

**Evening Smartphone Usage and Sleep Quality Among BSIT Students in
STI College Malolos: Basis for a Sleep Tracking and Academic Schedule
Management Web Application**

A Research Presented to the Faculty of the

Senior High School Department

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LIST OF ABBREVIATIONS

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| 4. MEQ - Morningness-Eveningness Questionnaire | 8 |
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CHAPTER I

INTRODUCTION

The rapid advancements of technology have led to a growing dependence on digital devices in everyday life. From communications to entertainment, technology has become deeply integrated into modern routines, especially among students. However, this dependence has also introduced new challenges, particularly concerning the excessive use of smartphones. The daily, prolonged use of smartphones has given rise to numerous concerns, including the risk of smartphone addiction, negative effects on mental well-being, and a decline in sleep quality; especially nowadays that smartphones are more accessible than ever to students. The University of Texas Permian Basin (n.d.) concludes that smartphones tend to be addictive; every time we use them, it triggers a surge of dopamine in our brains. It hooks our brain and teaches it to keep on wanting more, leading to a cycle of constant use.

This growing dependence on smartphones has led to concerns about their effect on students' health and well-being. One area of particular interest is evening smartphone usage and how it relates to sleep quality. A study by Exelmans & Van den Bulck (2016) suggests that exposure to smartphone screens right before bedtime can disrupt one's circadian cycles, reduce sleep duration, and worsen sleep quality. Evening smartphone use is expected to affect sleep more strongly than general use because screen exposure right before bedtime disrupts melatonin production and delays the body's natural sleep cycle. Unlike daytime activity, nighttime use also increases cognitive stimulation through messaging, browsing, or gaming, which keeps the brain alert instead of winding down. Studies such as Exelmans & Van den Bulck (2016) show that this screen exposure before sleeping has a more immediate impact on sleep quality compared to overall daily use. For

BSIT students, who often continue using their phones for academic tasks and personal activities late at night, evening smartphone use becomes especially relevant in explaining their sleep disruptions. This issue is especially significant for Bachelor of Science in Information Technology (BSIT) students who often balance heavy academic workloads with prolonged smartphone use.

1.1 Background of The Study

The prolonged use of smartphones at night, which affects an individual's sleep quality, is also perceivable in the Philippines, especially among high school students. A study conducted by Buctot, Kim, & Kim (2020) found that the rate of smartphone addiction among Filipino high school students was 62.6%, whereas males had 66.2% and females had 60.2%. Their study shows that the prevalence rate of smartphone addiction among Filipino students is high. Susmitha, Rao, & Doshi (2024) found that smartphone addiction is positively correlated with poor sleep quality and negatively correlated with mental well-being. This study seeks to specifically understand whether evening smartphone use may be related to the sleep quality of BSIT students.

Previous studies have linked smartphone addiction to poor sleep quality. However, there is a limited number of studies that directly measure the relationship between evening smartphone use and sleep quality using data-driven evidence. Most existing studies incorporate other variables, such as smartphone addiction, thereby broadening the scope of existing studies. There is a limited amount of existing studies aiming to apply collected data into a conceptual web application used for proposing practical interventions. This study seeks to fill these gaps by providing a quantitative analysis of the direct correlation between evening smartphone usage and sleep quality for

students and also by developing a conceptual web application prototype that promotes improved sleep quality.

1.2 Research Questions

This study, therefore, seeks to determine the correlation between evening smartphone usage and sleep quality among BSIT students in STI College Malolos. Specifically, it aims to answer the following questions:

- What is the extent of evening smartphone usage among BSIT students in STI College Malolos?
- What is the level of sleep quality among these students as measured through a Likert-type quantitative sleep assessment scale?
- Is there a significant relationship between evening smartphone usage and sleep quality among BSIT students in STI College Malolos?
- How can a conceptual prototype of a web application be used to assist students in their evening smartphone usage and managing their sleep patterns?
- What features may be included in a conceptual prototype of a web application that assists students in tracking evening smartphone usage and managing their sleep?

1.3 Significance of the Study

The purpose of this study is to provide information on the correlation of evening smartphone usage and sleep quality among BSIT students at STI College Malolos. The findings of this study will be beneficial to the following:

For Students. This study will help them become more aware of how their evening smartphone habits affect their sleep quality, academic performance, and overall

well-being. By understanding the risks, they may adopt healthier routines and improve their daily productivity.

For Teachers. The findings will provide them with insights into how evening smartphone use influences student alertness, attention, and classroom performance. This may help them adjust teaching strategies, workloads, or reminders on healthy study habits.

For Parents and Guardians. The results will guide them in monitoring and supporting their children's smartphone use, especially at nighttime. This can encourage the development of balanced routines that prioritize rest without completely restricting technology.

For School Administrators. This research may serve as a basis for school programs or policies promoting digital wellness, sleep hygiene, and responsible smartphone use among BSIT students.

For Public Health Officials. The findings may contribute to programs aimed at reducing sleep-related problems among adolescents by addressing digital device use as a key factor in youth wellness.

For Psychologists. The study can provide them with valuable data on the behavioral and emotional effects of late-night smartphone use on students, which may inform counseling approaches and interventions.

For Future Researchers. This study will serve as a reference for future researchers exploring the effects of technology on health and education. It may inspire more in-depth studies on smartphone use, sleep, and adolescent well-being in both local and broader contexts.

General Objective:

- To analyze and investigate the relationship between evening smartphone usage and sleep quality among BSIT students in STI College Malolos.

Specific Objectives:

1. To analyze the extent of evening smartphone usage of BSIT students using a self-administered questionnaire.
2. To evaluate the level of sleep quality of BSIT students using the Pittsburgh Sleep Quality Index (PSQI).
3. To conceptualize and design a prototype of a web application that will actively assist students in forming healthier sleep patterns.

1.4 Review of Related Literature

This chapter presents the literature and studies that provide background for the present research, focusing on evening smartphone usage and its impact on sleep quality, the behavioral implications of smartphone addiction, the mental health consequences of poor sleep quality, and the physical and emotional consequences of smartphone addiction. The reviewed literature includes both foreign and local studies to provide a comprehensive understanding of our topic. This chapter identifies gaps and justifies the need for the present study.

Theme/Concept 1: Impact of Evening Smartphone Usage on Sleep Quality

This theme focuses on how evening smartphone usage affects sleep quality. While several foreign and local studies have shown that evening smartphone usage affects sleep quality, there still remains a limited understanding of how this behavior manifests among BSIT students within our locality. Our study addresses this gap by examining the direct

relationship difference between evening smartphone use and sleep quality among BSIT students.

Foreign Literature

Evening usage of mobile smartphones impacts sleep quality, mainly because most people who use smartphones are getting addicted and cannot maintain discipline to stay away from using an electronic device before bed. This issue is more prominent with lower age groups, which is a serious matter of concern (Ghosh et al., 2021). Due to the widespread presence of the internet and the ever-continuing innovation of smartphones, most people have easier access to the many features that phones include—social media, messaging, video content, games, and other forms of content (Demirci et al., 2015). The sleep disruption starts in the light-emitting diode (LED) screens of these devices, which interfere with our body's natural circadian rhythm and affect our sleep quality. (Randjelović et al., 2018).

The study by Pham et al. (2021) investigated the impact of electronic device use before bedtime on sleep time among university students. The cross-sectional study included 369 undergraduate students in Vietnam across different departments, recruited by convenience sampling. The researchers used a self-administered structured questionnaire to gather the lifestyle behaviors: device type, screen brightness, and usage duration of their electronic devices; and to assess their sleep quality through the Pittsburgh Sleep Quality Index (PSQI). The study found that almost 48.8% of university students experienced poor sleep quality due to their usage of smartphones. It is also reported that 98.1% use at least one type of electronic device two hours before sleep time—92.3% of them were smartphones. Within that two-hour duration, many students

used their electronic devices for more than 30 minutes, which is associated with the poorer sleep quality that students within the population have compared to the students who don't use electronic devices at all within that two-hour window.

Local Literature

Similarly, in the context of the Philippines, Distor, Cabello, and Tus (2022). The study focuses on freshmen college students and how social media relates to sleep in the new norm. The study included 385 freshman students from various tertiary institutions in the Philippines. The researchers used online self-report survey methods, such as Google Forms, to gather data on the students' levels of social media use through the Social Media Addiction Scale (SMAS) and their sleep quality through the Pittsburgh Sleep Quality Index. The study found that social media usage and sleep quality have a significant correlation. The researchers interpreted this as having a strong positive correlation ($r = 2.83$), that having a higher social media usage will result in having worse sleep quality. Results also showed that long hours on social media often lead to late bedtimes and body clock disruption. It was explained that high engagement with online platforms interferes with rest and everyday tasks.

Both studies consistently reveal that excessive use of smartphone usage at night or social media use negatively affects sleep quality, especially among students. Ghosh et al. (2021) and Randjelović et al. (2018) found that the problem stems from both psychological dependence on smartphones and the physiological effects of LED light disrupting the circadian rhythm. These findings are supported by the study of Pham et al. (2021), whose findings among Vietnamese university students confirm that most of them experienced poor sleep quality due to late-night screen exposure. Locally, the study of

Distor, Cabello, and Tus (2022) reinforces these findings revealing a strong positive correlation between social media use and poor sleep quality among college students. Similar to the foreign studies, the local research attributes these problems to delayed bedtimes and disrupted circadian rhythm due to prolonged screen-on time.

Together, these studies indicate that the negative relationship between the two variables transcends cultural and national boundaries. Both groups of studies identify the population's behavioral dependence and physiological disruption as key factors. Overall, these findings suggest that both foreign and local settings share the same issue of smartphone overuse and other similar factors.. This alignment across settings supports the conclusion that managing smartphone use during nighttime is crucial to improving sleep quality.

Theme/Concept 2: Correlation of Smartphone Addiction on Behaviors

This theme examines smartphone addiction and its links to human behavior and lifestyle. Although numerous studies have approached this topic, there is a lack of deeper analysis on how specific practices contribute to smartphone addiction and lead to poor sleep quality. We aim to bridge the gap by looking into the extent of smartphone use at night and behavioral factors that encourage it.

Foreign Literature

The study by Hasan et al. (2023) investigated the association of poor sleep quality between smartphone addiction and eating behaviors. They also included the relevance of an individual chronotype and circadian preference, which may have some association with smartphone behaviors and sleep quality. The study included 552 students from the University of Sharjah via convenience sampling. The researchers used cross-sectional

survey using self-administered online questionnaires and distributed it online to gather information about the student's level of smartphone addiction through the Smartphone Addiction Scale - Short Version (SAS-SV), their sleep quality through the Pittsburgh Sleep Quality Index (PSQI), their chronotype through the Morningness-Eveningness Questionnaire (MEQ), and their risks of eating disorders through the Eating Attitude Test (EAT-26). The study found that 56.2% were classified at risk of smartphone addiction, 71% of the participants had poor sleep quality, 33.9% of them were classified as evening chronotype; the rest being morning or intermediate, and 37.9% were screened positive for risks of eating disorders. It was also found that risks of smartphone addiction and poor sleep quality were significantly associated. Students with risks of smartphone addiction were nearly 2.93 times more likely to have poor sleep quality (OR = 2.93, 95% CI: 2.01 – 4.29, $p < 0.001$), and this was more common among those classified as evening chronotype ($p = 0.005$). Therefore, it proves that risks of smartphone addiction are associated with an individual's sleep quality and chronotype.

Local Literature

In the local context, Buctot, Kim, and Kim (2021) studied smartphone addiction and the way it affects lifestyle among Filipino high school students. The study included 1,388 Filipino senior high school students from Grades 11-12. The researchers used self-administered online questionnaires via Google Forms in order to collect the students' levels of smartphone addiction, adolescent lifestyle profiles, and health-related quality of life. Findings showed that smartphone addiction has a negative correlation with a student's lifestyle profile and quality of life. The mediation analyses found that adolescent lifestyle profiles have significantly mediated the correlation between smart-

phone addiction and a student's quality of life for both male and female students, but these are more profound within females. Because of this, the overall quality of life goes down. The research highlighted how lifestyle becomes a big part of the link between smartphone use and well-being.

Both studies reveal that smartphone addiction has significant effects on students' overall well-being, particularly in relation to sleep and lifestyle. These studies demonstrate that smartphone addiction impacts both sleep patterns and lifestyle behaviors leading to worsening health conditions in physical and mental means. The foreign literature highlights the biological and psychological means, such as an individual's circadian rhythm where it is disrupted due to smartphone overuse. Locally, evidence like these are also found, especially within the behavioral and social consequences that an individual experiences due to excessive smartphone usage. These findings highlight the overall negative effects of smartphone addiction, emphasizing the need for better awareness and discipline to maintain a healthy lifestyle.

Theme/Concept 3: Consequences of Poor Sleep Quality on Mental Health

This theme shows the relationship between poor sleep quality, mental health, and psychological well-being. While previous research has consistently linked poor sleep quality to negative mental health, few local studies have examined this relationship. We aim to fill this gap by providing further research on how poor sleep quality due to smartphone use can impact students' mental health in the locality.

Foreign Literature

Poor sleep quality can have its consequences due to delayed sleep latency and decreased sleep duration caused by uncontrolled smartphone usage. These inconsistent

sleep schedules associated with smartphone addiction may have negative health consequences over the long term (Zhang & Wu, 2020). The study by Ghrouz et al. (2019) investigated the relationship between physical activity and sleep quality with mental health, specifically anxiety and depression, among students. The study included 617 college students in India within the age range of 18-30 years old. The researchers used a cross-sectional survey to gather information about the sociodemographic data of the participants, their sleep quality through the Pittsburgh Sleep Quality Index (PSQI), and the levels of their mental health through the Hospital Anxiety and Depression Scale (HADS). The study shows the prevalence of anxiety, which amounts to 30% of the total participants, while 18% of them had depression. The study reported that 51% also had poor sleep quality, which was positively associated with both anxiety ($OR \sim 1.30$) and depression ($OR \sim 1.58$). The students who had better sleep quality are less likely to have symptoms of anxiety and depression compared to those who had poor sleep quality—proving that sleep is a critical factor for mental health.

Local Literature

In the Philippines, Chan, Sarte, Sze, Talampas, & Azcarraga (2023) also investigated how technology, such as social media and streaming services, affects students. The study included 30 STEM senior high school students. The researchers gathered information on the frequency and duration of IT service usage, perceived sleep quality, and their academic performance. The data were collected during three quarters of the school term. The students reported that technology can help as a coping tool when academic stress is heavy, but at the same time, sleep gets disrupted. The study showed that technology can be both useful and harmful at once.

Both studies emphasize the relationship between smartphone use, sleep quality, and overall well-being among students. These studies show that poor sleep quality is not only due to a result of late-night phone usage but also a factor in broader issues such as mental health problems and academic challenges. The foreign literature highlights the psychological implications of poor sleep quality, which is seen as strong evidence that evening smartphone usage is also associated. Locally, these contexts are also found within Filipino students experiencing both comfort and disruption when using a device in their real-world experiences. These findings accentuate the importance of promoting responsible use of technology to protect the students' overall mental well-being.

Theme/Concept 4: Implications and Consequences of Overusing Smartphones

This theme discusses the physical and emotional health consequences of smartphone overuse. While several studies have discussed these consequences, there remains insufficient local research regarding them. Therefore, this study seeks to contribute to the existing knowledge by offering more understanding of how smartphone addiction influences students' overall well-being.

Foreign Literature

The study of Xie et al. (2018) also showed the significance of an individual's sleep quality, problematic smartphone use, and clinical health symptoms. The study included 429 Chinese undergraduate students from Changsha Health Vocational College. The researchers used a cross-sectional survey that included correlational and mediation models to gather the levels of problematic smartphone use through a self-report scale, sleep quality through the Pittsburgh Sleep Quality Index (PSQI), and clinical health symptoms using the Cornell Medical Index. The study shows that there is a high rate of

students who experience problematic smartphone usage ($M = 38.90$, $SD = 9.41$). Most students also have good sleep quality, as the scores ($M = 4.99$, $SD = 2.31$) were below the Pittsburgh Sleep Quality Index (PSQI) cutoff point of 8 for poor sleep. The students also reported a moderate level of physical and emotional health complaints ($M = 7.20$, $SD = 4.65$). Even so, problematic smartphone usage and sleep quality have a positive correlation ($r = 0.35$, $p < 0.001$). The study also indicated a positive association between problematic smartphone usage and clinical health symptoms ($r = 0.31$, $p < 0.001$). The mediation analysis conducted showed a partial association between problematic smartphone use and health symptoms. It showed that students with higher levels of problematic smartphone use have poorer sleep quality, which is linked to more health symptoms. Even after accounting for sleep quality, problematic smartphone usage itself still had a direct effect on clinical health symptoms.

With the results showing that evening smartphone usage affects the sleep quality of an individual, the promotion of a smartphone-free bedroom environment is an effective strategy to mitigate an individual's smartphone addiction, enhance sleep quality, and reduce other effects that can be associated with this addiction (Almalki et al., 2025b).

Local Literature

Problematic smartphone use and sleep disorders have been observed and seen as having a positive association. Stress, fatigue, and vision problems were also listed as results of overusing smartphones. Smartphone overuse is not a small issue but an urgent public health matter in the Philippines (Priya & de Guzman, 2023). The most recent study was from Pucyutan (2025). The study explored loneliness, smartphone use, and bedtime procrastination among adolescents in Batangas. Findings revealed that loneliness had a

strong connection with bedtime procrastination. The study included 202 adolescent students aged 12-19 years old in Tanauan City. The researchers used simple random sampling to gather information about emotional and social loneliness, bedtime procrastination, and smartphone usage of the students. The students reported that they experience both emotional and social loneliness. They also had an elevated level of bedtime procrastination with a low positive association with emotional and social loneliness ($r = 0.321$, $p = .000$). However, smartphone use did not change that relationship. It was still reported that emotional and social loneliness was still prevalent even when students use their smartphones, concluding that digital connections cannot fully fix emotional struggles.

Both studies highlight the relationship between problematic smartphone usage, sleep quality and overall well-being, though both perspectives approach the issue differently. These studies found that problematic smartphone use affects both physical and emotional well-being. The foreign literature highlights the effects of smartphone addiction on mental health and sleep, such as clinical health symptoms and loneliness, which contribute to irregular sleep cycles. In the local context, the studies reveal the social and emotional factors, such as loneliness and stress. These studies emphasize the need for self-regulation and awareness to alleviate sleep problems and improve well-being.

Synthesis of Literature

Based on the reviewed literature, it is evident that excessive smartphone use, especially during nighttime, has consequential effects on sleep quality, behavior, and mental well-being. Both foreign and local studies consistently show how evening smart-

smartphone usage disrupts circadian rhythm, decreases sleep duration, and leads to poor overall rest. Research also revealed that smartphone addiction is linked with negative behavioral patterns. Furthermore, poor sleep quality has been shown to contribute to anxiety, depression, and emotional distress among students. Despite the abundance of research on smartphone addiction and sleep, there remains a gap in measurable and quantitative data on how these relationships become apparent among BSIT students in the Philippines.

The present study will address these gaps by quantitatively examining the relationship between smartphone use and sleep quality, focusing on measurable data. This research aims to contribute empirical data that can serve as a basis for a conceptual prototype of a web application that assists students in tracking evening smartphone usage and managing their sleep.

1.5 Theoretical/Conceptual Framework

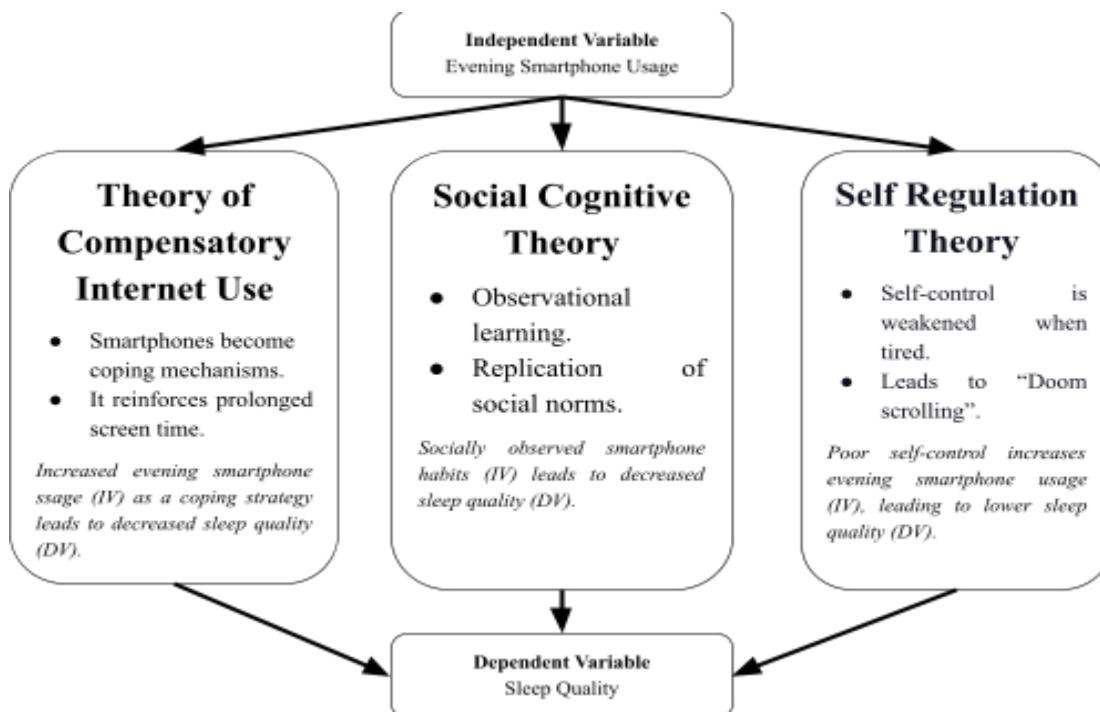


Figure 1: Diagram of the Theory-Based Framework of the Study, which serves as a base of this research to guide the systematic flow of the study.

This study is anchored on three primary theoretical perspectives that will show the correlation of evening smartphone usage to the sleep quality of BSIT students in STI College Malolos. These three theories are the *Theory of Compensatory Internet Use*, *Social Cognitive Theory*, and *Self-Regulation Theory*.

The first theory, the **Theory of Compensatory Internet Use**, proposed by Kardefelt-Winther (2013), states that individuals often turn to online activities to cope with different negative factors they experience in their offline lives. People usually have unmet offline needs: low self-esteem, academic or work stress, emotional dysregulation, anxiety, etc. To alleviate these needs, they use their smartphones as coping mechanisms—providing immediate relief or substitutes for what they lack offline. This theory directly explains that individuals often use the internet or smartphones to cope with stress, loneliness, or negative emotions. For BSIT students, evening smartphone usage may serve as a coping mechanism for their academic stress; because smartphone usage provides temporary comfort, this behavior may become repetitive and escalate to an addiction, which may prolong the screen time of an individual and decrease their sleep quality.

Adding to this, **Self-Regulation Theory**, proposed by Baumeister & Vohs (2007), explains how individuals control their thoughts, emotions, and behaviors in order to achieve long-term goals, basically a drive to keep their discipline. This self-control is limited and may be depleted when an individual is tired, stressed, distracted, or simply unmotivated to continue their work to achieve their goal. This theory explains how indi-

viduals deplete self-control when tired or stressed, which can lead to individuals scrolling on their phones more before sleeping, which is a known behavior called “doom scrolling.” This lack of self-regulation, for BSIT students, may prolong screen time, delay sleep, and reduce sleep quality.

Finally, **Social Cognitive Learning Theory**, proposed by Bandura (1986, as cited in Tadayon & Bijandi, 2017), suggests that an individual does not learn solely through direct experience but also through observation of other individuals, peers, or even their own parents who practice a certain behavior, which may be perceived as a norm. The principle of Bandura’s Social Cognitive Learning Theory states that human behavior revolves around the continuous interaction between different factors, which is called *Reciprocal Determinism*. These different factors consist of three interacting elements, termed *Triadic Reciprocity*, which are:

1. *Personal Factors (cognitive, emotional, and biological processes)*
2. *Behavior (actions, decisions, and performance of an individual)*
3. *Environmental Factors (social influences, physical surroundings, cultural norms)*

There are four key features proposed by Bandura (1986) on how individuals acquire certain behaviors within the different factors mentioned above. We can relate these features to how an individual is tempted to use their smartphone by their observation of their surroundings.

1. *Attention.* An individual must first notice another individual who uses a smartphone before bedtime.
2. *Retention.* An individual must remember certain behavior, such as smartphone usage, in order to replicate it later.

3. *Reproduction.* An individual as a learner must be physically and cognitively capable of using smartphones before bedtime.
4. *Motivation.* An individual as a learner must have a concrete reason for why they need to use their smartphones before bedtime.

This theory explains that individuals often use the internet or smartphones to cope with stress, loneliness, or other negative emotions. For BSIT students, evening smartphone usage may serve as a coping mechanism for academic stress. This behavior may increase evening smartphone usage and delay bedtime, thereby reducing sleep quality.

1.6 Summary

This chapter reviewed foreign and local studies related to smartphone use, sleep quality, behavioral patterns, and overall well-being. The findings consistently show a relationship between smartphone addiction and poor sleep quality and mental health-related issues. However, gaps remain in understanding these relationships among the BSIT students in the locality, and the absence of measurable data regarding this topic.

The literature review provides the foundation for the present quantitative study by identifying key variables, validated instruments, and established correlations. It supports the need for empirical and measurable data regarding how evening smartphone use specifically affects the sleep quality of BSIT students.

CHAPTER II

METHODOLOGY

2.1 Overview

This chapter presents the methodology of the study, including the Research Design, Research Locale, Research Instrument, Population and Sampling, Data Gathering Procedures, and Ethical Considerations. The goal of this chapter is to provide a clear explanation of how data is going to be collected, processed, and ethically handled throughout the study to ensure accuracy, reliability, and integrity of the findings.

2.1.1 Definition of Variables

Evening smartphone usage refers to the total time and frequency of smartphone use within 7:00 PM - 12:00 MN. This will be measured quantitatively using a Likert-type assessment scale. Sleep quality refers to the global Pittsburgh Sleep Quality Index (PSQI) score. Respondents will answer the standard PSQI questions, which are quantitatively scored according to Buysse et al. (1989). The global PSQI score will be calculated for each respondent, where higher scores indicate poorer sleep quality.

2.2 Research Design

This study will employ a quantitative correlational research design to determine the relationship between two variables using numerical data and statistical analysis. The dependent variable is the sleep quality of BSIT students at STI College Malolos, while the independent variable is evening smartphone use.

This design is appropriate because the study aims to determine whether there is a significant relationship between students' sleep quality and the amount of time they spend using their smartphones at night. It does not involve manipulating variables but

rather observes and measures existing behaviors and conditions. To analyze the relationship between the two variables, the study will use the Pearson Product-Moment Correlation Coefficient, a statistical method appropriate for determining the strength and direction of the linear relationship between two continuous variables.

The data will be screened to ensure it meets the statistical assumptions of the Pearson Product-Moment Correlation Coefficient. Linearly related data is going to be a primary requirement; therefore, the researchers will generate scatterplots for each pair of variables to visually inspect that the relationship follows a straight line and linear pattern rather than a curve.

Through this approach, the researchers can identify patterns or associations between evening smartphone habits and sleep quality, providing data to support the development of the proposed Sleep Tracking and Academic Schedule Management Web Application.

2.3 Research Locale

In conducting this research, we chose STI College Malolos for its technology-oriented practices, where students actively engage with technology in learning and completing tasks and activities. One of the programs this school has to offer includes the Bachelor of Science in Information Technology (BSIT), where the school also provides facilities, including Computer Laboratories for immersive learning for the students.

BSIT students were chosen as respondents because they carry heavier digital demands than other programs. Camarista et al. (2025) note that BSIT students handle “heavier digital workloads” and “complex technical requirements,” including program-

ming exercises, online labs, and computational tasks, leading to longer and more frequent use of technology devices. This will align with the findings of Huang et al. (2023), who reported that students with high mobile phone dependency are more prone to poor sleep quality due to bedtime procrastination and heightened FoMO. Since BSIT students rely on their devices for both academic and personal use, they are an ideal group for examining how evening smartphone use affects sleep quality. Camarista et al. (2025) also highlight a “population gap” in existing studies, as most research focuses on general college students rather than BSIT learners. Addressing this gap strengthens the relevance of our study.

The school’s locality also plays a big part, as it is mainly accessible, making it more efficient for gathering participants as respondents who will more likely cooperate with students within the same campus.

2.4 Research Instrument

In this quantitative study, the researchers will utilize one survey with two instruments to collect data within the two variables the study includes: evening smartphone usage and sleep quality. For the evening smartphone usage, a Likert scale with self-administered questionnaires will be used. The Likert scale will include questionnaires that assess the participants on how long they use their smartphones at night, how much evening smartphone usage delays their sleep schedule, and other questions that are in relation to their usage of smartphones before sleeping. To measure the sleep quality of each participant, the researchers will be utilizing the full, original version of the Pittsburgh Sleep Quality Index (PSQI) by Buysse et al. (1989) of the University of Pittsburgh, alongside the institution’s granted permission through an email

confirmation for educational use. The PSQI is commonly used for both clinical and research settings to assess different aspects of sleep. This self-report questionnaire allows researchers to acquire an understanding of sleep patterns, disturbances, and sleep disorders. Using the complete and unmodified PSQI ensures the accuracy, reliability, and comparability of the sleep quality data gathered in this study (Buysse et al., 1989).

The data will be collected online through Google Forms, a web-based application used to create and distribute surveys and forms. By gathering the data online, it will be more convenient for the researchers to gather responses, as all of the answers are automatically recorded and listed, which will be more cost-effective than doing a physical survey that would require printed copies of the survey questions and time-efficient since the researchers would not be required to gather participants in a face-to-face setting. This strategy will help the researchers to facilitate the data collection and analyze the results in an effective manner.

2.5 Population and Sample of the Study

The population of this study will consist of all Bachelor of Science in Information Technology (BSIT) students enrolled at STI College Malolos during the Academic Year 2025-2026. These students are chosen because they are more likely to engage in prolonged smartphone use due to the nature of their course, which involves extensive use of technology and online platforms for academic and entertainment purposes. The total population size is $N = 501$ students.

To ensure representativeness across year levels while keeping the required number of respondents manageable, the researchers will use a stratified purposive-voluntary sampling with proportional allocation. The population will be

divided into four strata according to their year level (1st year, 2nd year, 3rd year, and 4th year). From each stratum, respondents will be selected so that the sample will reflect the same proportion as the population. Due to practical constraints, the survey will be distributed via Google Forms, and participation will be voluntary. As such, respondents will be those who opted to participate, while the proportional allocation ensured representation from each year level.

Using Slovin's formula and considering practical constraints, the researchers will target a total sample size of $n = 100$ respondents (equivalent to a margin of error of ~9% for $N = 501$. This total target balances the credibility of the gathered data and the feasibility of data collection within the available time and resources. The sample will be allocated to year-level strata proportionally.

Formula:

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

| Year level | Population (N) | Proportion (%) | Sample Size (n) |
|------------|----------------|----------------|-----------------|
| 1st Year | 135 | 26.95% | 27 |
| 2nd Year | 141 | 28.14% | 28 |
| 3rd Year | 130 | 25.95% | 26 |
| 4th Year | 95 | 18.96% | 19 |
| Total | 501 | 100% | 100 |

Figure 1: Distribution of the BSIT Population Across Year Levels, which presents the total number of students in each year level and serves as the basis for applying stratified proportional sampling in this study.

2.6 Data Gathering Procedures

The following procedures outline how data will be collected for this study. These steps ensure that data gathering will be systematic, ethical, and aligned with the defined population and sampling method.

2.6.1 Preparation of Instruments

- The researchers will use two instruments in gathering data: a self-administered questionnaire regarding their evening smartphone usage via a Likert scale, and the Pittsburgh Sleep Quality Index (PSQI) for assessing sleep quality.
- Both instruments will be combined into a single Google Forms that includes an introduction and explanation of the study, an informed consent section, screening questions, questions regarding evening smartphone usage, and the PSQI.

2.6.2 Identification of the Population and Sampling Method

- The population consists of all **501 BSIT students** at STI College Malolos (A.Y. 2025-2026).
- The researchers will use **stratified purposive-voluntary sampling** with proportional allocation to ensure representation from each year level.
- The target sample size is **100 students**, equivalent to about a **9% margin of error**, which balances accuracy with feasibility.

- Each year level will receive a proportional number of slots based on its share of the total BSIT population.

2.6.3 Recruitment of Respondents

- The researchers will **request approval** from the subject teacher to conduct the research and distribute it to the BSIT students of STI College Malolos.
- A numbered list of enrolled BSIT students per year level will be obtained for proportional sampling. No identifying student details or master list of names will be acquired to ensure participation remains **entirely voluntary**.
- The researchers will conduct **room-to-room visits** to encourage students to participate in the study.
- Students from each stratum will be invited to scan a **QR code** that opens the Google Form to answer the survey.
- Participation will be voluntary, and students who choose to respond will be considered part of the sample for their assigned stratum.

2.6.4 Administration of the instruments

- The Google Form will be accessible for **7-10 days**.
- Each respondent must first **read and agree to the informed consent** before answering the questionnaire.
- Only **one response** per respondent will be allowed.

2.6.5 Data Handling and Processing

- All responses will be automatically recorded in **Google Forms**.

- After collecting the answers from the form, the researchers will carefully organize the data in an orderly way for easier understanding.
- The researchers will perform a statistical study on the organized data to generate accurate results and answer the research questions. Specifically, the **Pearson Product-Moment Correlation Coefficient (Pearson r)** will be used to determine the strength and direction of the relationship between evening smartphone use and sleep quality.

2.7 Ethical Considerations

The researchers will ensure that the study follows proper ethical standards. Students will receive professional and respectful treatment. There will be no coercion on any student to participate in the study; participation will be entirely voluntary. Every student will be asked for their informed consent before any data is gathered. They will be informed about the purpose of the study and the methods that will be employed. At any moment, the students will have the option to decline or withdraw. All responses made by the students who are taking part in the study will be kept confidential and anonymous; all data are going to be stored securely and used only for academic purposes in compliance with the Data Privacy Act of 2012. Academic integrity will be upheld by accurately reporting all data and properly citing all sources.

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