Relationships between Smartphones and Insomnia

By

Chananon Thepharak M.6/1 No.3

Tharitawan Sorsomboon M.6/1 No.7

Napatsakorn Chuenka M.6/1 No.15

Peerawat Akarachaipak M.6/1 No.16

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By Chananon Thepharak

Tharitawan Sorsomboon

Napatsakorn Chuenka

Peerawat Akarachaipak

Field of study : Computer, Science-Health

Project advisor : Nattaphol Mesawad

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Abstract

Smartphones are one of the most important things in human lives nowadays. People use them for browsing the internet, communicating with others, or taking photos. With these factors, people nowadays can barely live without using their phones because of how much we depend on them, especially in younger democratic. The addiction of phones in teenagers has been on a constant rise-more than ever. As a result, smartphones have the potential to cause long-term health problems.

In this research, our objective is to study the relationship between phone and insomnia, which is one of the most serious health problems. We want to know more about the relationship between them, and ensure that insomnia comes from smartphones or not.

Our research method is divided into two important parts, which are firstly the questionnaire surveys and secondly the application to confirm and make sure that the information is accurate and correct.

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Chapter 1

Introduction

1.1 Introduction and Motivation

Sleeping is one of the most important things that our body needs to do for survival, which means not using too much of our body. While insomnia is a disease that makes people unable to sleep well with a good quality of sleep, or some couldn't even sleep when they have this disease, Therefore, in this research, we will focus on the effect of phones on insomnia. Since phones are one of the most important devices people use nowadays, we couldn't ignore the fact that phones can have a negative impact.

For instance, excessive use of a phone can lead to abnormalities in one's eyesight, potentially affecting one's health. Additionally, excessive phone use can cause stress and instability, as stress can lead to insomnia.

Therefore, this research will show the impact of phones toward insomnia.

1.2 Objectives

1. Learn more about the impact of phones on insomnia.
2. Getting to know if phones can cause insomnia or not and the reason behind this.
3. Focuses on the effects of phones on quality of sleep on humans.

1.3 Expected outcome

We expect that this research will make people aware of their health and the uses of their phones in their hands. We also want to know about the cause of insomnia and the reason behind the insomnia.

Chapter 2

Literature Review

Insomnia is a common sleep disorder. With insomnia, you may have trouble falling asleep, staying asleep, or getting good quality sleep. This happens even if you have the time and the right environment to sleep well. Insomnia can get in the way of your daily activities and may make you feel sleepy during the day. Short-term insomnia may be caused by stress or changes in your schedule or environment. It can last for a few days or weeks. Chronic (long-term) insomnia occurs 3 or more nights a week, lasts more than 3 months, and cannot be fully explained by another health problem. To diagnose insomnia, your healthcare provider may ask about your sleep habits and ask you to keep a sleep diary. Your provider may also recommend healthy lifestyle habits such as a regular sleep schedule, cognitive behavioral therapy for insomnia, and medicines to help you manage your insomnia [8]. And in the results of several studies, it has been suggested that smartphone addiction has negative effects on mental health and well-being [2]. and the smartphone addiction was determined to be an important health problem among high school students [3]. And from some of the surveys, it is shown that people who usually drink alcohol, use smartphones in bed, and are affected by anxiety and depression have a higher smartphone addiction detection rate, and insomnia is adversely associated with smartphone addiction [9]. The extreme inappropriate usage of smartphones results in multiple health and physical issues, including sleeping disorders for either falling asleep or maintaining sleep, eye health, and musculoskeletal systems, as well as traffic and other severe accidents. Meanwhile, smartphone addiction can also cause mental, behavioral, and social issues, and it is related negatively with multiple concepts of health and wellbeing, where smartphone addiction causes attention deficit and maladaptive behavior issues, interferes with school and employment, lowers performance in school, and decreases in-person social contacts [1]. Studies have shown links between smartphone addiction and depression, smartphone addiction and anxiety, and smartphone addiction and stress [5].

Chapter 3

Methodology

3.1 Methods

3.1.1 Participants and procedure

This web-based survey was conducted with high school students at Potisarnpittayakorn School between August 3, 2024, and September 9, 2024 . The participants were informed of the purpose and significance of this study. The participants scanned the questionnaire QR code and completed the questionnaire in their own time. It took approximately 10-15 minutes for participants to complete the survey questionnaire.

3.1.2 Measure

General demographic characteristics

Participants' social demographic data, including gender, age, school year, class, and family status

Smartphone Addiction Scale (SAS-SV)

The smartphone addiction test is a validated instrument to measure smartphone addiction. It contains 10 items that range from 1 (strongly disagree) to 6 (strongly agree), and cutoff scores are set at 31/60 for men and 33/60 from women to indicate the presence of smartphone addiction.

Depression, Anxiety, and Stress Scale (DASS-21)

The depression, anxiety, and stress test is a validated instrument designed to measure the emotional states of depression, anxiety, and stress. It contains 21 items. Each of the three states of the DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest or involvement, anhedonia, and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect.

The stress scale is sensitive to levels of chronic-nonspecific arousal. It assesses difficulty for relaxing, nervous arousal, and coping with feelings of being upset/agitated, irritable/over-reactive, and impatient. The scores for depression, anxiety, and stress are calculated by summing the scores for the relevant items. And cutoff scores are set at 10 for depression, 8 for anxiety, and 15 for stress.

The result scores on the DASS-21 will be multiplied by 2 to calculate the final score.

Relation between Smartphone addiction and Insomnia

The smartphone addiction and insomnia relation test has also been used to indicate whether the participants are addicted to the smartphone or not and if it's related to insomnia. We have created multiple indicators in the questionnaire, which are:

1. The number of daily smartphone checks
2. Duration of daily smartphone usage (hours)
3. Whether the participants carry a charger or a powerbank
4. Whether the participants spend time on the smartphone before falling asleep at night
5. Whether the participants check the smartphone after waking up
6. History of sleep problems
7. Daily sleep time (hours)

Chapter 4

Result

4.1 Tables

Table.1 The distribution of the participants with and without smartphone addiction by some socio-demographic characteristics		
Socio-demographic characteristics	**Smartphone Addiction**	
	No n = 191(56.2)	**Yes n = 149(43.8)**
	n(%)*	**n(%)***
Age group		
15 or lower	42 (57.5)	31 (42.5)
16	70 (56.5)	54 (44.5)
17 or higher	79 (55.2)	64 (44.8)
Gender		
Male	78 (55.3)	63 (44.7)
Female	113 (56.8)	86 (43.2)
Family Status		
Good	130 (58.6)	92 (41.4)
Moderate	60 (54.5)	50 (45.5)
Bad	1 (12.5)	7 (87.5)

The data examines smartphone addiction among students, exploring socio-demographic characteristics and behaviors related to smartphone use and sleep patterns. In Table 1, 56.2% of the participants were not addicted to smartphones, while 43.8% were. Smartphone addiction was more common among students aged 16 (44.5%) and those aged 17 or higher (44.8%). Addiction was slightly more prevalent among males (44.7%) compared to females (43.2%). Family status also played a role, with students from families with poor conditions showing the highest addiction rate at 87.5%.

Table.2 The distribution of the student diagnosed with or without smartphone addiction by some characteristics considered and associated with smartphone addiction and insomnia		
Socio-demographic characteristics	**Smartphone Addiction**	
	No n = 191(56.2)	**Yes n = 149(43.8)**
	n(%)*	**n(%)***
Number of daily smartphone checks		
1-16 times	35 (64.8)	19 (35.2)
17-32 times	89 (72.4)	34 (27.6)
33-48 times	34 (48.6)	36 (51.4)
More than 49 times	33 (35.5)	60 (64.5)
Duration of daily smartphone use (hours)		
Less than 3 hours	16 (76.2)	5 (23.8)
3-4	56 (71.8)	22 (28.2)
More than 4 hours	119 (49.4)	122 (50.6)
Carrying a charger and power-bank		
Yes	134 (54.0)	114 (46.0)
No	57 (61.9)	35 (38.1)
Spending time on smartphone before falling as sleep at night		
Yes	172 (54.6)	143 (45.4)
No	19 (76.0)	6 (24.0)
Checking the smartphone after waking up		
Yes	123 (50.4)	121 (49.6)
No	68 (70.8)	28 (29.2)
History of sleeping problems		
Yes	67 (47.5)	74 (52.5)
No	124 (62.3)	75 (37.7)
Daily hours of sleep (hours)		
Less than 7 hours	75 (50.7)	73 (49.3)
7	71 (64.5)	39 (35.5)
8	26 (49.1)	27 (50.9)
More than 8 hours	19 (65.5)	10 (34.5)

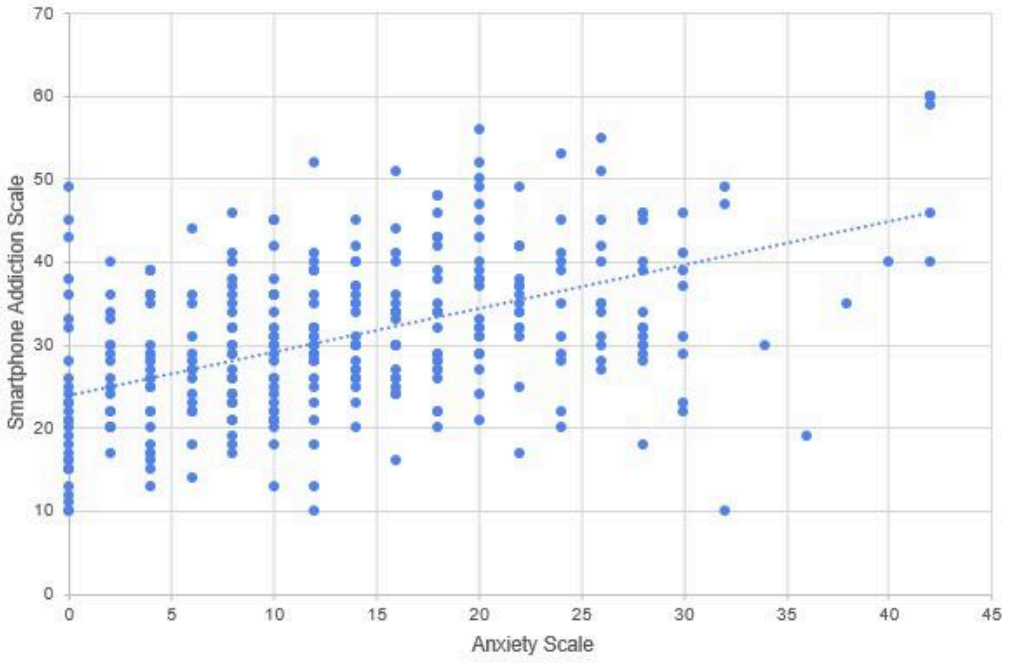
The data in Table 2 emphasizes a significant link between smartphone addiction and sleep issues among students. Those who were addicted to smartphones exhibited a higher likelihood of experiencing sleeping problems. Specifically, 52.5% of the addicted participants reported having a history of sleep-related issues, compared to only 47.5% of those without addiction. Furthermore, smartphone addiction was also connected to shorter sleep durations. Nearly half (49.3%) of the addicted students slept for less than seven hours per night, compared to 50.7% of non-addicted students who managed to get at least seven hours of sleep.

These findings suggest that excessive smartphone use, particularly before sleep, may disrupt sleep patterns and contribute to sleep deprivation. The combination of frequent smartphone checks, prolonged usage throughout the day, and screen time before bed likely interferes with sleep quality, making those with smartphone addiction more prone to sleep-related issues and insufficient rest.

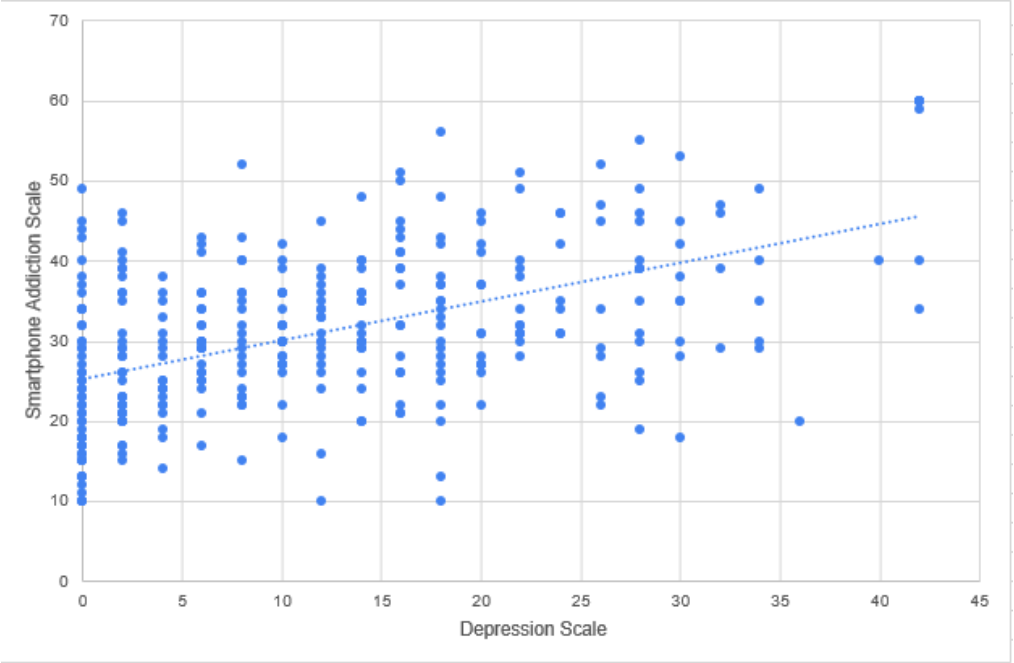
Table.3 The reasons of the participants for smartphone use		
The reasons for the smartphone use	**Number**	**Percentage**
Talking	275	18.3
Texting	314	20.9
Playing games	237	15.7
Social media	304	20.2
Mobile application	268	17.8
Taking photos	107	7.1
Total	1.505	100

Table 3 outlines the main reasons for smartphone use. Texting was the most common reason (20.9%), followed by social media use (20.2%), talking (18.3%), and using mobile applications (17.8%). Other reasons included playing games (15.7%) and taking photos (7.1%). Overall, these findings highlight the various factors associated with smartphone addiction and its impact on students' daily routines and sleep habits.

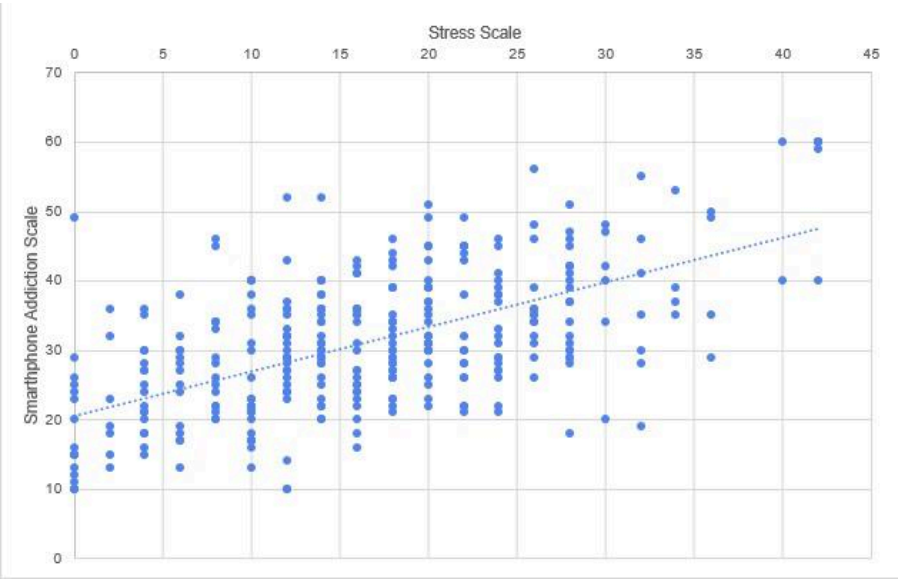
4.2 Scatter plot



- **Anxiety vs. Smartphone Addiction**: The anxiety plot also shows a positive correlation with a trend line similar in steepness to the depression plot. This similarity indicates that both anxiety and depression might similarly influence smartphone addiction levels, potentially due to smartphones serving as a distraction or a way to manage anxiety-related discomfort.



- **Depression vs. Smartphone Addiction**: This plot displays a similar positive correlation but with a slightly steeper trend line compared to the stress plot. This might suggest that depression has a more pronounced influence on smartphone addiction, possibly due to the use of smartphones as a coping mechanism for depressive symptoms.



- **Stress vs. Smartphone Addiction**: The trend line shows a moderate upward trajectory, indicating a steady increase in smartphone addiction as stress levels rise. The distribution is somewhat widespread, suggesting variability in how stress influences smartphone usage among different individuals.

Chapter 5
Conclusion

This research aimed to explore the relationship between smartphone use and insomnia, particularly focusing on high school students. Our findings indicate a significant link between smartphone addiction and sleep disorders, such as insomnia. A substantial proportion of students who exhibited smartphone addiction reported a history of sleep problems, including shorter sleep durations and disrupted sleep patterns.

The data revealed that prolonged smartphone usage, particularly before sleep, contributed to poor sleep quality and increased the likelihood of insomnia. Addiction to smartphones was more prevalent among certain demographic groups, and those with higher addiction levels tended to experience greater sleep disturbances. In addition, the correlation between smartphone addiction and mental health issues such as anxiety, depression, and stress suggests that these psychological factors may exacerbate the negative impact of smartphone usage on sleep quality.

Overall, this study underscores the need for increased awareness regarding the detrimental effects of excessive smartphone use on sleep health. We recommend further research to investigate intervention strategies that may help mitigate smartphone addiction and improve sleep quality among young individuals.

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