NIGHTTIME DISRUPTIONS: EXPLORING THE LINK BETWEEN SMARTPHONE ADDICTION AND SLEEP QUALITY AMONG IT STUDENTS AT DAVAO DEL NORTE STATE COLLEGE

A Research Paper
Presented to the Faculty of the Institute of Computing
Davao del Norte State College
New Visayas, Panabo City

In Partial Fulfillment of the Requirement
for the Course IT324 – Social and Professional Issues 1

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May 2025

ACKNOWLEDGMENT

We wish to express our heartfelt gratitude and appreciation to the following persons. Without them, this work would have not been possible.

To our research adviser, Sir Rodrigo B. Sumuob Jr., for the belief in successful completion of the research work and moral support. We are grateful for his inputs that have informed this work in great detail.

To Dr. Mark Van M. Buladaco, our dean, for approving and supporting our research, which motivated us to pursue this study with confidence and commitment.

To Sir Reban Cliff A. Fajardo, our program chairperson, for granting the needed support to execute this study.

To the IT Students of Davao del Norte State College, our heartfelt appreciation goes to you for being our respondents. Your support helped us to make valuable findings that were presented in our study.

To our families, who have been great sources of support, financially, emotionally, and most of all, for being patient with us in managing this work. This has been made possible through their belief in us which has been our source of strength.

Above all, we are grateful to our Almighty God for his Divine Providence that was with us in the conduct of our study. All the glory and honor are given to Him.

The Researchers

ABSTRACT

The intention of this study was to find out if there is a relationship between smartphone addiction and sleep quality in IT students at Davao del Norte State College. The non-experimental quantitative design using the descriptive correlational method was used and 100 IT students were chosen as respondents through quota sampling technique. They measured smartphone addiction by asking questions through online and actual surveys about how well IT students do academically, their interaction competency, behavioral plans, and sleep quality factors related to bedtime, falling asleep, staying asleep, returning to sleep and waking up. It was shown that most IT students have a high level of smartphone addiction and that they also get a good night's sleep. No clear connection was found between smartphone addiction and sleep quality. Still, among the indicators, how well a student interacts had a major effect on bedtime.

Keywords: *smartphone addiction, sleep quality, interaction competency, correlational design, IT students, Davao del Norte State College*

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DEDICATION

This study is wholeheartedly dedicated to our families, for providing us with unconditional love and steady encouragement along the way. Your trust in us has supported us the most.

To our classmates from BSIT 3A, for giving us strength and happiness during all the moments we spent together in this journey

And above all, to the Almighty Father, who has guided, graced, and blessed us with strength all these years.

The Researchers

Chapter 1

INTRODUCTION

Rationale

Excessive smartphone use has become a significant factor in sleep disruptions among IT students at Davao del Norte State College. Research on senior high school students in Digos City, Philippines, found that the more severe the smartphone addiction, the greater the impact on sleep quality (Tacda, 2025). The results are consistent with global academic research showing that university students who are addicted to smartphones have trouble sleeping (Rathakrishnan et al., 2021). According to several studies, the main cause of poor sleep quality is not screen light but rather prolonged phone use that disrupts sleep (Sanjeev et al., 2020).

The evaluation of sleep quality stands important because research shows that poor sleep quality leads to poorer health along with academic decline (Zhu et al., 2024). Research established an association between the poor academic outcomes of university students who developed smartphone dependency (Boumosleh & Jaalouk, 2017). Inadequate sleep patterns increase stress and worry among students creating a further threat to their health quality. Research to create academic performance-enhancing treatments requires a complete understanding of sleep's relationship with academics (Alotaibi et al., 2020).

An excessive amount of smartphone usage directly leads to poor sleep duration among users. College students develop poor sleep quality because they overuse their smartphones. Users of smartphones prior to sleep time will experience worse quality

sleep and prolong their time of getting out of bed (Qi et al., 2023). Additionally, they experience longer periods to fall asleep. The results show that smartphone addiction creates immediate sleep-related issues (Alshobaili & AlYousefi, 2019). Sleep problems linked to smartphone addiction become clearer through this research which demonstrates that students need to develop awareness programs as well as proper intervention methods (Bamidele et al., 2024).

The unique challenges which IT students at Davao del Norte State College experience with their smartphones and sleep quality have not received substantial research attention from global studies. IT students at Davao del Norte State College experience disrupted sleep patterns because they spend excessive time coding and debugging their programs alongside deadline pressures. The research conducted locally proves significant as it determines minimal associations between academic pressure and technology dependency with sleep quality. The research explores particular components that will help IT students who require smartphone management yet strive to sustain academic results and achieve adequate sleeping hours.

Research Objectives

The main purpose of this study is to determine the relationship between Smartphone Addiction and Sleep Quality among IT students at Davao del Norte State College.

Specifically, this study aims to answer the following:

1. To determine the level of smartphone addiction among IT students at Davao del Norte State College in terms of:

1.1 academic performance;

1.2 interaction competency;

1.3 self-efficacy; and

1.4 behavioral intention.

2. To determine the level of sleep quality among IT students at Davao del Norte State College in terms of:

    2.1 going to bed;

    2.2 falling asleep;

    2.3 maintaining sleep;

    2.4 reinitiating sleep; and

    2.5 returning to wakefulness.

3. To determine the significant influence of smartphone addiction on sleep quality among IT students at Davao del Norte State College.

Hypothesis

H_0: There is no significant relationship between smartphone addiction and sleep quality among IT students at Davao del Norte State College.

Review of the Related Literature

The following segment reviews a complete body of literature regarding smartphone addiction and sleep quality. The research examines four important indicators: academic performance, interaction competency, smartphone self-efficacy, and behavioral intention to use smartphones. The analysis investigates how smartphone addiction affects different

aspects of sleep quality including going to bed, falling asleep, maintaining sleep, reinitiating sleep, and returning to wakefulness. Previous research results provide necessary groundwork for studying smartphone addiction among BSIT students at Davao del Norte State College (DNSC) and their sleep quality.

Smartphone Addiction

Smartphone addiction has become increasingly prevalent among college students, and this widespread behavior creates major problems with their academic results. Research across 44 studies with data from 147,000 college students located in 16 different countries demonstrated that smartphone addiction exists as an inverse relationship towards academic performance. This study found that students who exhibit higher smartphone addiction behavior achieve less in their learning along with having worse academic grades (Sunday et al., 2021). The excessive usage of smartphones affects students' ability to focus and memorize information which decreases their educational performance.

This has grown substantially among college students because their academic performance suffers from excessive smartphone usage. Research published in Computers in Human Behavior through meta-analysis proves smartphone addiction decreases learning success and academic results because students lose their ability to focus while using their phones while studying (Sunday et al., 2021). Furthermore, a study in the Global Journal of Health Science reported that higher levels of smartphone addiction are associated with lower academic performance among university students (Boumosleh, 2017). The research shows widespread smartphone usage negatively

impacts student concentration thus causing both academic procrastination and decreased educational performance.

Students who develop smartphone addiction face both mental health problems and challenges in restful sleep behavior. The Frontiers in Public Health journal documented that medical students experience sleep difficulties in addition to anxiety and depression and stress and poor sleep quality due to their excessive smartphone utilization (Nikolić, 2023). According to Sleep Medicine Reviews digital media usage which includes smartphones results in both reduced sleeping durations and inferior quality of sleep among adolescent students (Brautsch, 2022). Students experience daytime fatigue accompanied by cognitive impairment while their mental health declines because of sleep disturbances which obstructs their educational and social advancement.

Academic Performance. A recent study has shown that technology plays an important role in the aspects of contemporary life and exposes students to a great amount and variety of global information. In the academic aspect, smartphones have become the devices for college students to send messages, submit assignments, and search for data. However, the excessive use of smartphones or smartphone addiction may impact academic performance, as students tend to use their smartphones for entertainment purposes rather than for academic purposes (Rathakrishnan et al., 2021).

The excessive use of smartphones by college students creates negative academic effects as documented through recent research. Academic research demonstrates that smartphone addiction tends to make individuals more likely to procrastinate leading to poor academic achievement. Students who make extensive smartphone use during their study time achieve lower grades according to academic measurements (Zhang, 2024).

Research indicates that smartphones serve as important educational devices but extensive non-study smartphone use negatively impacts student learning outcomes.

Interaction Competency. Smartphones harm interaction competency because they reduce face-to-face communication abilities and create social withdrawal patterns. Different smartphone uses behaviors caused problematic behaviors through their distinction between social interactions and content consumption (Duke & Montag, 2017). The study established that the excessive consumption of smartphone content through videos and internet browsing produces bigger issues when compared to social smartphone use such as messaging. Smartphones allow connectivity through their services but addictive passive content use tends to reduce genuine social interaction and produces poor nonverbal communication abilities as well as social distancing effects. The research reveals a pressing need to control smartphone utilization so people can keep their skills strong in face-to-face communications as well as digital encounters.

Smartphone addiction disrupts a person's capability to communicate with others while simultaneously generating several societal and mental health issues. People who use smartphones to cope with emotions experience increased social isolation which worsens their level of social withdrawal while reducing real-life experiences with others. Young students who struggle with smartphone addiction tend to develop communication problems because they choose texting instead of human interaction which makes them struggle to express feelings clearly during direct conversations (Wacks & Weinstein, 2021). Understanding the importance of smartphone use awareness for maintaining and developing basic social abilities and interpersonal relationship quality stands evident from these data findings.

Self-efficacy. The addictive use of smartphones serves as a major element which affects student self-confidence levels at educational institutions. Higher levels of smartphone addiction create lower self-efficacy in university students (Tehrim, 2024). This study applied the Smartphone Addiction Scale and General Self-Efficacy Scale through testing 300 university participants within the age range of 18 to 32. The research indicates that rising smartphone usage leads to lower self-efficacy among students based on their negative correlation. Science shows that extended smartphone use among users causes both a decrease in self-esteem and an increase in anxiety. The study shows students need interventions for smartphone balance as these programs improve both student wellness and self-efficiency levels.

University students who use smartphones excessively develop diminished self-efficacy which affects their ability to handle academic tasks. Mobile device overuse during study activities drives students to put off their work and develop serious academic stress which slowly damages their belief in achieving academic goals. Reduced self-efficacy becomes the reason students struggle in their academic classes while their smartphone reliance continues to grow because of its role as a coping tool. The successful treatment of smartphone addiction stands as an essential need for various interventions which will promote better self-efficacy alongside academic achievements.

Behavioral Intention. Research demonstrates smartphone addiction directly influences what users plan to do regarding smartphone usage management applications. Problematic smartphone users had stronger intentions to employ management applications compared to their non-problematic counterparts (Choi et al., 2021). Awareness about excessive smartphone use leads people to become more apt at

adopting tools that control their smartphone usage. This research confirmed both perceived usefulness and perceived ease of use establish positive influences on user adoption intentions because these elements correspond to the key elements of the Technology Acceptance Model. Research findings support the conclusion that user-friendly smartphone management systems attract addiction-struggling individuals who are more likely to adopt such systems.

Research studies show that the strength of smartphone addiction leads users to adopt smartphone usage management applications differently. Smartphone addiction leads users to select smartphone usage management apps more frequently than people who do not have such dependencies. People with awareness about their excess smartphone usage along with the need for intervention tend to develop this inclination. Users adopt management tools for smartphones primarily because they find these tools beneficial and simple to operate according to the principles of the Technology Acceptance Model. Security concerns matter less to problematic users while facilitating conditions earn significant weight in their adoption process when compared to users without problems. The research demonstrates that developing user-friendly software along with secure smartphone management applications stands vital for efficiently helping smartphone addiction patients (Choi, 2021).

Sleep Quality

Sleep quality plays a crucial role in determining academic performance levels among college students. The study Appearing in Sleep Medicine, has shown that students who maintained stable sleep patterns and slept longer periods scored better

grades than students who lacked sleep consistency along with shorter total sleep time (Okano et al., 2019). The amount of sleep matters alongside its regularity when it comes to academic achievement support.

This directly affects student performance together with cognitive abilities. Insufficient sleep together with poor sleep quality has been found to disrupt memory consolidation while simultaneously decreasing concentration and learning performance. The investigation at Advances in Medical Education and Practice revealed how medical students experience better academic results when their sleep quality improves significantly (Jalali, 2020).

The poor quality of students' sleep produces negative effects on their psychological and emotional states. Sleep shortages create a direct link that leads students toward higher stress levels and intensified anxiety followed by depression symptoms. The Humanities and Social Sciences Communications study demonstrates that insufficient rest affects both procedural and declarative learning abilities while reducing alertness and diminishing the ability to remember essential information needed for academic achievements (Mehta, 2022). Students who practice good sleep hygiene measures that include regular sleeping patterns together with pre-bedtime screen limitation and comfortable bedtime arrangements will experience better sleep quality and general health benefits.

Going to bed. Sleep quality is defined as the satisfaction of the sleep experience, integrating the aspects of sleep initiation, sleep maintenance, sleep quantity, and refreshment upon the awakening of an individual According to the National Sleep Foundation, good sleep quality for adults means a person falls asleep in 30 min or less,

sleeps soundly through the night with no awakening, and drifts back to sleep within 20 min if you have awakened. Sleep quality is also affected when the individual overuses a smartphone at bedtime (Rathakrishnan et al., 2021).

Smartphone overuse before sleep creates major sleep disturbances by extending the time it takes to go to bed and decreasing the total duration of sleep. Smartphones generate blue light that interferes with how bodies produce melatonin for sleep regulation thus creating difficulty falling asleep at night. Smartphone exposure to interesting content produces higher cognitive stimulation which makes it difficult for users to achieve relaxation before sleep. The repeated disturbances from smartphones eventually develop into prolonged sleep restriction that damages both mental performance and mental state as well as physical health. To promote better sleep quality individuals should employ nighttime screen restrictions together with blue light filters and establish daily bedtime schedules as prevention strategies against these effects.

Falling Asleep. Pittsburgh Sleep Quality Index (PSQI) was created as a measure to evaluate sleep latency (falling asleep) together with sleep maintenance and reinitiating sleep (Buysse et al., 1989). Research discovered that sleep quality poor individuals face multiple sleep difficulties such as delayed onset time and numerous nighttime awakenings and poor sleep maintenance. PSQI serves as a dependable instrument for assessing sleep disturbances together with their impact on sleep health (Buysse et al.,1989).

The Pittsburgh Sleep Quality Index (PSQI) functions as a self-rating tool which evaluates both sleep quality and disturbances during one month's duration through 19 items grid format. The questionnaire contains 19 items that lead to seven subscales including subjective sleep quality and two additional components which measure sleep

latency and sleep duration together with habitual sleep efficiency followed by sleep disturbances and sleeping medication use with daytime dysfunction. The combination of seven component scores leads to a global score that shows worse sleep quality with higher rating values. The PSQI continues to be a preferred instrument for clinical research applications because investigators use it to evaluate sleep characteristics in 34,000 peer-reviewed articles. Its detailed evaluation provides a useful instrument for diagnosing sleep issues and helping people make decisions about sleep wellness improvements.

Maintaining Sleep. Maintaining proper sleep hygiene—such as adhering to a consistent sleep schedule, creating a restful environment, and engaging in relaxing pre-sleep activities—can significantly improve sleep quality (Libman, 2016). The research demonstrates that instructional programs which teach proper-resting strategies help students sleep better which improves both their academic and health outcomes. People need to practice sleep hygiene methods daily for achieving better sleep quality. Healthier sleep emerges when people implement sleep optimization techniques that boost their daily outcomes as well as their wellness.

Sleep hygiene education programs result in substantial improvements of sleep quality for college students. Research conducted at the Journal of Clinical Sleep Medicine proved that online sleep education programs delivered improvements in sleep habits together with decreased scores of depression. Available educational materials demonstrate their effectiveness in creating better sleep routines which benefits student academic outcomes and maintains total wellness (Hershner, 2018).

Reinitiating Sleep. Sleep reinitiation abilities determine how well individuals maintain their sleep quality (Lewandowski, 2011). The inability to start sleep again

produces broken sleep patterns that damage your mental alertness levels and regulates both mood and cognitive functioning throughout daytime. The investigation revealed that teens who dealt with chronic pain obtained impaired rest quality through elevated nighttime wakefulness and diminished sleep effectiveness compared to healthy teens. Based on these research findings the initial process of falling asleep requires enhancement because it influences overall sleep health directly.

The capability to fall asleep again following nighttime disturbances will directly impact how well you sleep. The struggle to regain sleep after disturbances produces discontinuous sleep patterns affecting the brain functions of attention recovery and decision-making performance and memory retention ability. Research data shows that people in older populations experience increased cognitive impairment through either sleeping too short amounts or too long amounts. Research shows that people who sleep fewer than four hours or more than ten hours experience more rapid cognitive function reduction than people who sleep seven hours during nighttime (Zimmerman, 2024). Sleep duration must be more than sufficient to achieve optimal cognitive health because the quality and continuity of sleep also play an essential role.

Returning to Wakefulness. The measure known as Wakefulness After Sleep Onset (WASO) reveals that the duration of awakenings which start right before sleep defines sleep quality (Suni, 2022). An increased occurrence of Wakefulness After Sleep Onset (WASO) produces disrupted sleep patterns which negatively impact cognitive abilities while affecting mood control and awake alertness in daytime. Improving sleep quality requires specific attention to the factors which increase Wakefulness After Sleep Onset. The treatment of WASO requires individuals to maintain routine sleep schedules

and create optimal rest environments while actively controlling any medical or psychological sleep-affecting conditions. People who reduce their periods of wakefulness during sleep obtain better restful sleep which enhances their health status and overall wellness.

Late wakefulness displays (WASO) cause significant destruction to sleep structure and generate both disrupted and unfulfilling sleep patterns. Scientific studies have shown that sleep interruptions lead to deadly cardiovascular problems in addition to depression and weakened immune responses. Control of WASO requires individuals to both establish regular sleep patterns and prepare comfortable sleeping conditions along with treating medical and psychological factors that interrupt continuous sleep. The execution of these techniques leads to more efficient rest while delivering benefits toward health improvement.

Theoretical Framework

The theory used in this research is Cognitive Load Theory (CLT). According to this theory, the brain possesses restricted information processing potential through which researchers define cognitive load as intrinsic, extraneous and germane dimensions. The material complexity falls under intrinsic load while the presentation format creates extraneous load and the process of creating new schemas belongs to germane load (Sweller, 1998). The findings of this research show how high nighttime smartphone usage leads to increased cognitive load which creates difficulties in sleep transition. Reading content and watching videos together with social-media activities strain the mind and affect how people both start and maintain their sleep patterns. The research analyzes

how smartphone usage at night causes cognitive load which disturbs college students' sleep patterns. Knowledge about this relationship helps develop night-time cognitive intervention strategies through activities promoting relaxation along with smartphone usage regulations.

Supporting this anchor theory, the Arousal Theory of Sleep Disturbance increased physiological arousal together with cognitive arousal levels that disturb sleep processes through smartphone notifications that raise arousal levels thus resulting in delayed sleep onset and reduced sleep quality (Joshi, 2023). In addition, sleep disturbances grow more severe according to Self-Regulation Theory because deficits in self-control cause people to use their smartphones excessively at night which disrupts their regular sleep routines (Carver & Scheier, 1981). Furthermore, the Technology Acceptance Model (TAM) shows that people tend to use their smartphones more habitually because they find them easy to use and useful irrespective of the sleep-related drawbacks (Mejía-Mancilla & Mejía-Trejo, 2024). These support theories create an entire framework to investigate how smartphone use at night harms sleep quality by providing behavioral and technological solutions alongside cognitive intervention approaches.

In addition, according to the Compensatory Health Beliefs (CHBs) Model, people develop explanations to validate dangerous behaviors that harm their health during their pre-bedtime smartphone usage period (Knäuper, 2004). Everybody holds beliefs that define harmful actions as counterbalanced through proper activities during different times. Students who use smartphones late at night may justify their actions through plans to extend weekend sleep sessions or increase their exercise which they believe will offset sleep reduction. Narcotic beliefs that help offset unhealthy behaviors create a recurrent

pattern between unsound sleep habits and quality deterioration. Research published in Digital Health demonstrated that sleep-related cognitive and behavioral habits and bedtime procrastination serve as intermediaries which explain the relationship between problematic smartphone use and sleep quality problems in emerging adults (An, 2024). Sleep improvements among students would benefit from interventions that challenge their misconceptions about sleep.

In the study, "Nighttime Disruptions: Exploring the Link Between Smartphone Addiction and Sleep Quality Among College Students," various theoretical frameworks are employed to analyze how nighttime smartphone use affects sleep quality. The **Cognitive Load Theory (CLT)** demonstrates that students experience high cognitive difficulty in sleeping after performing activities such as reading or social media use during the evening. Extreme mental engagement during nighttime can prevent students from both starting to sleep and stay asleep which decreases their overall restfulness. According to the **Arousal Theory of Sleep Disturbance** higher levels of physical alertness and brain activity due to smartphone alerts and interactive features delay the timing of falling asleep and create fragments in sleep duration. **Self-Regulation Theory** suggests that control function deficits cause people to overuse smartphones during nighttime which disrupts their standard sleeping schedules and deteriorates their rest quality. Students develop smartphone habits because they value the devices' ease of use and their usefulness according to the **Technology Acceptance Model (TAM)** even though they recognize how such devices affect their sleep quality negatively. The **Compensatory Health Beliefs Model** demonstrates how people rationalize their unhealthy smartphone behaviors at night by creating mental callbacks that they will

balance these actions with wellness activities such as weekend sleep plans or more exercise. These unrestricted beliefs about health compensation result in persistent bad sleep behaviors and worsening sleep outcomes. The research combines three theoretical frameworks which leads to an organized understanding of smartphone use during nighttime for college student sleep disturbances to create targeted treatment approaches.

Conceptual Framework

Figure 1 shows the conceptual framework of the study. As shown in the figure, Smartphone Addiction is the independent variable, which comprises **Academic Performance,** quantifying the effect of smartphone use on studying performance and productivity of coursework, **Interaction Competency**, quantifying the extent to which smartphones influence the potential of students to maintain social relationships and communicate effectively, Self-Efficacy, reflecting students' confidence when using smartphones to execute academic and personal tasks, and Behavioral Intention, quantifying the level at which students will continue using their phones for various tasks.

The dependent variable is Sleep Quality, which comprises **Going to bed**, the processes and activities involved in bed preparation form part of sleep readiness, **Falling Asleep**, the period needed to change consciousness from being awake to being asleep, **Maintaining Sleep**, the ability to sustain uninterrupted sleep, **Reinitiating Sleep**, the capacity to fall back asleep after nighttime awakenings, and **Returning to Wakefulness**, the frequency and duration of wakefulness episodes during the night.

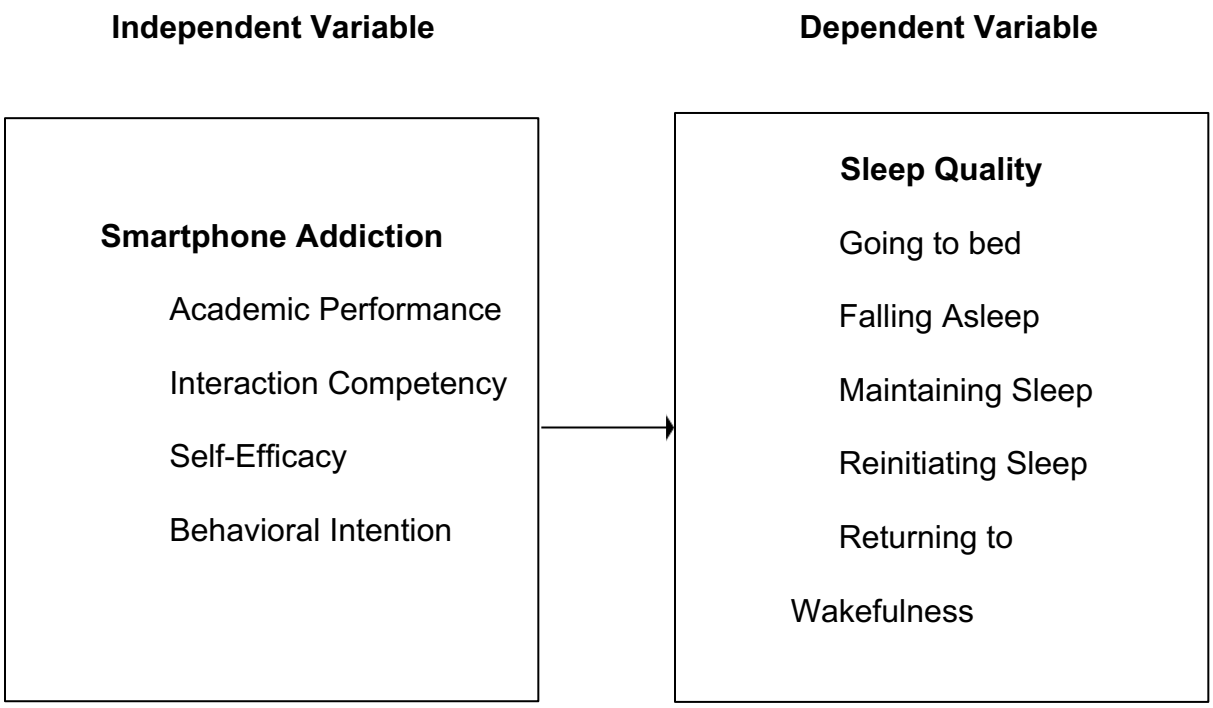

Figure 1. Conceptual Framework of the Study

Significance of the Study

Smartphone addiction and its impact on sleep quality are recognized as pressing issues affecting students worldwide. The study contributes new cultural knowledge about digital wellness while providing common approaches for better screen behavior and better sleep quality to international research.

The Philippines experiences growing concerns about digital addiction effects and well-being of students due to smartphone dependence in educational settings and social communication. The findings from this study will support policy makers in formulating national programs that benefit education and mental wellness programs.

At Davao del Norte State College (DNSC), this research investigates IT students to study smartphone impact on their cognitive wellness and sleep patterns. Researchers established findings that both advise students about better digital practices while enabling educators to design effective wellness measures on campuses.

Furthermore, future researchers can build on this study by exploring balanced ways individuals can benefit from technology while reducing smartphone addiction. Scientists investigate different approaches to monitor screen time usage and introduce digital rest periods as well as relaxation practices. The investigation should evaluate brain functions together with memory and focus capabilities as well as stress and anxiety connected to prolonged smartphone usage. The acquired understanding direct users toward better device usage with mindfulness.

Definition of Terms

To have a common structure of references, the subsequent terms were operationally defined:

Smartphone Addiction. The repetitive smartphone usage that interferes with regular routines, e.g., study and sleep. *In this study,* it pertains to academic performance, interaction competency, self-efficacy, and behavioral intention.

Sleep Quality. Overall sleep quality. *In this study,* it pertains to going to bed, falling asleep, maintaining sleep, reinitiating sleep, and returning to wakefulness.

Chapter 2

METHOD

Presented in this chapter are the following parts of the thesis: research design, research locale, population and sample, research instrument, data collection, statistical tools, and ethical consideration. It outlines the steps taken to analyze the connection between smartphone addiction and sleep quality in IT students. It also explains in detail how the study was conducted using ethical methods and accurate tools.

Research Design

This research used a non-experimental quantitative research utilizing the descriptive correlational approach to explore the relationship between smartphone addiction and sleep quality among IT students of Davao del Norte State College. Creswell and Creswell (2018) stated that this design is anchored on a conceptual framework that establishes theoretical relationships between smartphone use and sleep patterns, thus guiding analysis of how different levels of smartphone addiction could impact students' sleep quality. The descriptive part systematically presents the respondents' smartphone addiction level and sleep quality, thus capturing an entire picture of existing trends. At the same time, the correlational part explores the direction and strength of the relationship between these two variables without manipulating either. As a result, this design will prevent researchers from controlling the different variables. Therefore, they will link through the use of statistical methods or correlation statistics.

Additionally, this means that this particular research technique is indeed appropriate for the current study to look at the connection of smartphone addiction and

sleep quality. Also, the purpose may be to clarify why something takes place. Since it is a non-experimental study, it explores connections between naturally existing events without claiming cause-and-effect relationships. It examines how two or more variables are connected. It allows testing on how various variables are related and uses that to predict outcomes. It may also evaluate such relationships during everyday life.

Research Locale

The research is conducted at Davao del Norte State College, Panabo City as the location for the study. Particularly, the researchers choose Institute of Computing (IC) because it has a significant population of Information Technology (IT) students, who are considered suitable respondents for the study. The research site selection bases itself on the growing need to observe student digital behavior patterns with special focus on IT majors. IT students at DNSC comprise the perfect subject group because they heavily engage with digital devices for academic and personal needs which concerns smartphone addiction and sleep quality relationships. Figure 2 shows the map of Panabo City highlighting Davao del Norte State College. Panabo is a component city in the province of Davao del Norte and is part of the Davao Region (Region XI). The place serves as an emerging educational and technological center in the region so researchers consider it suitable for this research.

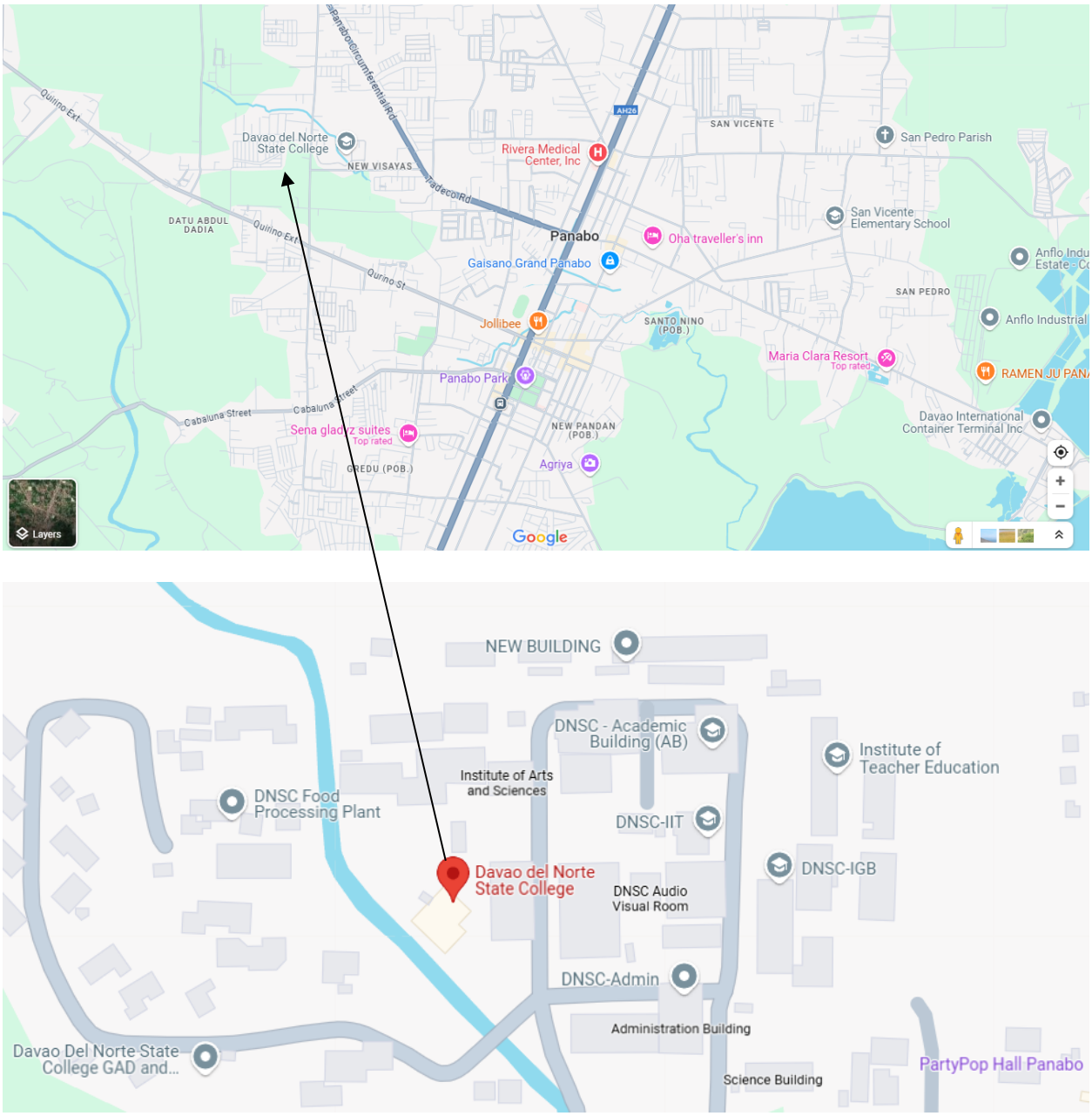

Figure 2. Map of Panabo City and Davao del Norte State College

Population and Sample

The research utilized Quota Sampling as a sampling method. A total of 100 respondents who are IT students from Davao del Norte State College (DNSC) Academic Year 2024–2025 formed the research sample. Quota Sampling operated as the chosen method by researchers since it ensured equitably distributed quotas between specific subgroups from the population. The demographic distribution of 948 IT students at DNSC was represented by selecting participants according to specific year levels based on proportional quotas.

The research included a total of 948 IT students who were separated into four year-level categories including first-year students with (207) participants and (293) students studying in their second year and (316) participants in their third-year studies and (132) fourth-year students. The researchers established quotas following population proportions of students within each academic year to reach their goal of 100 student participants. The selected participants followed the quota distribution pattern of (25) first-year students, (25) second-year students, (25) third-year students, and (25) fourth-year students. The researchers distributed the quotas to maintain participation from students across their academic years with precise representation so they could compare cohabitants' periods with mobile device usage and sleep consistency. Two essential selection requirements were implemented for the study: participants needed (1) minimum daily smartphone use of two hours along with (2) offering consent as a condition for study participation.

The research criteria specifically targeted students that demonstrated a high likelihood of smartphone dependency so they could offer substantial information about

how addiction affects sleep quality. The research employed Quota Sampling to achieve representative participation from diverse academic years besides satisfying their desired subject pool of 100 individuals. Quota Sampling is particularly suitable when researchers aim to ensure specific subgroup representation without the need for random sampling (Iliyasu & Etikan 2021).

Research Instrument

The research utilized the combination of two research approaches. The first study titled "The Impact of Smartphone Addiction on Academic Performance of Higher Education Students" serves as the main study of (Mukhdoomi & Khan, 2020). The research explored smartphone addiction effects on educational performance through questionnaires based on a 5-point Likert scale that measured the variables of academic productivity and communication competency alongside self-efficacy and smartphone use behavioral intention. A wide range of data from higher education students was collected by online methods to analyze smartphone dependence effects on student learning results. The instrument showed high internal consistency, with a Cronbach's Alpha coefficient of 0.89, indicating excellent reliability.

The second study analyzed for this research is "The Relationship Between Reported Sleep Quality and Sleep Hygiene in Italian and American Adolescents" by (LeBourgeois et al., 2005). The research evaluated sleep habits and sleep quality in adolescents through their structured questionnaire which used a 6-point Likert survey scale. The evaluation method focused on sleep characteristics starting from sleep onset to maintaining rest and going to bed and restarting sleep once awake as well as leaving

sleep. This research demonstrated how sleep hygiene affects the reported sleep quality of individuals. The adapted instrument also demonstrated good internal consistency, with a Cronbach's Alpha coefficient of 0.87.

The research data concerning smartphone addiction effects on sleep for Davao del Norte State College IT students was gathered through a survey questionnaire as the main instrument. The study contained two main sections. Part one is the smartphone addiction for variable measurement through five Likert response options from Mukhdoomi and Khan (2020).

Range of Means	Descriptive Level	Interpretation
4.20 – 5.00	Very High	This means that the behavior or characteristic described in the item is always exhibited.
3.40 – 4.19	High	This means that the behavior or characteristic described in the item is often exhibited.
2.60 – 3.39	Moderate	This means that the behavior or characteristic described in the item is sometimes exhibited.
1.80 – 2.59	Low	This means that the behavior or characteristic described in the item is seldom exhibited.
1.00 – 1.79	Very Low	This means that the behavior or characteristic described in the item is never exhibited.

On the other hand, part two is the sleep quality patterned from LeBourgeois et al. (2005) which has five indicators including going to bed, falling asleep, maintaining sleep, reinitiating sleep, and returning to wakefulness with a modification accurate to the respondents of the research using the 6-point likert scale.

Range of Means	Descriptive Level	Interpretation
4.20 – 5.00	Very High	This means that the measure described in sleep quality item is always manifested.

3.40 – 4.19	High	This means that the measure described in sleep quality item is oftentimes manifested.
2.60 – 3.39	Moderate	This means that the measure described in sleep quality item is sometimes manifested.
1.80 – 2.59	Low	This means that the measure described in sleep quality item is seldom manifested.
1.00 – 1.79	Very Low	This means that the measure described in sleep quality item is never manifested at all.

Data Collection

The data were personally gathered by the researcher through the following steps: To begin with, the researcher composed a formal letter requesting permission to conduct the study. The letter was read, signed, and endorsed by the Dean of the Institute of Computing (IC), Chairperson of the Information Technology (IT) Program, and the professor concerned. To make the study ethical, a signed informed consent form was appended to all the surveys. The form stated the purpose of the study, that the participation was voluntary, and that the answers would be kept confidential.

The researchers collected responses from one hundred Information Technology (IT) students, twenty-five students from each study year. After they had obtained permission, the researchers carried out an orientation session where they explained the objectives, procedures, and ethics of the study, and requested their permission.

Fifty students completed the survey online with Google Forms following an email and student chat group distribution of the link with definitions and instructions on the terms. The remaining fifty students completed a paper copy that was distributed in the free periods of Davao del Norte State College; the researcher provided them with instructions on how to complete it and answered any questions. The returned surveys

were verified for completeness, paper answers were entered into a digital spreadsheet, and the combined data were ready to be analyzed.

Statistical Tools

The collected data were handled using appropriate statistical techniques to enhance their suitability for analysis. The following tools were used:

Mean. This was used to determine the level of smartphone addiction and sleep quality among IT students at Davao del Norte State College.

Pearson's r. This was used to determine the significant relationship between smartphone addiction and sleep quality among IT students at Davao del Norte State College.

Ethical Consideration

To ensure that the respondents rights and welfare are upheld, a number of ethical issues will be taken into account when conducting this study procedure assessments and standards conditions mostly in gathering data such as, but not restricted to:

Voluntary Participation using Online Platforms. An online consent form will be used to obtain the consent of the chosen responders among the IT students prior to collecting data from them through utilizing online platforms (google form), and actual survey. The researchers will thoroughly explain the study's goal and their involvement. Respondents are allowed to exit from the study at any time. There will be no pressure or coercion on any subject to take part in the study.

Privacy and Confidentiality. Every piece of information collected by the researchers will be kept confidential and safely secured to avoid unwanted access. The data and findings from this study will not be disclosed in a form that might identify specific respondents; they will only be used for the completion of study.

Benefits. The results of this study could enhance our understanding of smartphone addiction and its impact on sleep quality, both academically and practically.

Plagiarism. The study will ensure that no one else's work is misrepresented as original. This study will undergo a plagiarism detector like https://plagiarismdetector.net/ to avoid such a thing.

Forgery. There is no indication that the study persistently distorted the results to fit a model or theoretical expectation. The research doesn't have evidence of over claiming or embroidery.

Fabrication. Fake data won't be used in the study. All conclusions will be based on the participants' real answers, and any mistakes found will be openly fixed.

Deceit. No false information will be given to the respondents.

Authorship. The researchers of the study are students from Davao del Norte State College and taking up the course Bachelor of Science in Information Technology. The researchers will go through a supervision and review process overseen by their academic adviser.

Chapter 3

RESULTS

Shown in this section is the smartphone addiction and sleep quality of IT students at Davao del Norte State College. The data gathered are organized, discussed and interpreted based on the objectives of the study. The discussions begin with the level of smartphone addiction and followed by the level of sleep quality of IT students. In addition, this section also discusses the correlation between smartphone addiction and sleep quality.

The standard deviation in two descriptive tables, Table 1 and 2, ranged from 0.30 to 1.57 that is within the typical standard deviation for 5-point Likert Scale, indicating that most of the student responses were close to the average. This suggests that the scores in the accomplished questionnaires are close to the mean that indicates homogeneity of responses among IT students at Davao del Norte State College.

Smartphone Addiction Among IT Students

Presented in Table 1 shows how IT students at Davao del Norte State College view and use their smartphones, particularly in terms of academics, social interaction, confidence in using the device, and their overall intention to keep using it. The overall average score was 4.43, which is considered very high, meaning that smartphone-related behaviors are strongly present in their daily routines.

Looking first at academic performance, the mean was 4.21, also falling into the very high category. This means students generally feel that smartphones help them study better, stay productive, and manage coursework more efficiently. Among the statements,

the most strongly agreed upon was “Finding a smartphone useful in my studies” with a mean of 4.50, showing that most students see smartphones as essential learning tools.

Table 1.

Level of Smartphone Addiction Among IT Students at Davao Del Norte State College

Indicators	SD	Mean	Descriptive Level
Academic Performance			
Using a smartphone helps me to study more efficiently.	**0.92**	**4.16**	**High**
Using a smartphone improves my performance in studying.	**0.82**	**4.03**	**High**
Using a smartphone increases my course work productivity.	**0.86**	**4.12**	**High**
Using a smartphone enhances my study effectiveness.	**0.76**	**4.16**	**High**
Finding a smartphone useful in my studies.	**0.67**	**4.50**	**Very High**
Category Mean	**0.60**	**4.21**	**Very High**
Interaction Competency			
Maintaining social relationships with others using a smartphone.	**0.83**	**4.47**	**Very High**
Getting feedback quickly using a smartphone.	**0.64**	**4.54**	**Very High**
Interacting with others using multiple tools using a smartphone.	**0.59**	**4.64**	**Very High**
Interacting with others no matter where they are using a smartphone.	**0.52**	**4.64**	**Very High**
Having a longer conversation with others easily using a smartphone.	**0.59**	**4.65**	**Very High**

Category Mean	**0.39**	**4.61**	**Very High**
Smartphone Self-Efficacy			
Taking tests with a smartphone, I currently do.	**0.82**	**4.27**	**Very High**
Registering for courses with a smartphone, I currently do.	**0.68**	**4.41**	**Very High**
Navigating course websites and reading course material with a smartphone, I currently do.	**0.63**	**4.53**	**Very High**
Working on assignments and presentations with a smartphone, I currently do.	**0.66**	**4.46**	**Very High**
Searching for information with a smartphone, I currently do.	**0.50**	**4.70**	**Very High**
Category Mean	**0.43**	**4.49**	**Very High**
Behavioral Intention to Use Smartphone			
Emailing friends about classes is something I want to do with a smartphone.	**0.91**	**4.00**	**High**
Making phone calls to friends about classes is something I want to do with a smartphone.	**0.76**	**4.26**	**Very High**
Sending text messages to friends about classes is something I want to do with a smartphone.	**0.65**	**4.56**	**Very High**
Sending messages via Facebook to friends about classes is something I want to do with a smartphone.	**0.66**	**4.61**	**Very High**
Contacting an instructor is something I am able to do with a smartphone.	**0.57**	**4.67**	**Very High**
Category Mean	**0.45**	**4.44**	**Very High**

Overall	**0.30**	**4.43**	**Very High**

When it comes to interaction competency, students scored even higher—with an average of 4.61. This tells us that they use their phones a lot to keep in touch with others, whether through messaging, video calls, or social apps. Nearly all items in this section received scores above 4.60, showing just how central smartphones are to their social lives.

The smartphone self-efficacy indicator, which measures how confident students feel about using smartphones for school-related tasks, also received a very high rating at 4.49. Notably, the item “Searching for information with a smartphone” got the highest score of all at 4.70, highlighting just how much students depend on their phones to look up and understand academic content.

Lastly, the behavioral intention to use smartphones had a mean of 4.44, which is again very high. Students strongly expressed their intention to continue using smartphones for class-related communication—especially for messaging friends and reaching out to instructors. Only one item in this section, “Emailing friends about classes”, received a slightly lower rating (4.00), but it still fell within the high category. IT students at DNSC are not just frequent smartphone users—they’re confident, intentional, and socially engaged when using these devices. The results clearly reflect how embedded smartphone use is in both their academic and personal lives.

Sleep Quality Among IT Students

Displayed in Table 2 are the levels of sleep quality among IT students at Davao del Norte State College across five dimensions: going to bed, falling asleep, maintaining

sleep, reinitiating sleep, and returning to wakefulness. The overall mean sleep quality score was M = 3.83, SD = 0.79, which corresponds to a high descriptive level. This indicates that students generally experience good sleep quality and most of the sleep-related behaviors measured were oftentimes manifested.

Table 2.

Level of Sleep Quality Among IT Students at Davao Del Norte State College

Indicators	SD	Mean	Descriptive Level
Going to Bed			
Staying up when it's time to go to bed, I want to do other things (for example: watch television, play video games, talk on the phone).	**0.81**	**4.53**	**Very High**
Making myself go to bed at bedtime is something I have trouble with.	**1.11**	**4.17**	**High**
Being ready to go to bed at bedtime is how I usually feel.	**1.01**	**4.09**	**High**
Enjoying bedtime is part of my nightly routine.	**0.80**	**4.42**	**Very Hig**
Trying to “put off” or delay going to bed is something I often do.	**1.04**	**4.13**	**High**
Category Mean	**0.63**	**4.28**	**Very High**
Falling Asleep			
Having trouble settling down when it's time to go to sleep (lights-out).	**1.39**	**3.67**	**High**
Feeling sleepy when it's time to go to sleep (lights-out).	**1.05**	**4.26**	**Very High**

Lying down but then getting up and coming out of the bedroom when it's time to go to sleep (lights-out).	**1.14**	**3.93**	**High**
Having trouble going to sleep.	**1.20**	**3.99**	**High**
Needing help getting to sleep (for example: listening to music, watching television, taking medication, or having someone else in the bed).	**1.27**	**3.88**	**High**
Falling asleep quickly.	**1.26**	**3.72**	**High**
Category Mean	**0.82**	**3.91**	**High**
Maintaining Sleep			
Tossing and turning in my bed during the night.	**1.30**	**3.77**	**High**
Being very restless during the night.	**1.24**	**3.65**	**High**
Moaning, groaning, or talking in my sleep during the night.	**1.49**	**3.16**	**Moderate**
Kicking or jerking my legs during the night.	**1.55**	**3.22**	**Moderate**
Waking up more than once during the night.	**1.29**	**3.53**	**High**
Sleeping soundly through the night.	**1.33**	**3.82**	**High**
Category Mean	**1.08**	**3.53**	**High**
Reinitiating Sleep			
Waking up during the night, I have trouble going back to sleep.	**1.19**	**3.91**	**High**
Waking up during the night, I have trouble getting comfortable.	**1.15**	**3.82**	**High**
Waking up during the night, I wake up another family member.	**1.56**	**2.95**	**Moderate**

Waking up during the night, I need help to go back to sleep (for example: I need to watch television, read, or sleep with another person).	**1.40**	**3.50**	**High**
Waking up during the night, I feel scared.	**1.57**	**2.84**	**Moderate**
Waking up during the night, I roll over and go right back to sleep.	**1.26**	**3.78**	**High**
Category Mean	**1.08**	**3.47**	**High**
Returning to Wakefulness			
Waking up in the morning, I feel ready to get up for the day.	**1.16**	**3.78**	**High**
Waking up in the morning, I feel rested and alert.	**1.16**	**3.68**	**High**
Waking up in the morning, I just can't get going.	**1.03**	**4.08**	**High**
I need help waking up in the morning (for example: from an alarm clock or another person).	**1.43**	**3.93**	**High**
I have trouble **getting** out of bed in the morning.	**1.19**	**4.19**	**High**
Category Mean	**0.82**	**3.94**	**High**
Overall	**0.79**	**3.83**	**High**

Among the indicators, going to bed had the highest category mean (M = 4.28, SD = 0.63), classified as very high. This suggests that bedtime-related routines—such as readiness for bed and enjoyment of bedtime—were consistently practiced by the respondents. However, responses also reflected tendencies to delay bedtime due to engaging in other activities, such as watching television or using a smartphone.

The falling asleep dimension followed with a category mean of M = 3.91, SD = 0.82, indicating a high level. Students reported generally falling asleep with ease, although some still required aids like music or screen use to initiate sleep. For maintaining sleep, the mean score was M = 3.53, SD = 1.08, also at a high level. Despite this, specific items such as "moaning or talking in sleep" (M = 3.16) and "kicking or jerking legs" (M = 3.22) were only moderately manifested, indicating some variation in uninterrupted sleep quality.

In the domain of reinitiating sleep, the mean was M = 3.47, SD = 1.08, which also falls under the high descriptive level. Nonetheless, two behaviors—waking up scared (M = 2.84) and waking up another person (M = 2.95)—showed only moderate manifestation, pointing to occasional disruptions. Lastly, returning to wakefulness received a category mean of M = 3.94, SD = 0.82, classified as high. This suggests that most students were able to wake up feeling rested and ready, although some still needed external help to wake up (e.g., alarm clocks or other people). Overall, the data reflect that while IT students report high levels of sleep quality across various dimensions, there are specific areas—particularly in maintaining and reinitiating sleep—where occasional disturbances still occur.

Significance on the Relationship between Smartphone Addiction and Sleep Quality of IT students

Shown in Table 3 are the results of the Pearson correlation analysis examining the relationship between the dimensions of smartphone addiction and sleep quality among IT

students at Davao del Norte State College. The correlation coefficients (r-values) and their corresponding p-values are reported to determine statistical significance.

Table 3.

Significant Relationship Between Smartphone Addiction and Sleep Quality among IT Students at Davao Del Norte State College

Smart Phone Addiction	**Sleep Quality**					
	Going to Sleep	Falling Asleep	Maintaining Sleep	Reinitiating Sleep	Returning to Wakefulness	**Overall**
Academic Performance	.067	.156	.174	.185	.087	**.160**
	(.505)	(.121)	(.084)	(.066)	(.388)	**(.111)**
Interaction Competency	.220*	.019	-.045	-.117	.116	**.019**
	(.028)	(.853)	(.658)	(.245)	(.249)	**(.853)**
Smartphone Self-Efficacy	.069	-.023	-.032	-.036	.117	**.012**
	(.493)	(.823)	(.750)	(.719)	(.245)	**(.907)**
Behavioral Intention to Use Smartphone	-.111	.007	-.034	-.028	-.061	**-.046**
	(.271)	().947	(.737)	(.783)	(.548)	**(.653)**
Overall	**.089**	**.078**	**.048**	**.031**	**.101**	**.073**
	(.379)	**(.438)**	**(.635)**	**(.763)**	**(.318)**	**(.468)**

Across all dimensions, the results indicate weak and statistically non-significant correlations between the overall measure of smartphone addiction and the various components of sleep quality, including going to sleep (r = .089, p = .379), falling asleep (r = .078, p = .438), maintaining sleep (r = .048, p = .635), reinitiating sleep (r = .031, p = .763), returning to wakefulness (r = .101, p = .318), and the overall sleep quality score (r = .073, p = .468).

Notably, interaction competency showed a small but statistically significant positive correlation with the component “going to sleep” (r = .220, p = .028), suggesting that

students with higher social interaction competency via smartphones tend to have more consistent bedtime routines. However, no other indicators, including academic performance, smartphone self-efficacy, or behavioral intention to use smartphones, demonstrated significant relationships with sleep quality.

The null hypothesis stated that “There is no significant relationship between smartphone addiction and sleep quality among IT students at Davao del Norte State College.” Based on the correlation results, where all overall relationships between smartphone addiction and sleep quality yielded non-significant p-values ($p > .05$), the null hypothesis is *accepted.*

These findings imply that smartphone addiction, as a general construct, is not significantly associated with sleep quality among the surveyed IT students. Despite high levels of smartphone usage, students in the study still maintained acceptable sleep patterns, suggesting the possibility of effective coping mechanisms or adaptive routines. The only notable exception is the role of social interaction via smartphones, which appears to modestly support better sleep initiation. This isolated correlation does not, however, undermine the overall conclusion that smartphone addiction does not significantly impair sleep quality within this sample population.

Chapter 4

DISCUSSION

Presented in this chapter are the discussions on the data gathered and collected on the smartphone addiction and sleep quality of IT students at Davao del Norte State College. The discussion starts on the level of indicators of smartphone addiction and are followed by sleep quality of IT students. Additionally, the results of correlations between measures of smartphone addiction and sleep quality of IT students are also thoroughly discussed.

Smartphone Addiction Among IT Students

The findings show an overall mean score of 4.43, which falls within the "*Very High*" range, indicating that smartphone addiction is consistently manifested among the respondents. This high level is primarily driven by elevated scores across all four indicators: interaction competency (M = 4.61), smartphone self-efficacy (M = 4.49), behavioral intention to use smartphones (M = 4.44), and academic performance (M = 4.21).

The highest scores were recorded in interaction competency, where all items—such as the ability to maintain social relationships, obtain feedback, and engage in extended conversations using smartphones—received "very high" ratings. This reflects how deeply integrated smartphones are in the social lives of students. Consistent with these findings, Duke and Montag (2017) explained that smartphones have become primary tools for maintaining social connectivity, particularly through messaging and

media sharing. However, they also cautioned that such high dependence can interfere with face-to-face interactions and foster social withdrawal.

Similarly, the high scores in smartphone self-efficacy reveal that students are confident in using smartphones for academic tasks, such as registering for courses, accessing materials, and completing assignments. This suggests that smartphones serve as valuable educational tools when used effectively. According to Tehrim (2024), high self-efficacy in smartphone use correlates with frequent use in educational contexts, although it may also contribute to multitasking behaviors that can reduce cognitive efficiency.

In terms of behavioral intention, students expressed strong intentions to continue using smartphones for academic communication, such as messaging peers and instructors. This aligns with Choi et al. (2021), who found that students with higher smartphone usage patterns often show stronger intentions to adopt smartphone-related tools, particularly when they perceive them as useful and easy to use.

Lastly, academic performance received the lowest mean score among the four indicators but still fell within the “very high” descriptive level (M = 4.21). This suggests that while students believe smartphones help in improving academic productivity, this belief is slightly less pronounced than in other dimensions. This result reflects the complex role of smartphones in education. Although smartphones can aid academic tasks, excessive non-academic use may reduce focus and lead to procrastination, as noted by Sunday et al. (2021). The high levels of smartphone addiction in this cohort suggest that smartphones are deeply embedded in both the academic and social routines of IT

students. While this integration provides convenience and efficiency, it may also pose challenges related to overuse, time management, and potential behavioral dependency.

Sleep Quality Among IT Students

The overall mean score of 3.83 indicates a high level of sleep quality, suggesting that most students reported that the sleep-related behaviors measured in the study were oftentimes manifested. Among the five indicators, going to bed received the highest mean score (M = 4.28, SD = 0.63), categorized as *very high*. This indicates that most respondents demonstrated consistent bedtime routines despite potential distractions. This finding supports the assertion of Rathakrishnan et al. (2021), who emphasized that bedtime behaviors, including the ability to commit to a scheduled sleep time, play a key role in determining perceived sleep quality—even among individuals with high smartphone usage.

The second highest indicator was returning to wakefulness (M = 3.94, SD = 0.82), also reflecting a high level. This suggests that despite waking up occasionally, students generally felt alert and ready to begin their day, which aligns with the Sleep Foundation's (Suni, 2022) perspective that effective sleep recovery, such as reduced wakefulness after sleep onset (WASO), contributes significantly to overall restfulness and daytime functioning.

Falling asleep was rated with a mean of 3.91, also high, indicating that while some students may experience initial difficulties at lights-out, they generally manage to fall asleep without significant issues. The Pittsburgh Sleep Quality Index (PSQI) supports this

interpretation, as it highlights the importance of sleep latency in evaluating quality sleep, particularly in young adults (Buysse et al., 1989).

The dimensions maintaining sleep (M = 3.53) and reinitiating sleep (M = 3.47) were rated lowest, though still within the high range. These results suggest that while students may wake up during the night, they generally manage to resume sleep effectively. However, sub-indicators such as “moaning or talking in sleep” and “feeling scared upon waking” received relatively lower scores, indicating moderate disturbances for a subset of respondents. According to Lewandowski et al. (2011), challenges in reinitiating and maintaining sleep are often tied to environmental stressors and nighttime cognitive arousal, which are prevalent among students managing academic responsibilities and screen exposure.

Interestingly, the data reflect that student, despite high smartphone use (as noted in Table 1), are still able to maintain a satisfactory level of sleep. This may be attributed to adaptive behaviors or compensatory routines that mitigate potential sleep disruption. Meneo et al. (2024) argue that diverse pre-sleep routines, such as relaxing activities or mindful screen use, can buffer the negative impact of digital media exposure on sleep onset and quality. While IT students demonstrate good sleep patterns overall, the slightly lower scores in sleep maintenance and reinitiation suggest specific areas where targeted interventions—such as improving sleep hygiene or reducing nighttime stimulation—may further enhance sleep quality.

Significance on the Relationship between Smartphone Addiction and Sleep Quality of IT students

The findings reveal that, overall, there is no significant correlation between general smartphone addiction and sleep quality ($r = .073$, $p = .468$). This suggests that although IT students exhibit high levels of smartphone use, it does not statistically impair their sleep quality. Across the different indicators of smartphone addiction—academic performance, interaction competency, smartphone self-efficacy, and behavioral intention to use smartphones—none demonstrated a significant relationship with the five sleep quality dimensions: going to sleep, falling asleep, maintaining sleep, reinitiating sleep, and returning to wakefulness. The only exception was interaction competency, which showed a significant positive correlation with the "going to sleep" indicator ($r = .220$, $p = .028$). This result implies that students who are more socially engaged through their smartphones tend to have more consistent bedtime routines.

This finding aligns with the assertion by Samaha and Hawi (2016) that the effects of smartphone use are nuanced, and not all forms of use (e.g., socially engaging interactions) are necessarily detrimental to sleep quality. In fact, some studies suggest that moderate social smartphone usage can promote emotional support and reduce bedtime anxiety, which may help in initiating sleep (Kim et al., 2015). This supports the interpretation that interaction via smartphones, especially when tied to meaningful communication, might help students wind down and follow regular bedtime patterns.

In contrast, the lack of significant relationships between the remaining indicators and sleep quality reinforces the findings of Vuorre et al. (2022) and Meneo et al. (2024), who reported that media engagement before bedtime does not universally disrupt sleep.

They emphasized that the type of media activity, personal intentions, and individual coping mechanisms are critical factors that influence sleep outcomes more than the amount of screen time alone. This means that while students may be using smartphones frequently, their ability to regulate usage or choose non-arousing content (e.g., messaging or music) could mitigate negative effects on sleep.

The weak and non-significant correlations between smartphone self-efficacy and sleep quality further support this interpretation. High smartphone self-efficacy—defined as confidence in using smartphone features effectively—may enable students to manage their usage in ways that do not interfere with sleep (Tehrim, 2024). Similarly, behavioral intention to use smartphones was not significantly related to any sleep indicators, indicating that mere intention or preference for smartphone use does not automatically translate into poor sleep outcomes, especially if usage is moderated or balanced by healthy routines (Zhu et al., 2024).

Ultimately, the results from Table 3 support the acceptance of the null hypothesis, which states that there is no significant relationship between smartphone addiction and sleep quality among IT students at Davao del Norte State College. Although some students exhibit high levels of smartphone use, particularly in areas like interaction competency and self-efficacy, these behaviors do not necessarily result in diminished sleep quality. Instead, the findings suggest that how smartphones are used may be more important than how much they are used.

Conclusion

This section presents the conclusions of the study which are based on the research objectives and significant results after thorough review. The findings indicate that IT students at Davao del Norte State College exhibit a very high level of smartphone addiction, particularly in the areas of interaction competency and smartphone self-efficacy. Despite this, their overall sleep quality remains high, with students showing consistency in bedtime routines and morning alertness. Although some experienced disturbances in maintaining or reinitiating sleep, most were still able to achieve sufficient rest. These results suggest that high smartphone usage, while prevalent, does not inherently impair sleep quality, supporting studies by Vuorre et al. (2022) and Orzech et al. (2016), which found that media use before bed does not automatically lead to poor sleep, particularly when users manage their habits mindfully.

The correlation results revealed no significant relationship between overall smartphone addiction and sleep quality ($r = .073$, $p = .468$), thereby supporting the null hypothesis. However, a notable exception was observed in the significant positive correlation between interaction competency and the “going to sleep” component ($r = .220$, $p = .028$), suggesting that socially engaged smartphone users may follow more consistent bedtime routines. This aligns with the work of Samaha and Hawi (2016), who noted that social smartphone use, when purposeful, may have a calming or routine-reinforcing effect. Other indicators such as academic performance, self-efficacy, and behavioral intention did not show significant associations with any sleep dimensions, indicating that the nature and context of smartphone use, rather than frequency alone, may influence sleep outcomes.

These results partially reaffirm the study's theoretical foundations. While Cognitive Load Theory and the Arousal Theory of Sleep Disturbance suggest that high cognitive and physiological engagement from smartphone use disrupts sleep (Sweller, 1998; Joshi, 2023), the data do not fully support this across the sample. Instead, findings align more closely with the Self-Regulation Theory and Compensatory Health Beliefs Model, which emphasize personal control and rationalization in behavioral outcomes (Carver & Scheier, 1981; Knäuper et al., 2004). Furthermore, the Technology Acceptance Model is validated by the high behavioral intention scores, suggesting that students value the utility of smartphones without necessarily experiencing negative health consequences (Mejía-Mancilla & Mejía-Trejo, 2024). Overall, the study underscores the complexity of smartphone use and highlights the importance of digital literacy and mindful usage in maintaining well-being.

Recommendations

In light of the specific findings and conclusions of the study, the following recommendations are proposed:

Educational institutions, particularly the Institute of Computing at Davao del Norte State College, should implement wellness programs that encourage responsible and mindful smartphone usage. Campaigns may include workshops on digital well-being, bedtime screen curfews, and the use of app-based trackers or screen time limiters. These initiatives should highlight the benefits of reducing phone use before bedtime and introduce healthier alternatives for winding down, such as journaling, stretching, or guided meditation.

Since students demonstrated relatively good sleep patterns despite high device usage, peer-led sleep hygiene awareness programs could further reinforce positive habits. These can be integrated into classroom discussions, student council initiatives, or dormitory seminars. Topics may include the importance of consistent sleep schedules, the impact of blue light, and relaxation techniques. Encouraging students to share their coping strategies for balancing technology and sleep could promote a collaborative and relatable learning environment.

Given the observed high smartphone self-efficacy and behavioral intention among students, incorporating modules on self-regulation, media multitasking, and digital mindfulness into general education or IT courses can empower students to optimize their tech use. This includes teaching students how to evaluate the impact of their screen habits and apply self-monitoring tools to prevent overuse that could eventually harm their health or academic performance.

As the study found no significant overall relationship between smartphone addiction and sleep quality, it is recommended that future researchers explore additional variables that may moderate or mediate this relationship. These could include stress levels, academic workload, types of smartphone activities, and emotional resilience. Comparative studies involving different academic programs, age groups, or lifestyle backgrounds would provide a broader understanding of how technology affects student wellness.

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