ABSTRACT

Aims: Smartphones are technical devices that have a huge impact on people's daily lives, causing them to change their habits and behaviors. Several studies reveal many factors that influence students sleep disorders, and one of them is smartphone addiction. This study was conducted to examine the relationship between smartphone addiction and sleep disorders
Study design: The study employed a descriptive-correlation type of research.
Place and Duration of Study: This study was conducted at UM Digos College (Philippines) under the Senior High School Department and was implemented in the Academic Year 2023-2024.
Methodology: This study utilized a standardized survey questionnaire that was contextualized by the researchers. It was participated in by 200 students in grades 11 and 12 at University of Mindanao Digos College and utilized stratified random sampling.
Results: The results indicated that the more the student is addicted to their smartphone, the more they will have sleeping disorders. The finding also proved that students with poor sleep quality are addicted to smartphones. Smartphone addiction was found to be associated with sleep disturbances.
Conclusion: On this basis, the problem of smartphone addiction and sleep disturbance should be tackled in order to improve the sleeping patterns of students and their overall health.

Keywords: smartphone addiction, sleeping disorder, Grade 11 and Grade 12, descriptive-correlation

1. INTRODUCTION

Smartphones are technical devices that have a huge impact on people's daily lives, causing them to change their habits and behaviors. The utility and capacities of these gadgets are expanding, and this trend is expected to continue in the coming years. However, the harmful usage of smartphones has escalated (Osorio-Molina et al., 2021). Considering smartphones are so prevalent in our society, excessive use and even addiction have become major global issues.
Overuse of your cellphone or smartphone can result in a number of different physical problems that may cause permanent damage or be difficult to treat, including sleep disturbance (Parasuraman et al., 2017). Smartphone addiction increases sleep disorders and fatigue, with bright light affecting sleep quality and increasing the time it takes to fall asleep. Smartphones have dramatically increased in the past years this trend is accompanied by increased concerns regarding potentially adverse effects of excessive smartphone use, particularly with respect to physical and mental health (Horvath et al.,2020).

A UK population survey found that smartphone addiction negatively impacts sleep quality, with 61.6% of participants reporting poor sleep. Internet use, particularly excessive smartphone use, can reduce rapid eye movement (REM) sleep, slow-wave sleep, and sleep efficiency. Melatonin secretion may also delay sleep (Laneet al., 2021). Smartphones provide social support and facilitate communication, but excessive use can cause negative psychological effects. People become anxious when without a smartphone, and daily smartphone use can affect sleep quality by making it difficult to put down before bed (Alotaibi et al., 2022). In the Philippines is considered one of the most active groups of people who use social media. Despite the slow internet connection, Filipinos have managed to break the barrier and be considered active users.

This study is anchored to Use and Gratifications Theory. According to Use and Gratifications Theory (Blumler& Katz, 1974) smartphone addiction is a maladaptive technique for pursuing pleasure. The Uses and Gratification theory examines how the media affects people. It discusses how people utilize media to meet their own wants and feel satisfied

when those needs are met. In other words, the idea emphasizes what individuals do with media rather than what media does to them. This theory has the ability to offer a theoretical framework for the addiction and satisfaction level since it is acknowledged as being capable of describing human behavioral elements associated to mediated communication.

There is a need for more specific investigations that specifically target senior high school students at UM Digos College. There are limited studies that have explored the relationship between smartphone addiction and sleeping disorders within this particular group, it highlights the need for further research to gain a more comprehensive understanding. Additionally, examining potential factors that may mediate or moderate this relationship could also help bridge the research gap.The aim of this study is to investigate the correlation between smartphone addiction and sleeping disorders among senior high school students at the UM Digos College. This study could provide learnings, information, and valuable contribution to future researchers and students.

The study aims to evaluate the extent and nature of smartphone addiction among senior high school students at the UM Digos College. Explore the possible correlation between smartphone addiction and sleeping disorders among senior high school students.

This study specifically seek to answer the following questions: (1) What is the level of smartphone addiction of the students? (2) What is the level of sleeping disorder of the students? (3)Is there a significant relationship between smartphone addiction and sleeping disorder?

2. MATERIAL AND METHODS

This section includes the research design, research participants, research instruments, and data gathering procedure. Statistical treatment is needed in this study to obtain valid and reliable answer to the problem.

2.1. Research Design

This study is non-experimental quantitative research employing descriptive-correlational research design. This design aims to determine if there is a relationship among the selected variables (Curtis et al., 2016; Diquito et al., 2024). The primary sources of information was obtained through the use of questionnaires. This study sought to collect data from the Senior High School Students of UM Digos College. This study used a Stratified Sampling Method in order to generate respondents to the instrument. The term “Stratified Sampling” refers to a method of sampling from a population that can be partitioned into subpopulations (Degorio et al., 2023). The research was gathered and collected in a quantitative manner using standardized questionnaires. This study used a quantitative methods with a 200 participants.

2.2. Research Participants

The respondents of this study are the Senior High School students of UMDigos College. This institution is located in Mindanao and part of the province of Davao del Sur, Philippines (Acuña et al., 2023, Caballes et al., 2024). The participants employed in this study with a total of 200 respondents within Grade 11 and Grade 12 students. There are 428 total number of Grade 11 and 12 students enrolled in first and second semester school year 2023-2024. 164 are from Humanities and Social Sciences (HUMSS) track, 138 are from Science, Technology, Engineering, and Mathematics (STEM) track, 69 are from Accountancy, Business, and Management (ABM) track, 11 are from General Academic Strand (GAS) track, 28 are from Information and Communication Technology (ICT) track, 11 are from Home Economics (HE) track, 7 are from Automotive Servicing (AS) track. Only 200 students within Grade 11 and Grade 12 students of UM Digos College Senior High School participated in this study. The listing of the respondents was obtained from the Senior High School Principal’s Office. The corresponding strands are divided as shown in Table 1.

Table 1: Characteristics of 200 SHS students included in the survey

Strand	f	%
HUMSS	164	38.50
STEM	138	32.50
ABM	69	16
GAS	**11**	2.50
ICT	28	6.50
HE	11	2.50
AS	7	1.50

2.2. Research Instruments

The instrument was used in the study of "The Relationship Between Smartphone Addiction And Sleeping Disorder In Senior High School Students At University Of Mindanao Digos College" is standardized questionnaire in the form of a checklist. The first questionnaire, Smartphone Addiction Scale (SAS) was adapted and modified from the research of Min Kwon et al. (2013) that allow researchers to test the level of student’s addiction in smartphone it consists of 33 questions and The second questionnaire, Sleep Quality Scale (SQS) was adapted and modified by Yi et al. (2006) that allow

researchers to test the level of student's sleep quality it consists of 28 questions and it was validated through pilot testing with 20 participants, and the result is cronbach alpha 0.932 for Smartphone Addiction and cronbach alpha 0.875 for Sleeping Disorder. The rating below shows how the respondents rate their Smartphone Addiction and Sleeping Disorder.

The Smartphone Addiction Scale (SAS) evaluates six domain of smartphone addiction: daily-life disturbance, positive anticipation, withdrawal, overused, cyber-spaced oriented, and tolerance. The SAS is a self-completed, 6-point Likert-type scale with 33 items. Each question has a response scale from 1 to 6 (1 = Strongly Disagree, 2= Disagree, 3= Weakly Disagree, 4= Weakly Agree, 5= Agree, and 6 = Strongly Agree). The scale below was used to interpret the data for smartphone addiction as shown in Table 2.

Table 2. Smartphone Addiction Scale

Numerical Scale	Range of Means	Verbal Description	Descriptive Meaning
6	5.39 - 6.00	Strongly Agree	If the measure described in the item is Strongly Agree by the students. This indicates that the student is strongly addicted.
5	4.20 – 5. 39	Agree	If the measure described in the item is Agreed by the students. This indicates that the student is addicted in using smartphone.
4	3.40 – 4.19	Weakly agree	If the measure described in the item is weakly agreed by the students. This indicates that the student is moderately addicted.
3	2.60 – 3.39	Weakly Disagree	If the measure described in the item is weakly disagreed by the students. This indicates that the student is somehow addicted.
2	1.80 – 2.59	Disagree	If the measure described in the item is disagreed by the students. This indicates that the student is somehow not addicted in using smartphone.
1	1.00 – 1.79	Strongly Disagree	If the measure described in the item is strongly disagreed by the students. This indicates that the student is not addicted in using smartphone.

The Sleep Quality Scale (SQS) evaluates six domain of sleep quality: daytime symptoms, restoration after sleep, problem initiating and maintaining sleep, having trouble waking up and contentment with sleep. Using a four-point, Likert type scale, the respondents indicated how frequently they show certain sleep behaviors: (1= Rarely, 2= Sometimes, 3= Often, and 4= Almost Always). The scale below was used to interpret the data for sleep quality as shown in Table 3.

Table 3. Sleep Quality Scale

Numerical Scale	Range of Means	Verbal Description	Descriptive Meaning
4	3.39 - 4.00	Almost Always	This indicates that the student sleeping time is so low.
3	2.20 – 3.38	Often	This indicates that the student is having difficulty to sleep.

2	1.80 – 2.19	Sometimes	This indicates that the student sleeps moderately.
1	1.00 - 1.79	Rarely	This indicates that the student is having enough time to sleep .

2.3. Data Gathering Procedure

The following procedures were done by the researchers in gathering the dat:

Asking Permission to Conduct the Survey. The researchers formally wrote a permission letter addressed to the Principal's Office of UM Digos College SHS Department to seek for approval of the said study.

Asking Permission to Access the Students Record Data. The researchers formally wrote a permission population letter addressed to the Principal's Office of UM Digos College SHS Department to seek for students record data.

Administration and Retrieval of the Research Instrument. After the approval, the validated questionnaires were distributed to the respondents.

Collation and Processing of Data. After the retrieval of the survey questionnaires, the researchers tally the data.

Interpretation and Analysis of Data. When the data gathered through the survey questionnaire were processed statistically, the said data were analyzed and interpreted to answer the problem in the study.

2.4. Statistical Treatment of Data

The following statistical tools were used in the interpretation and analysis of the data gathered.

Mean. This is utilized to describe the level of the respondent's smartphone addiction in terms of daily-life disturbance, positive anticipation, withdrawal, overused, cyber-spaced oriented, and tolerance, and the level of sleep disorder in terms of daytime symptoms, restoration after sleep, problem initiating and maintaining sleep, having trouble waking up and contentment with sleep.

Pearson r. This was used to determine the significant relationship between the ulitization of smartphone addiction and sleeping disorder of the students in UM Digos College.

3. RESULTS AND DISCUSSION

This section contains analysis and interpretation of data gathered from the survey conducted on the Grade 11 and Grade 12 Senior High School Students in UM Digos College from the school year 2023-2024. Thus, the discussion focuses on the following: (1) The level of the students smartphone addiction in terms of daily-life disturbance, positive anticipation, withdrawal, overused, cyberspaced oriented, and tolerance (2) The level of the students sleeping disorder in terms of problem- initiating, restoration, having trouble waking-up, contentment with sleep, maintaining sleep, and day-time symptoms, and (3) The significant relationship between smartphone addiction and sleeping disorder of the students.

Student's Smartphone Addiction

Table 4. shows that the indicators of the smartphone addiction of Grade 11 and Grade 12 SHS students of UM Digos College had an overall total mean of 3.77 (SD=0.772), which was perceived as weakly agree. This implies that the Grade 11 and Grade 12 SHS students are moderately addicted to smartphone.

According to Alharbi et al. (2022), Given its faster information availability, smartphones have become a necessary gadget. One touch can solve any issue, and many find it difficult to live without it. It may also change behavior. As for the state of communication today, smartphones are the most popular. With hundreds of built-in apps, it was designed to address common accessibility issues.Additionally, According to Oulasvirta et al. (2012) cited by Alharbi et al. (2022), People now have more control over where, when, and how they interact with others thanks to smartphones. A lot of people who own smartphones check them first thing in the morning and again right before bed. Furthermore, people are used to checking their phones hundreds of times a day.

Table 4: Level of Smartphone Addiction (n=200)

Indicators	Mean	SD
Daily-life disturbance	3.88	1.05
Positive Anticipation	4.01	0.89
Withdrawal	3.38	1.23
Overused	3.96	0.92

Cyber-spaced Oriented	3.37	0.98
Tolerance	4.04	1.12
Overall	3.77	0.77

Daily-life disturbance. An indicator of student addiction which was “daily-life disturbance” had a mean of 3.88 (SD=1.05) which was interpreted as weakly agree. This implies that Grade 11 and Grade 12 students are moderately addicted to smartphone. They are moderately addicted by means of preferring to utilize smartphone even it disrupts various aspects of daily functioning. According to Kushlev et al. (2019), there is evidence that using a smartphone while on the go impairs attention span and productivity. Regularly checking smartphones for notifications or multitasking can cause distraction, reduced productivity, and trouble concentrating on one thing at a time, which can ultimately have an impact on one's performance at work or in school.

Positive Anticipation. An indicator of student addiction which was “positive anticipation” had a mean of 4.01 (SD=0.895) which was interpreted as weakly agree. This implies that Grade 11 and Grade 12 students are moderately addicted to smartphone. They are moderately addicted by means of feeling pleasant or excited, feeling confident, being able to get rid of stress, and their life would be empty without a smartphone. According to Olasina& Kheswa (2021) there is a negative drawbacks to too much usage of smartphones.

Withdrawal. An indicator of student addiction which was “withdrawal” had a mean of 3.38 (SD=1.23) which was interpreted as weakly disagree. This implies that Grade 11 and Grade 12 students are somehow addicted to smartphone. They are somehow addicted by means of feeling impatient, fretful, anxious about not being able to receive important calls, and can’t stop using a smartphone. According to Zayed (2024), Withdrawal symptoms indicate how the body and brain respond when a person abruptly stops using their phone, which makes symptoms signs of phone addiction. Restlessness, irritation or impatience, difficulty concentrating, sleeping disorders, and urges for smartphone use are frequent signs of withdrawal. Due to smartphone dependence, using a smartphone all day can influence people’s sleep, since they have difficulty putting it down before going to bed and have poor sleep quality (Sohn et al., 2021).

Overused. An indicator of student addiction which was “overused” had a mean of 3.96 (SD=0.926) which was interpreted as weakly agree. This implies that Grade 11 and Grade 12 students are moderately addicted to smartphone. They are moderately addicted by means of using their smartphone uncontrollably, preferring to solve a problem using the smartphone instead of asking for help from others, and wanting to use their smartphone again immediately after using it. According to Grant et al. (2019), adverse consequences caused by overuse or dependence on smartphones can be easily seen nowadays. For example, those walking across streets and watching videos on a smartphone without checking traffic signals may be in danger of being hit by a car, while driving a car while fumbling with a smartphone may cause a car accident.

Cyber-spaced Oriented. An indicator of student addiction which was “cyber-spaced oriented” had a mean of 3.37 (SD=0.987) which was interpreted as weakly agree. This implies that Grade 11 and Grade 12 students are moderately addicted to smartphone. They are moderately addicted by means of the feeling that one’s relationships with friends acquired through smartphones are more intimate than relationships with real-life friends, and an uncontrolled sense of loss when one cannot use their smartphone. Busalimet al. (2019) has shown that there is a negative effect of using too much social media, such as Facebook, on student’s academic performance.

Tolerance. An indicator of student addiction which was “tolerance” had a mean of 4.04 (SD=1.12) which was interpreted as weakly agree. This implies that Grade 11 and Grade 12 students are moderately addicted to smartphone. They are moderately addicted by means of constantly trying to reduce how much time they spend on their smartphones, having the want to use them, and utilizing them during breaks. According to Omama et al. (2022), tolerance is the desire of an individuals to decrease his/her mobile phone usage that he/she fails to abide by. Hence it reflects a deep desire in the consumers and the bad habit of excessive usage of smartphones in their daily lives.

Students Sleeping Disorder

Table 5. shows that the indicators of the sleeping disorder of Grade 11 and Grade 12 SHS students of UM Digos College had an overall total mean of 2.46 (SD=0.462), which was perceived as often. This implies that the Grade 11 and Grade 12 SHS students are having difficulty to sleep.

According to Rathakrishnan et al. (2021), 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. When someone uses their smartphone excessively before bed, it also affects the quality of their sleep. Due to the blue light emitted by smartphones, which interferes with melatonin production and disturbs our bodies' normal cycles, using smartphones and tablets excessively in the evening makes it difficult to go asleep. As a result, those who use their smartphones right before bed will have lower-quality sleep. But for a variety of reasons, individuals stay up late these days, which lowers the quality of their sleep.

Table 5. Level of Sleep Disorder of the respondents (n=200).

Indicators	Mean	SD
Problem Initiating	2.44	0.76

Restoration	2.70	0.68
Having trouble waking up	2.30	0.68
Maintaining Sleep	2.44	0.68
Contentment with sleep	2.30	0.77
Daytime symptoms	2.60	0.74
Overall	2.46	0.46

Problem Initiating. An indicator of student sleep disorder which was “problem initiating” had a mean of 2.44 (SD=0.766) which was interpreted as often. This implies that Grade 11 and Grade 12 students are having difficulty to sleep. According to Suni&Singh (2023), the beginning of sleep can also be disrupted by environmental variables like noise, light exposure: particularly from screens, and uncomfortable sleeping arrangements. Screen time before bed suppresses melatonin, the hormone that controls the sleep-wake cycle, it has been shown that screen time in particular causes a delayed onset of sleep.

Restoration. An indicator of student sleep disorder which was “restoration” had a mean of 2.70 (SD=0.683) which was interpreted as often. This implies that Grade 11 and Grade 12 students are having difficulty to sleep. According to the restorative theory cited by Brinkman et al. (2024), during sleep, the body replenishes and repairs cellular components that are lost during the day and are essential for biological processes. This is supported by research showing that a number of bodily processes, including protein synthesis, muscle repair, tissue growth, and the production of numerous growth-promoting hormones, take place mostly while we sleep.

Having trouble waking up. An indicator of student sleep disorder which was “having trouble waking up” had a mean of 2.30 (SD=0.686) which was interpreted as often. This implies that Grade 11 and Grade 12 students are having difficulty to sleep. According to Hilditch &McHill (2019), Sleep inertia, the brief period of time when the body shifts from being asleep to being awake, is one reason why it can be difficult to wake up. Upon waking up, sleep inertia can cause a person to feel drowsy, confused, and even less able to think clearly. Also according to Hilditch&Mchill (2019) Sleep inertia may be influenced by changes in brain activity as a person is waking up. Sleep inertia can make a person feel groggy, disoriented, and even cognitively impaired immediately after waking.

Maintaining Sleep. An indicator of student sleep disorder which was “maintaining sleep” had a mean of 2.44 (SD=0.688) which was interpreted as often. This implies that Grade 11 and Grade 12 students are having difficulty to sleep. According to Suni&Rehman (2024),A sleep problem called insomnia is characterized by trouble falling asleep, staying asleep, or both, even when you have enough time and a comfortable bedroom. ongoing insomnia, which is characterized by trouble falling asleep or maintaining asleep, has been associated with daily cognitive problems, particularly poor memory function.

Contentment with sleep. An indicator of student sleep disorder which was “contentment with sleep” had a mean of 2.30 (SD=0.774) which was interpreted as often. This implies that Grade 11 and Grade 12 students are having difficulty to sleep. According to Nelson et al. (2022),Positive impacts of good sleep quality include feeling rested, having normal reflexes, and having pleasant connections. Moreover, According to Hasana (2023), The amount to which an individual feels content with their sleep experience is determined by their capacity to initiate and maintain sleep, obtain adequate sleep, and awaken feeling restored.

Daytime symptoms. An indicator of student sleep disorder which was “daytime symptoms” had a mean of 2.60 (SD=0.745) which was interpreted as often. This implies that Grade 11 and Grade 12 students are having difficulty to sleep. According to Suni& Rehman (2024), Insomnia results in symptoms of sleep loss during the day. People who suffer from insomnia frequently complain of being tired during the day, which can cause problems with cognition or focus. Sleepiness brought on by insomnia can impair productivity at job, at university, or in social situations and raise the possibility of accidents. Especially in adolescents, insomnia can have an adverse impact on behavioral health and be a contributing factor to episodes of aggression, hyperactivity, or irritability.

Significant Relationship Between Smartphone Addiction and Sleeping Disorder

Table 6 shows the relationships between Smartphone Addiction and Sleeping Disorder, various dimensions of these behaviors were correlated with different aspects of sleep quality. The dimensions of smartphone addiction included Daily-life Disturbance, Positive Anticipation, Withdrawal, Overused, Cyber-space Oriented, and Tolerance. The aspects of sleep evaluated were Problem Initiating, Restoration, Having Trouble Waking Up, Maintaining Sleep, Contentment with Sleep, Daytime Symptoms, and an overall sleep disturbance score. Significant correlations were observed across many dimensions. Daily-life Disturbance was significantly correlated with all aspects of sleep disturbance (r = .364* with Problem Initiating, r = .228** with Having Trouble Waking Up, r = .282** with Maintaining Sleep, r = .431** with Daytime Symptoms, and r = .389** overall). Positive Anticipation also showed significant correlations, particularly with Maintaining Sleep (r = .272**). Tolerance showed strong correlations with Restoration (r = .258**), Having Trouble Waking Up (r = .261**), Maintaining Sleep (r = .349**), Daytime Symptoms (r = .373**), and the overall score (r = .394**).

Table 6. Correlation matrix between sleep disorder and smartphone addiction.

Smartphone Addiction	Sleep Disorder						
	Problem Initiating	Restoration	Having Trouble Waking Up	Maintaining Sleep	Contentment With Sleep	Daytime Symptoms	Overall
Daily-Life Disturbance	0.364*	0.137	0.228**	0.282**	0.044	0.431**	0.389**
Positive Anticipation	0.225*	0.17*	0.195*	0.272**	0.093	0.163*	0.29**
Withdrawal	0.178*	0.109	0.14*	0.157*	0.016	0.155*	0.196*
Overused	0.208*	0.191*	0.185*	0.318*	-0.027	0.214*	0.279*
Cyber-Spaced Oriented	0.236*	0.138	0.164*	0.282**	0.088	0.176*	0.281**
Tolerance	0.226*	0.258**	0.261**	0.349**	0.061	0.373**	0.394**
OVERALL	**0.32****	**0.223***	**0.262****	**0.366**	**0.06**	**0.341**	**0.407****

We can also see in the table above that the results suggest a potential interplay between sleep disturbances and smartphone addiction dimensions ($r(198)=0.407$, $p<0.001$)., indicating that individuals experiencing more severe sleep problems might also exhibit higher levels of smartphone addiction related to daily life disturbances, anticipation of positive rewards, and increased tolerance.

This is supported by the study of Rathakrishnan et al. (2021), which one of the major reasons why individuals stay up late and have poor quality sleep is smartphone addiction. Our quality of sleep is correlated with the amount of time we spend in front of a screen. Students who use their smartphones right before bed will not get sufficient sleep. Several studies have found a correlation between smartphones and the quality of sleep. Long-term use of smart devices, like smartphones and smart mobile TVs, has been linked to problems with awakening and falling asleep, poorer health, and disturbance to daily living. Moreover, According to Leow et al. (2023), Overuse of smartphones could result in addiction. In other words, people who are addicted to smartphones disregard how much time they spend on them or are unable to control their use, which has adverse impacts on their everyday lives. An addiction to smartphones can lead to disruption during the day, along with poorer and lower-quality sleep. Negative sleep quality, stress, anxiety, sadness, irritability, and overall poor behavior are all positively connected with smartphone addiction. Furthermore, Sohn et al. (2021), pointed out that due to smartphone dependence, using a smartphone all day can influence people's sleep since they have difficulty putting it down before going to bed and have poor sleep quality.

4. CONCLUSION

The level of smartphone addiction in terms of Tolerance, Positive Anticipation, Overused, and Daily-life Disturbance was observed moderately by the students. Also, the level of sleep disorder of the students was described as often. This means, that the more the student is addicted to their smartphone, the more they will have sleeping disorders. So therefore, there is a significant relationship between Smartphone Addiction and Sleeping Disorder within Grade 11 and Grade 12 students in UMDC. These results suggest that smartphone addiction contributes to sleeping disorders among students, potentially due to increased screen time, late-night usage, and reduced opportunities for physical relaxation before bed. This correlation underscores the importance of addressing smartphone usage habits within the students to promote better sleep health

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