criteria. The data collected during the pilot study were not included in the final analysis, and these 16 participants were also excluded from participating in the actual study. The Cronbach alpha for screen time was .871 and Cronbach alpha for sleep quality was .830 which indicated that the questionnaire was suitable for this research study.

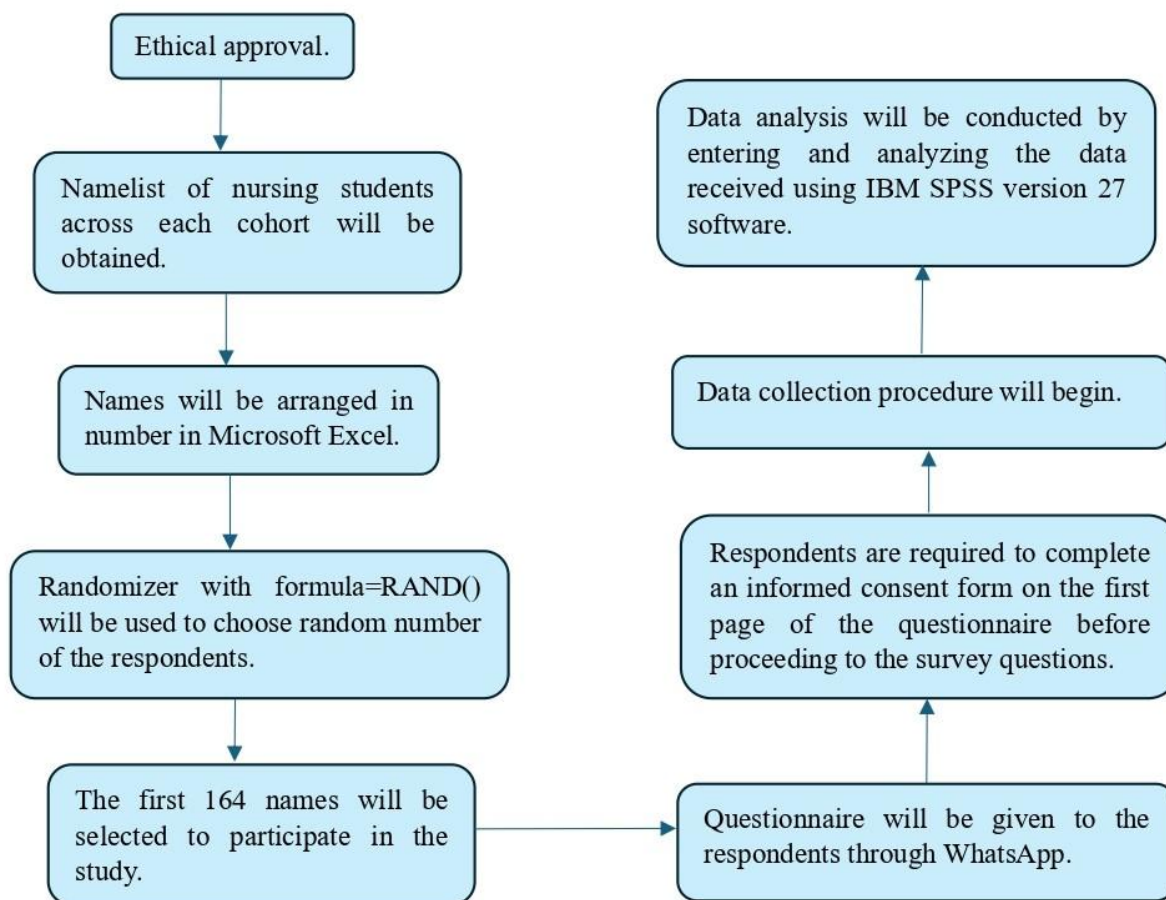
### 3.9 Data collection procedure

The actual study's data collection procedure was designed to systematically select participants and collect data aligned with the research objectives. In this study, data were collected through an online, self-administered survey via Google Forms. Each item was designated as mandatory for respondents to answer. The questionnaire was prepared in English. The main study did not include participants from the pilot study in its data collection. The target population consisted of undergraduate nursing students at UNIMAS, spanning from Year 1 to Year 4, who met the inclusion criteria.

Ethical approval was obtained from the Research and Ethics Committee of the Faculty of Medicine and Health Sciences at the University of Malaysia Sarawak (UNIMAS). The name list of nursing students across each cohort was then obtained. Next, names were arranged in numbers in Microsoft Excel. The participants were selected using a simple random method. Random numbers were generated using Excel. To generate random numbers in Excel, the cell where the random number was to be produced was selected, and the formula =RAND() was entered, followed by pressing the "Enter" key to produce a random number. A total of 164 names were chosen for participation in the study. Eligible participants who consented to take part in the study were recruited. The questionnaire was distributed to the participants through WhatsApp. Each participant was required to complete an informed consent form on the first page of the questionnaire before proceeding with the survey questions. The consent form provided the researcher's phone number, allowing participants to contact the researcher with any questions about the questionnaire. The data collection procedure then began, and data analysis was conducted by entering and analysing the data received using IBM SPSS version 27 software.

**Figure 3.1**

*Process of Data Collection*



**3.10 Data analysis**

The data gathered in this study were analysed using IBM's Statistical Package for the Social Sciences (SPSS) version 27. Descriptive and inferential statistics were employed to summarise the sample characteristics, using measures such as frequency, percentage, mean, and standard deviation for the variables. Categorical data were presented as frequencies or percentages and depicted in a bar chart. Continuous data that followed a normal distribution were represented by the mean and standard deviation, whereas continuous data that did not follow a normal distribution were presented using the median and interquartile range.

Parametric tests were applied to normally distributed data, including the T-test for two variables, ANOVA for three or more variables, and Pearson correlation for association testing. For data that were not normally distributed, non-parametric tests were used, such as the Chi-square test, the Mann-Whitney test for two variables, the Kruskal-Wallis H test for three or more variables, and Spearman's rho for correlation analysis. The Kolmogorov-Smirnov test was used to evaluate the normality of continuous data, as the sample size exceeded 50 (Mishra et al., 2019).

The results of the data gave a p-value of .200, which indicated a normal distribution, and a p-value of <.001, which indicated a not normally distribution (refer table 3.1 below). The relationship between screen time and sleep quality among UNIMAS undergraduate nursing students was analysed using Spearman's rho correlation.

**Table 3.1**

*Normality Test for Screen Time and Sleep Quality*

<b>Items</b>	<b>Descriptive Statistics</b>	<b>Test of Normality (sig.)</b>	<b>Interpretation</b>
Total Screen Time (hours)	Mean: 29.3021 5% of Trimmed Mean: 29.2429	.200	Normally distributed
PSQI Global Score	Mean: 7.26 5% of Trimmed Mean: 7.15	<.001	Not normally distributed

*Note.* Kolmogorov-Smirnov test for screen time was not significant ( $p = .200$ ), indicating normal distribution. PSQI Global Score was significant ( $p < .001$ ), indicating non-normal distribution.

## CHAPTER 4

### RESULTS

#### 4.0 Introduction

This chapter presents the findings of the study obtained from 163 undergraduate nursing students at UNIMAS. All the result were acquired based on the research objectives of the study which were to determine the screen time among UNIMAS undergraduate nursing students, to assess the sleep duration among UNIMAS undergraduate nursing students, and to examine the relationship between screen time and sleep quality among UNIMAS undergraduate nursing students. The results are organized into four main sections which were 4.1 socio-demographic characteristics of undergraduate nursing students in UNIMAS, 4.2 screen time among UNIMAS undergraduate nursing students, 4.3 sleep duration among UNIMAS undergraduate nursing students, 4.4 the relationship between screen time and sleep quality among UNIMAS undergraduate nursing Students, and 4.5 summary of chapter 4.

#### 4.1 Socio-demographic Characteristics of Undergraduate Nursing Students in UNIMAS

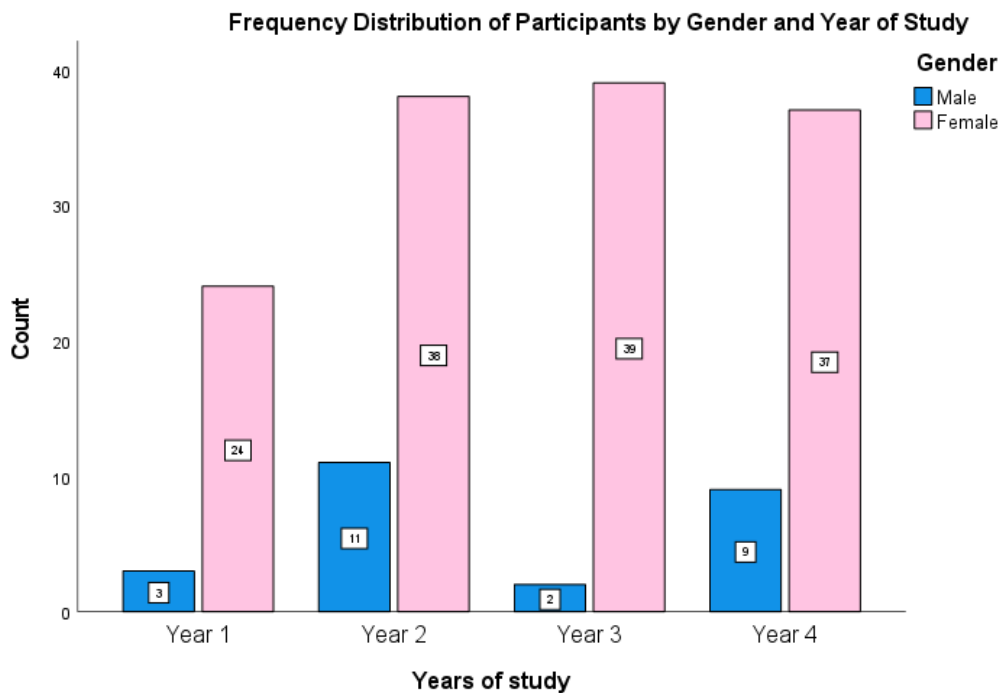
A total of 163 undergraduate nursing students in UNIMAS were recruited for the actual study. There were no outliers or extreme values from screening the data. Out of the participants, 138 (84.7%) were female and 25 (15.3%) of them were male (refer figure 4.1 below). The highest participants were in the group of 27% ( $n=44$ ) 22 years old while the lower participants were from 0.6% of 27 years old age group ( $n=1$ ). A Kolmogorov-Smirnov test showed a significant departure from normality,  $D(163) = .17, p < .001$ . The median age among the participants is 22 years old ( $IQR = 2$  years old). The maximum age is 27 years old while the minimum age is 20 years old. The range is 8 years old. The mode age is 22 years old. Most of the participants were *Melayu* and *Bumiputera Sarawak* with each frequency of 61 participants (37.4%). Followed by, *Bumiputera Sabah* ( $n=35, 21.5\%$ ), *Cina* ( $n=5, 3.1\%$ ), and *India* ( $n=1, 0.6\%$ ). As for year of study, year 2 had

the most participants ( $n=49$ , 30.1%), followed by year 4 ( $n=46$ , 28.2%), year 3 ( $n=41$ , 25.2%) and year 1 ( $n=27$ , 16.6%) (refer table 4.1 below).

In this study, all participants were recorded to own smartphone ( $n=163$ , 100%). For tablet, 148 participants owned tablet (90.8 %) while 15 participants did not own tablet (9.2%). 95.7% owned laptop ( $n=156$ ) while 4.3% did not own laptop ( $n=7$ ). For television, majority did not own television ( $n=137$ , 84%) while 26 participants owned television ( $n=26$ , 16%). As for video console, 153 participants did not own (93.9%) and 10 participants owned video console (6.1%). Out of 163 participants, 105 of them owned 3 electronic devices (64.4%), followed by 4 electronic devices ( $n=36$ , 22.1%), 2 electronic devices ( $n=14$ , 8.6%), 5 electronic devices ( $n=6$ , 3.7%) and owned more than 5 electronic devices ( $n=2$ , 1.2%) (refer figure 4.2 below).

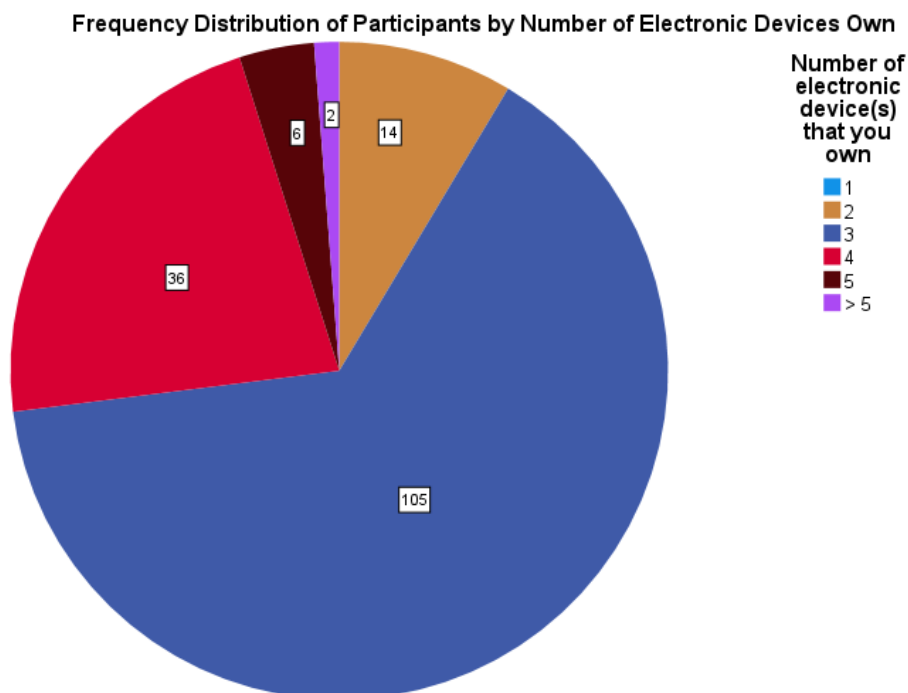
**Figure 4.1**

*Frequency Distribution of Participants by Gender and Year of Study*



**Figure 4.2**

*Frequency Distribution of Participants by Number of Electronic Devices Own*



**Table 4.1**

*Sociodemographic variables of UNIMAS Undergraduate Nursing Students (n=163)*

Description	Frequency (n)	Percentage (%)	Median (M)	Interquartile Range (IQR)
<b>Age (years old)</b>				
19	2	1.2		
20	22	13.5		
21	44	27.0		
22	36	22.1		
23	37	22.7	22	2
24	17	10.4		
25	2	1.2		
26	2	1.2		
27	1	0.6		
<b>Gender</b>				
Male	25	15.3		
Female	138	84.7		

<b>Race</b>		
<i>Melayu</i>	61	37.4
<i>Cina</i>	5	3.1
<i>India</i>	1	0.6
<i>Bumiputera Sabah</i>	35	21.5
<i>Bumiputera Sarawak</i>	61	37.4
<b>Year of study</b>		
Year 1	27	16.6
Year 2	49	30.1
Year 3	41	25.2
Year 4	46	28.2
<b>Owns Smartphone</b>		
Owned	163	100
<b>Owns Tablet</b>		
Not owned	15	9.2
Owned	148	90.8
<b>Owns Laptop</b>		
Not owned	7	4.3
Owned	156	95.7
<b>Owns Television</b>		
Not owned	137	84.0
Owned	26	16.0
<b>Owns Video Console</b>		
Not owned	153	93.9
Owned	10	6.1
<b>Number of electronic devices owned</b>		
2	14	8.6
3	105	64.4
4	36	22.1
5	6	3.7
>5	2	1.2

---

*Note.* n (frequency), % (percentage), M (median), IQR (Interquartile range)

## 4.2 The Screen Time Among UNIMAS Undergraduate Nursing Students

Table 4.2 presents the screen time patterns among UNIMAS undergraduate nursing students, based on various types of devices and usage purposes. A total of 163 students participated in the study. Descriptive statistics and frequency analyses were conducted to assess screen time patterns among UNIMAS undergraduate nursing students across different electronic devices on both weekdays and weekends.

The average daily screen time across all electronic devices was 14.70 hours and the standard deviation (*SD*) was 3.66, with a minimum of 6.21 hours and a maximum of 24.50 hours per day. The total screen time per week ranged from 11.25 to 49.00 hours, with a mean of 29.30 hours (*SD* = 7.41). When comparing screen use across days, students reported spending an average of 14.77 hours (*SD* = 3.74) on electronic devices during weekdays and 14.54 hours (*SD* = 4.15) during weekends.

Smartphones and internet usage (for both study and non-study purposes) were the most frequently used screen-based activities (refer to Table 4.2). On weekdays, 73.6% of students reported using smartphones for 3 to 4 hours, and this increased to 82.2% on weekends. Similarly, internet usage for non-academic purposes was reported by 71.2% of students on weekdays and 76.7% on weekends at the same duration range, indicating a strong preference for leisure activities. Academic internet use was also high, with nearly half of the students (49.1%) using it for 3 to 4 hours on weekdays, though it dropped slightly on weekends (42.3%).

Tablet and laptop usage followed a similar pattern, though at a slightly lower rate. For tablet usage, 41.1% of students reported 3 to 4 hours on weekdays and 36.8% on weekends. Laptop usage showed that 38.0% of students on weekdays and 37.4% on weekends also spent 3 to 4 hours on the device. This suggests that laptops may serve both academic and recreational purposes.

In contrast, television and video console usage were the lowest. More than half of the students reported no television use on both weekdays (55.8%) and weekends (57.1%), and a large majority reported no use of video consoles (weekday: 79.8%, weekend: 79.1%). This reflects a shift away from traditional media towards more interactive or mobile screen platforms.

Overall, these findings indicate that smartphones and internet-connected platforms dominate screen use among students, especially during weekends and for recreational purposes. The reliance on screen-based activities highlights the need to address digital time management in student health promotion strategies.

**Table 4.2**

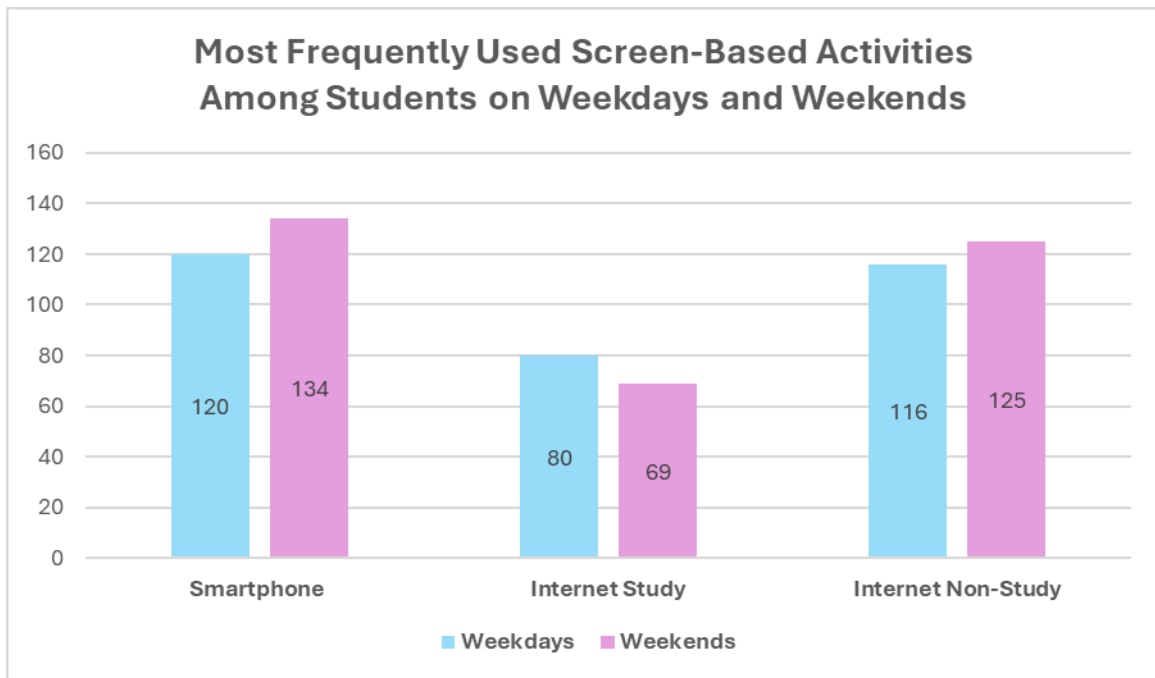
*Proportion of Students Reporting the Most Frequent Screen Time Durations by Device and Purpose*

Device/Activity	Most Frequent Duration	Findings (Weekdays)		Findings (Weekend)	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Smartphone	3 to 4 hours	120	73.6 %	134	82.2%
Tablet	3 to 4 hours	67	41.1 %	60	36.8%
Laptop	3 to 4 hours	62	38 %	61	37.4 %
Television	No use	91	55.8 %	93	57.1 %
Video Console	No use	130	79.8	129	79.1 %
Internet (Study Use)	3 to 4 hours	80	49.1 %	69	42.3%
Internet (Non-study Use)	3 to 4 hours	116	71.2%	125	76.7 %

*Note.* n (frequency), % (percentage)

**Figure 4.3**

*Most Frequently Used Screen-Based Activities Among Students on Weekdays and Weekends*



### 4.3 The Sleep Duration Among UNIMAS Undergraduate Nursing Students

Sleep duration was assessed using the fourth item of the Pittsburgh Sleep Quality Index (PSQI), which asked participants to report their actual hours of sleep per night. Descriptive analysis revealed that the mean sleep duration among UNIMAS undergraduate nursing students was 5.82 hours per night, with a standard deviation (*SD*) of 0.85 hours. The minimum reported sleep duration was 4.5 hours, and the maximum was 8.0 hours.

Table 4.3 presents the frequency distribution of students based on their self-reported sleep duration. Most participants ( $n=67$ , 41.1%) reported sleeping 5.5 hours, corresponding to the 5 to 6-hour range. This was followed by 62 students (38.0%) who reported 6.5 hours (6 to 7 hours), and 27 students (16.6%) who slept 4.5 hours (<5 hours). Only 7 students (4.3%) reported sleeping 8.0 hours, representing those who achieved more than 7 hours per night.

These findings indicate that while most students reported sleeping between 5.5 to 6.5 hours, very few met the recommended 8 hours of sleep. This pattern suggests that shorter sleep duration is common among undergraduate nursing students, possibly due to academic workload, clinical placements, and extensive screen time.

In addition to sleep duration, participants' overall sleep quality was assessed using the PSQI global score. Based on the standardized PSQI cut-off score, students were categorized into two sleep quality groups: good (score  $\leq 5$ ) and poor (score  $> 5$ ). As shown in Figure 4.4, 118 students (72.4%) were classified as having poor sleep quality, while only 45 students (27.6%) had good sleep quality.

These findings suggest that short sleep duration is prevalent among nursing students and is accompanied by poor subjective sleep quality in the majority of the sample. This highlights a need for greater attention to sleep health among university students, particularly those in demanding academic programs such as nursing.

**Table 4.3**

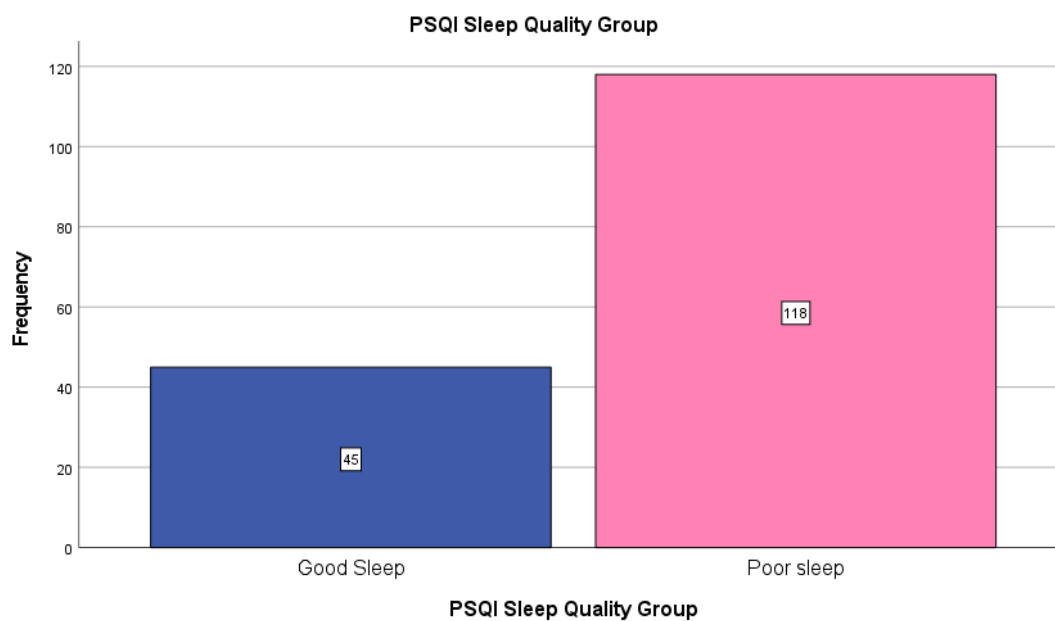
*Frequency and Percentage for Sleep Duration (hours) among UNIMAS Undergraduate Nursing Students*

Sleep Duration (hours)	Frequency (n)	Percentage (%)
< 5	27	16.6
5 to 6	67	41.1
6 to 7	62	38.0
> 7	7	4.3

*Note.* n (frequency), % (percentage)

**Figure 4.4**

*Sleep Quality Group Based on PSQI Global Score*



#### 4.4 The Relationship Between Screen Time and Sleep Quality Among UNIMAS Undergraduate Nursing Students

A normality test was conducted to determine whether the data collected were normally distributed before selecting the appropriate statistical test for the inferential analysis. The Kolmogorov-Smirnov test was used to assess the distribution of the variables: total screen time (hours) and PSQI global score. The results are shown in Table 4.4.

The significant value for the PSQI global score was  $p < .001$ , which is less than the alpha level of 0.05. According to Beers (2022), this indicates that the data for PSQI global score were not normally distributed. Meanwhile, the significant value for total screen time was  $p = .200$ , which is greater than 0.05, suggesting that this variable was normally distributed (Beers, 2022). As one of the variables violated the assumption of normality, a non-parametric test was selected for further inferential analysis (Grant, 2021).

**Table 4.4**

*Normality Test for Screen Time (hours) and Sleep Quality*

	Tests of Normality					
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
total screentime (hours)	.049	163	.200*	.994	163	.713
PSQI GlobalScore	.455	163	.000	.559	163	.000

*Note.* Kolmogorov-Smirnov test for screen time was not significant ( $p = .200$ ), indicating normal distribution. PSQI Global Score was significant ( $p < .001$ ), indicating non-normal distribution.

Normality testing was conducted using the Kolmogorov-Smirnov test, which indicated that the PSQI global score was not normally distributed ( $p < .001$ ). Therefore, a Spearman's rho correlation was performed to examine the relationship between screen time and sleep quality among UNIMAS undergraduate nursing students.

The results in table 4.5 showed that there was no statistically significant correlation between total screen time and PSQI global score among UNIMAS undergraduate nursing students,  $\rho (163) = .041$ ,  $p = .606$ . This indicates a very weak and non-significant positive relationship between screen time and sleep quality. In other words, variations in screen time were not meaningfully associated with students' sleep quality.

**Table 4.5**

*Relationship between Screen Time and Sleep Quality Among UNIMAS Undergraduate Nursing Students*

<b>Correlations</b>				
			total screentime (hours)	PSQI GlobalScore
Spearman's rho	total screentime (hours)	Correlation	1.000	.041
		Coefficient		
		Sig. (2-tailed)	.	.606
		N	163	163
	PSQI GlobalScore	Correlation	.041	1.000
		Coefficient		
		Sig. (2-tailed)	.606	.
		N	163	163

*Note.* Spearman's rho was used.

#### 4.4.1 Comparison of Screen Time between Good and Poor Sleep Quality Groups

A Mann–Whitney U test was conducted to compare total screen time between students with good and poor sleep quality. The results showed that students with poor sleep had a slightly higher mean rank (83.18) compared to those with good sleep (78.90). However, this difference was not statistically significant,  $U = 2794.50$ ,  $p = .604$  (refer Table 4.6).

These findings indicate that although students with poor sleep quality tended to have higher screen time, the difference was not large enough to conclude a meaningful relationship. Therefore, Mann-Whitney U test results indicated no significant difference in screen time between students with good and poor sleep quality ( $p = .604$ ).

**Table 4.6**

*Mann-Whitney U Test Summary for Total Screen Time Across PSQI Sleep Quality Groups*

Statistic	Value
Total sample size (N)	163
Mann-Whitney U	2794.50
Wilcoxon W	9815.50
Test statistic	2794.50
Standard error	269.31
Standardized test statistic (z)	0.52
Asymptotic significance (2-tailed)	.604

*Note.* The Mann-Whitney U test was used to examine differences in total screen time between PSQI sleep quality groups. The results were not statistically significant,  $U(N = 163) = 2794.50$ ,  $z = 0.52$ ,  $p = .604$

## 4.5 Summary

In summary, UNIMAS undergraduate nursing students reported high screen time, averaging 14.70 hours per day. Smartphones and internet use, particularly for non-study purposes, were the most frequently used devices, while television and video consoles were the least used. Most students reported sleeping between 5.5 to 6.5 hours per night, which is below the recommended 8 hours. Only a small number (4.3%) reported sleeping more than 7 hours. Since the PSQI global score was not normally distributed, a Spearman's correlation test was conducted and found no significant relationship between total screen time and sleep quality. In addition, a Mann–Whitney U test was performed to compare screen time between students with good and poor sleep quality, which also showed no significant difference. The effect size was small, indicating little practical difference between the groups. Overall, both high screen time and poor sleep quality were common among students, but no significant relationship was found between the two.

## **CHAPTER 5**

### **DISCUSSION**

#### **5.0 Introduction**

This chapter discusses the findings of the study in relation to the research objectives and existing literature. The purpose of this study was to examine the screen time and sleep quality among undergraduate nursing students at Universiti Malaysia Sarawak (UNIMAS), and to determine whether there is a relationship between these two factors. The discussion is organized according to the three research objectives which are to determine the screen time among UNIMAS undergraduate nursing students, to assess the sleep duration among UNIMAS undergraduate nursing students, and to examine the relationship between screen time and sleep quality. The results are interpreted in the context of previous studies and theoretical understanding. This chapter also outlines the implications of the findings, the limitations of the study, and provides suggestions for future research.

#### **5.1 Screen Time Among UNIMAS Undergraduate Nursing Students**

This study found that UNIMAS undergraduate nursing students spent an average of 14.70 hours per day on screen-based activities, which is considerably high. The most frequently used devices were smartphones and the internet for non-study purposes, particularly during weekends. In contrast, devices such as television and video consoles were used far less frequently. These results suggest that most of the students' screen exposure is associated with mobile and internet-connected platforms.

The high screen time observed in this study aligns with global patterns. A study by Kaewpradit et al. (2025) reported that 29.7% of university students spent 4 to 6 hours daily on smartphones, primarily for social media and recreational browsing. Similarly, a Malaysian study

by Chan et al. (2021) found that students rely heavily on smartphones and the internet not only for academic tasks but also for communication, gaming, and streaming services. Their findings showed that the majority of students spent 3 to 6 hours daily on smartphones. While Chan et al.'s study focused solely on smartphones, the present study expanded the scope to include various digital devices, and the results still indicated that smartphones and the internet were the dominant sources of screen time. One notable difference is the total screen exposure. While Chan et al. (2021) and Kaewpradit et al. (2025) reported that students spent an average of 3 to 6 hours per day on smartphones, this study found a much higher overall screen time of 14.70 hours per day, suggesting that students may be using multiple devices concurrently or engaging in prolonged academic and leisure screen activities. This could be influenced by the academic workload and lifestyle patterns specific to nursing students.

One possible explanation for the elevated screen time in this sample is the academic use of digital platforms for learning materials, assignments, and communication with peers or lecturers. However, the substantial use of screens for non-academic purposes highlights a possible imbalance between digital learning and digital leisure. This is consistent with findings from Kalidasan et al. (2020), who reported that non-academic screen time significantly increased during periods of reduced in-person classes, such as during the COVID-19 pandemic. Their study found that prolonged exposure to smartphones, laptops, and other digital devices was driven not only by academic activities such as online classes and assignments but also by entertainment, gaming, and social media engagement. This aligns with the current study, where both academic and non-academic screen time contributed to high overall daily usage.

Overall, these results suggest that screen time plays a major role in the daily lives of UNIMAS undergraduate nursing students. While some usage supports academic activities, the overall high level of screen exposure highlights the need to promote balanced screen habits and

raise awareness about the potential impact on health and well-being, including sleep quality and mental focus.

## **5.2 Sleep Duration Among UNIMAS Undergraduate Nursing Students**

This study found that most UNIMAS undergraduate nursing students did not meet the recommended sleep duration of 7 to 9 hours per night. The average sleep duration was 5.82 hours per night ( $SD = 0.85$ ), with most participants reporting between 5.5 and 6.5 hours of sleep. Only 4.3% of participants reported achieving more than 7 hours of sleep. These results indicate that short sleep duration is prevalent within this group. In addition to reduced sleep duration, sleep quality was also notably poor. Based on PSQI global scores, 72.4% of students were classified as having poor sleep quality, while only 27.6% reported good sleep quality. This suggests that even when sleep quantity approaches moderate levels, students may still experience insufficient rest due to poor sleep efficiency, disturbances, or difficulty falling asleep.

These findings are consistent with previous studies. For example, de-Arruda et al. (2024) found that short sleep duration was common among university students, with the average sleep duration being 6.51 hours. Their study also reported that students with poor sleep habits were more likely to skip meals and experience lifestyle disruptions. While the present study did not assess dietary behaviour, the average sleep duration among UNIMAS nursing students aligns with this pattern and suggests broader lifestyle concerns.

Similarly, Nurismadiana and Lee (2018) conducted a study among undergraduate students at Universiti Putra Malaysia (UPM) and reported that 70.6% of the participants experienced poor sleep quality, with a mean PSQI score of  $7.12 \pm 2.63$ . The prevalence of poor sleep quality in the UPM study closely mirrors the 72.4% observed in the current study, indicating a consistent trend of inadequate sleep quality among Malaysian university students. Additionally, the UPM study highlighted that poor sleep quality was associated with factors such as excessive daytime sleepiness and elevated stress levels.

The poor sleep outcomes observed in this study could be explained by the academic and clinical demands placed on nursing students. The combination of long study hours, irregular sleep schedules, and frequent use of digital devices may contribute to delayed bedtimes and fragmented sleep. Even when total sleep duration is moderate, poor sleep efficiency and disturbances may reduce overall sleep quality. Together, these findings highlight the urgent need for health promotion programs aimed at improving sleep behaviours in university settings. Given their future roles in healthcare, it is essential that nursing students adopt healthy sleep practices to support both their academic success and personal well-being.

### **5.3 Relationship between Screen Time and Sleep Quality Among UNIMAS Undergraduate Nursing Students**

Despite high screen usage and a high proportion of poor sleep quality, this study found no significant relationship between total screen time and sleep quality. This aligns with findings from Mohd Kamaruzihan and Soe (2023), who also reported no significant association between screen time duration and sleep quality among their participants ( $p = 0.251$ ), although students with more than 12 hours of screen exposure tended to have higher PSQI scores. Both studies suggest that while screen time is generally high among university students and poor sleep quality is prevalent, other factors beyond total screen duration such as timing, type of screen use, and stress may play a more substantial role in shaping sleep outcomes.

In contrast, Nizamuddin et al. (2021) reported a strong and statistically significant association between screen time and poor sleep quality among college and university students in Karachi. They found that students with more than two hours of screen time per day on weekends had significantly higher odds of poor sleep ( $OR = 24.15$ ). Their findings suggest that even moderate levels of screen use were strongly linked to sleep disturbances in their context.

One possible explanation for the lack of significant correlation in this study is the nature of screen use. A substantial portion of screen time reported by UNIMAS students was for academic purposes, which may not affect sleep patterns as severely as recreational screen use. While overall screen time in this study was high, a large proportion of it was for academic purposes. Many students spent extended hours using the internet both for study such as assignments, research and non-study purposes such as social media, streaming. It is possible that academic screen use has a different effect on sleep compared to recreational screen use, with the latter more likely to disrupt sleep onset or sleep hygiene habits.

Cultural and lifestyle differences between the study populations may also contribute to the contrasting results. Differences in academic schedules, screen use norms, stress levels, and

sleep hygiene practices between Malaysian and Pakistani students could have influenced the outcomes.

In conclusion, although this study did not find a significant relationship between total screen time and sleep quality, the prevalence of poor sleep quality (72.4%) and high screen exposure among students remains concerning. It is likely that other factors, such as screen timing, content type, stress, and lifestyle, interact with screen time to affect sleep. Future studies should consider exploring these mediators to develop a more nuanced understanding of how screen behaviours influence sleep health.

#### **5.4 Implications of The Study**

The findings highlight the need for increased awareness and education around healthy screen time use and sleep hygiene among nursing students. Universities and faculty can address this by integrating health talks, wellness campaigns, or incorporating sleep education into existing student support programs. Visual infographics, peer sharing sessions, or integrating reminders through learning platforms could also help students reflect on their daily screen and sleep behaviours.

In terms of time management, strategies such as using digital well-being tools like screen timers or focus apps, setting scheduled screen breaks, avoiding device use at bedtime, and prioritizing academic tasks earlier in the day can help students reduce excessive recreational screen time and maintain healthier routines. These efforts are important as nursing students prepare for a high-responsibility profession, where poor sleep may impact clinical decision-making and focus.

Lastly, the study provides a useful baseline for future research exploring digital behaviour and sleep outcomes in nursing or other health-related disciplines, supporting long-term academic and personal well-being.

## **5.5 Recommendation**

For practice, it is recommended that nursing students adopt healthier screen time habits by setting limits on recreational screen use, especially before bedtime, and utilizing digital well-being tools such as screen time trackers or focus apps. Incorporating regular breaks, prioritizing academic tasks earlier in the day, and practicing proper sleep hygiene can help improve their sleep quality and overall well-being.

For education, universities should incorporate sleep health education and digital wellness into student support programs. This can be delivered through health talks, workshops, peer-sharing sessions, or digital reminders via student portals. Educating students on the impact of excessive screen time and poor sleep can empower them to develop better time management and healthier lifestyle habits.

For future research, it is recommended to explore additional factors influencing sleep quality, such as stress, mental health, or the type and timing of screen use. Expanding the study to include students from other faculties or universities can improve the generalizability of the findings. Longitudinal or experimental studies are also suggested to better understand causal relationships between screen use and sleep outcomes.

## **5.6 Limitations of The Study**

While this study provides meaningful findings, several limitations must be acknowledged. First, its cross-sectional design limits the ability to establish cause-and-effect relationships where while associations between screen time and sleep quality were explored, it cannot be determined whether one directly influences the other. Second, the use of self-reported data introduces the possibility of response bias, as participants may have underreported or overreported their actual screen time or sleep habits. Lastly, the sample was limited to undergraduate nursing students at UNIMAS, which may reduce the generalizability of the findings to students from other programs, institutions, or age groups.

## **5.7 Conclusion**

This chapter discussed the key findings of the study based on the research objectives. The first objective revealed that UNIMAS undergraduate nursing students spent a high amount of time on screens daily, with an average screen time of 14.70 hours. The second objective showed that the average sleep duration was 5.82 hours, which is below the recommended 7–9 hours, and the majority (72.4%) of students experienced poor sleep quality. However, the third objective found no statistically significant relationship between total screen time and sleep quality. While this differs from several previous studies, it suggests that other factors such as the type of screen use, time of day, or lifestyle habits, may play a larger role in affecting sleep quality.

Overall, these findings offer an opportunity for nursing students to reflect on their daily routines and develop healthier habits. By learning more about the importance of adequate sleep, managing screen time more effectively, and practicing good sleep hygiene, students can improve their physical and mental well-being, both during their studies and as future healthcare professionals.

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## APPENDICES

### Appendix A: Cover Letter for Ethical Application

**Nurasiah Nurul Ain binti Suli,**  
Faculty Medicine and Health Sciences,  
Universiti Malaysia Sarawak,  
94300 Kota Samarahan,  
Sarawak.

**The Chairman,**  
Medical Research Ethics Committee,  
Faculty Medicine and Health Sciences,  
Universiti Malaysia Sarawak,  
94300 Kota Samarahan,  
Sarawak.

15<sup>th</sup> December 2024

Professor/Associate Professor/Dr/Sir/Madam,

### REQUEST FOR APPROVAL TO CONDUCT RESEARCH PROJECT

I am a final-year student pursuing a Bachelor of Nursing with Honours at the Faculty of Medicine and Health Sciences, UNIMAS. I enrolled in MDJ 4653 Final Year Project I, in which the course is coordinated by Madam Shalin Lee Wan Fei. Please find my details as follows:

**Full name:** Nurasiah Nurul Ain binti Suli

**Matrix number:** 80745

**IC No.:** 011009-12-1460

I would like to request for the kind approval from the Faculty of Medicine and Health Sciences Medical Research Ethics Committee to conduct the following study:

**Research title:** The Relationship Between Screen Time and Sleep Quality Among UNIMAS Undergraduate Nursing Students

**Supervisor's name:** Feryante Rintika Anak Belansai

**Email address:** bferyante@unimas.my

**Supervisor's HP number:** 019-8894780

Please find the required documents as appended for your kind consideration and approval.

Thank you.

Yours sincerely,



(Nurasih Nurul Ain binti Suli)

## Appendix B: Participants Information Sheet (PIS)



### PARTICIPANT INFORMATION SHEET/ *MAKLUMAT KAJIAN PESERTA*

- 1. Title of the study/ *Tajuk kajian*** : **The Relationship Between Screen Time and Sleep Quality Among UNIMAS Undergraduate Nursing Students**
- 2. Main Researcher/ *Penyelidik utama*** : **Nurasiah Nurul Ain binti Suli**
- 3. Supervisor/ *Penyelia*** : **a) Course coordinator: Shalin Lee Wan Fei  
b) Main research supervisor: Feryante Rintika Anak Belansai**
- 4. Institution/ *Institut*** : **Department of Nursing  
Faculty of Medicine & Health Sciences  
Universiti Malaysia Sarawak**
- 5. Name of sponsor/ *Nama Penaja*** : **No external funding/ *Tiada penaja luar***

## **PARTICIPANT INFORMATION SHEET AND INFORMED CONSENT FORM**

(for adult subjects)

### **6. Introduction:**

It is important that you understand why the research is being done and what it involves. Please take your time to read through and consider this information carefully before you decide if you are willing to participate. Ask the study staff if anything is unclear or if you would like more information. After you are properly satisfied that you understand this study, and that you wish to participate, you must sign this informed consent form.

Your participation in this study is voluntary. You do not have to be in this study if you do not want to. You may also refuse to answer any questions you do not want to answer. If you volunteer to be in this study, you may withdraw from it at any time. If you withdraw, any data collected from you up to your withdrawal will still be used for the study. Your refusal to participate or withdrawal will not affect any medical or health benefits to which you are otherwise entitled.

This study has been approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia.

### **7. What is the purpose of the study?**

The purpose of this study is to find out how much time nursing students at UNIMAS spend on screens each day, how long they sleep on average, and whether their screen habits are affecting their sleep quality. This research is necessary to help nursing students understand their screen habits and their sleep quality. By identifying patterns, the findings can guide students toward healthier screen use and better sleep practices, improving their well-being and academic performance.

This research will be conducted for a duration of 6 months (25/1/2025 until 30/6/2025). The expected number of participants is 164 individuals.

### **8. What are my responsibilities when taking part in this study?**

It is important that you answer all of the questions asked by the study staff honestly and completely which will take about 10 to 15 minutes of your time. You will be given a

survey form to be answered. This form contains three sections which will enquire about sociodemographic, screen time and sleep quality topics.

**9. What are the potential risks and side effects of being in this study?**

Participation to this study will not affect your treatment, and the risk is minimal. You are free to decline to answer any of the questions that you feel uncomfortable with.

**10. What are the benefits of being in this study?**

There may or may not be benefits to you. Information obtained from this study will help you become more aware of your screen time and sleep quality. By understanding your screen usage and sleep patterns, you can adopt healthier screen habits and improve your sleep practices, which can enhance your overall well-being and academic performance.

**11. Who is funding the research?**

This study does not receive any external funding. You will not be paid for participating in this study.

**12. Who can participate in the research?**

The inclusion criteria for this research are undergraduate nursing students from Year 1 to Year 4 and willing to take part in the research. The exclusion criteria for this research are nursing students who have participated in the pilot study and students from other programs.

**13. Will my medical information be kept private?**

All your information obtained in this study will be kept and handled in a confidential manner, in accordance with applicable laws and/or regulations. When publishing or presenting the study results, your identity will not be revealed without your expressed consent. Individuals involved in this study, qualified monitors and auditors, and governmental or regulatory authorities may inspect the study data, where appropriate and necessary.

**14. Who should I call if I have questions?**

If you have any questions about the study or if you think you have a study related injury and you want information about this study, please contact the study doctor, Nurasiah Nurul Ain binti Suli at telephone number 013-8201587.

If you have any questions about your rights as a participant in this study, please contact: The Secretary, Medical Research & Ethics Committee, Ministry of Health Malaysia, at telephone number 03-3362 8407/8205/8888.

## Appendix C: Informed Consent

### INFORMED CONSENT FORM

Title of Study: *The Relationship Between Screen Time and Sleep Quality Among UNIMAS Undergraduate Nursing Students*

By signing below I confirm the following:

- I have been given oral and written information for the above study and have read and understood the information given.
- I have had sufficient time to consider participation in the study and have had the opportunity to ask questions and all my questions have been answered satisfactorily.
- I understand that my participation is voluntary and I can at anytime free withdraw from the study without giving a reason and this will in no way affect my future treatment. I am not taking part in any other research study at this time. I understand the risks and benefits, and I freely give my informed consent to participate under the conditions stated. I understand that I must follow the study doctor's (investigator's) instructions related to my participation in the study.
- I understand that study staff, qualified monitors and auditors, the sponsor or its affiliates, and governmental or regulatory authorities, have direct access to my medical record in order to make sure that the study is conducted correctly and the data are recorded correctly. All personal details will be treated as STRICTLY CONFIDENTIAL
- I will receive a copy of this subject information/informed consent form signed and dated to bring home.
- I agree/disagree\* for my family doctor to be informed of my participation in this study. (*\*delete which is not applicable*)

#### **Subject:**

Signature:

I/C number:

Name:

Date:

#### **Investigator conducting informed consent:**

Signature:

I/C number:

Name:

Date:

**Impartial witness:**

Signature:

I/C number:

Name:

Date:

## Appendix D: Questionnaire

### Section 1: Demographic

Please fill-in and tick the most suitable answer.

Matric number: \_\_\_\_\_

Age: \_\_\_\_\_

Gender:

- Male
- Female

Race:

- Melayu
- Cina
- India
- Bumiputera Sabah
- Bumiputera Sarawak

Years of study:

- Year 1
- Year 2
- Year 3
- Year 4

Number of devices:

- 1
- 2
- 3
- 4
- 5

Types of devices: (You may choose more than one answer)

- Smartphone
- Tablet
- Laptop
- Television
- Video console

## Section 2: Screen time

Please tick the most suitable answer.

### Weekdays

	<b>Nothing</b>	<b>Until ½ hour</b>	<b>½ to 1 hour</b>	<b>1 to 2 hours</b>	<b>2 to 3 hours</b>	<b>3 to 4 hours</b>	<b>More than 4 hours</b>
How many hours do you spend on smartphone?							
How many hours do you spend on tablet?							
How many hours do you spend on laptop?							
How many hours do you spend on television?							
How many hours do you spend on video console?							
How many hours do you spend surfing internet for study reasons?							
How many hours do you spend surfing internet for non-study reasons?							

### Weekends

	<b>Nothing</b>	<b>Until ½ hour</b>	<b>½ to 1 hour</b>	<b>1 to 2 hours</b>	<b>2 to 3 hours</b>	<b>3 to 4 hours</b>	<b>More than 4 hours</b>
How many hours do you spend on smartphone?							
How many hours do you spend on tablet?							
How many hours do you spend on laptop?							
How many hours do you spend on television?							

How many hours do you spend on video console?							
How many hours do you spend surfing internet for study reasons?							
How many hours do you spend surfing internet for non-study reasons?							

**Section 3: Sleep Quality**

- 1) What time do you usually go to bed?
  - Before 9PM
  - 9PM – 10PM
  - 10PM – 11PM
  - After 11PM
  
- 2) How long usually taken you to fall asleep each night?
  - < 15 minutes
  - 15 – 30 minutes
  - 30 – 60 minutes
  - > 60 minutes
  
- 3) What time do you usually gotten up in the morning?
  - Before 5AM
  - 5AM – 6AM
  - 6AM – 7AM
  - After 7AM
  
- 4) How many hours of actual sleep do you get at night?
  - > 7 hours
  - 6-7 hours
  - 5-6 hours
  - < 5 hours
  
- 5) How often do you have trouble sleeping because you:

	<b>Not during the past month</b>	<b>Less than once a week</b>	<b>Once or twice a week</b>	<b>Three or more times a week</b>
Can't get to sleep within 30 minutes				
Wake up in the middle of night or early morning				
Have to get up to use the bathroom				
Can't breathe comfortably				
Cough or snore loudly				
Feel too cold				
Feel too hot				
Had bad dreams				
Have pain				
Other reasons				

- 6) How would you rate sleep quality?
- Very good
  - Fairly good
  - Fairly bad
  - Very bad
- 7) How often do you take medicine to help fall asleep? (prescribed or over the counter)
- Not during the past month
  - Less than once a week
  - Once or twice a week
  - Three or more times a week
- 8) How often do you have trouble staying awake while driving, eating meals, or engage in social activity?
- Not during the past month
  - Less than once a week
  - Once or twice a week
  - Three or more times a week
- 9) How much of a problem has it been for you to keep up enough enthusiasm to get things done?
- Not during the past month
  - Less than once a week
  - Once or twice a week
  - Three or more times a week

## Appendix E: Permission Obtained from Original Author to Use Questionnaire

### Seeking Permission to Use Questionnaire fo Final Year Project (FYP)

---

**From** NURASIAH NURUL AIN BINTI SULI <80745@siswa.unimas.my>

**Date** Sun 1/5/2025 11:47 PM

**To** buyssedj@upmc.edu <buyssedj@upmc.edu>

Greetings,

I am Nurasiah Nurul Ain binti Suli, a final year Bachelor of Nursing student at the Universiti of Malaysia Sarawak (UNIMAS) and will be conducting research entitled "The Relationship between Screen Time and Sleep Quality among UNIMAS Undergraduate Nursing Students" as my final year project. I am writing to ask permission to use the instruments that are related with sleep quality which is the PSQI questionnaire in my research study. My research will be conducted quantitatively with a sample size of around 164 UNIMAS undergraduate nursing students.

I plan to utilize the research instruments and adapt its questionnaires in my research study, as they are fit to measure my research questions. A survey with consent will be distributed among the students, and statistical analysis will be conducted using IBM SPSS version 27.0 software.

I would also appreciate receiving scores of:

1. the test questionnaires/questions list for both screen time and sleep quality.
2. scoring procedures and
3. total scores for preparedness level and comfort level questionnaires and their range and indications.

I would like to use (and reproduce) your research instrument under the following conditions:

1. I will use the instruments only for my research study and will not sell or use it for any other purposes.

If you do not control the copyright of these materials, I would appreciate any information you provide concerning the proper person or organisation I should contact. If these are acceptable terms and conditions, please indicate so by replying to me through this message or e-mail at [nurulainnurasiah@gmail.com](mailto:nurulainnurasiah@gmail.com)

---

## Permission to use the PSQI

1 message

University of Pittsburgh Center for Sleep and Circadian Science <noreply@qualtrics-research.com>

9 January 2025 at 22:16

Reply-To: University of Pittsburgh Center for Sleep and Circadian Science <trigger@qemaiserver.com>  
To: nurulainnurasiah@gmail.com

Dear Nurasiah Nurul Ain,

Thank you for your interest in the PSQI. You have permission to use the PSQI in the non-commercially funded research or educational project described in your request. **This permission extends only to the specific project described in your request.** You will need to submit a separate request if you would like to use the PSQI in other projects. Permission to use the PSQI has the following provisions:

**1. Electronic format:** If you plan to administer the PSQI in electronic format, you must ensure that the questions and responses are faithfully reproduced from the original form. We do not have the PSQI available in an electronic format for distribution. Do not distribute the PSQI in electronic format to any other individuals and groups outside of your specific request.

**2. Translations** are distributed through an agreement with MAPI Research Trust. The website (<https://eprovide.mapi-trust.org/>) will indicate what languages they have on file. You will need to work with them to obtain any necessary translations. They will collect the proper user agreement. We do not know if they have the required translation on file. You will need to contact MAPI for that information. If the translations you need are unavailable, MAPI can provide them for a cost. You will need to contact them for the exact price. If you have trouble obtaining the translations, let us know.

If you translate the PSQI yourself, translations must use established linguistic validation methods including (but not limited to) cognitive interviews, translation, and back-translation by two bi-lingual speakers.

All translations remain property of the University of Pittsburgh. They are considered derivative works of the original work.

**3. Referencing:** All publications, presentations, reports, or developments resulting from or relative to the use of this material must be referenced as follows:  
The Pittsburgh Sleep Quality Index: A New Instrument for Psychiatric Practice and Research (Authors Daniel J. Buysse, Charles F. Reynolds III, Timothy H. Monk, Susan R. Berman, and David J Kupfer, © University of Pittsburgh 1989)

**General information** regarding the PSQI, including the instrument, original article, and scoring information, is available at our website, Pittsburgh Sleep Quality Index.

To access the PSQI Scoring Database, email Christina at [vachosc@upmc.edu](mailto:vachosc@upmc.edu).

Note that Question 10 is not used in scoring the PSQI. This question is for informational purposes only, and may be omitted during data collection per requirements of the particular study.

<https://mail.google.com/mail/u/0/?ik=4631b28c41&view=pt&search=all&permthid=thread-f:1820781139879568373&simpl=msg-f:18207811398795...> 1/3

---

1/23/25, 2:20 PM

Gmail - Permission to use the PSQI

Good luck with your research!

Sincerely,

---

## Seeking Permission to Use Questionnaire fo Final Year Project (FYP)

---

**From** NURASIAH NURUL AIN BINTI SULI <80745@siswa.unimas.my>

**Date** Mon 1/6/2025 12:09 AM

**To** jpreylopez@hotmail.com <jpreylopez@hotmail.com>

Greetings,

I am Nurasiah Nurul Ain binti Suli, a final year Bachelor of Nursing student at the Universiti of Malaysia Sarawak (UNIMAS) and will be conducting research entitled "The Relationship between Screen Time and Sleep Quality among UNIMAS Undergraduate Nursing Students" as my final year project. I am writing to ask permission to use the instruments that are related with screen time which is the HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence) screen time-based sedentary behavior questionnaire in my research study. My research will be conducted quantitatively with a sample size of around 164 UNIMAS undergraduate nursing students.

I plan to utilize the research instruments and adapt its questionnaires in my research study, as they are fit to measure my research questions. A survey with consent will be distributed among the students, and statistical analysis will be conducted using IBM SPSS version 27.0 software.

I would also appreciate receiving scores of:

1. the test questionnaires/questions list for both screen time and sleep quality.
2. scoring procedures and
3. total scores for preparedness level and comfort level questionnaires and their range and indications.

I would like to use (and reproduce) your research instrument under the following conditions:

1. I will use the instruments only for my research study and will not sell or use it for any other purposes.

If you do not control the copyright of these materials, I would appreciate any information you provide concerning the proper person or organisation I should contact. If these are acceptable terms and conditions, please indicate so by replying to me through this message or e-mail at [nurulainnurasiah@gmail.com](mailto:nurulainnurasiah@gmail.com)

## Appendix F: Gantt Chart

Activity	Months											
	2024				2025							
	Sept	Oct	Nov	Dec	Jan	Feb	Mac	Apr	May	June	July	
Determination of research title	█											
Literature review		█	█									
Meeting with supervisor		█	█	█	█	█	█	█	█	█	█	█
Submission of proposal defence slides				█								
Ethical approval					█							
Submission of the first draft					█							
FYP 1: Submission of research proposal					█							
Data collection						█						
Data analysis							█					
Writing up report								█				
Submit final report									█	█	█	
FYP 2: Submission of final report												█

## Appendix G: Budget

Budget			
Project title	The Relationship Between Screen Time and Sleep Quality Among UNIMAS Undergraduate Nursing Students		
Duration of the project	October 2024 - July 2025		
Items	Unit price (RM)	Quantity	Amount (RM)
Printing slide presentation for proposal defence	0.50/page	2 sets	20
Printing for poster	40	1	40
Printing and binding for FYP written report	0.50/page	1 set	60
SPSS Software	5	1	5
Internet data	35	9 months	351
Total amount			RM 476

## Appendix H: Turnitin Report

ORIGINALITY REPORT			
19%	15%	10%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS
PRIMARY SOURCES			
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