Impact of Smartphone Addiction on Sleep Quality and Perceived Stress among Undergraduate Health Professions Students: A Cross Sectional Study

By

Md. Hasnat Parvej

February 2022, held in March 2023

This thesis is submitted in total fulfillment of the requirements for the subject

RESEARCH 2 and 3 and partial fulfillment of the requirements for the degree of

Bachelor of Science in Occupational Therapy

Bangladesh Health Professions Institute (BHPI)
Faculty of Medicine
University of Dhaka

Thesis completed by:

Md. Hasnat Parvej

4th year, B.Sc. in Occupational Therapy

Bangladesh Health Professions Institute (BHPI)

Centre for the Rehabilitation of the Paralysed (CRP) ……..…

Chapain, Savar, Dhaka-1343 Signature

Supervisor's name, designation, and signature:

Md. Saddam Hossain

Lecturer in Occupational Therapy

Department of Occupational Therapy

Bangladesh Health Professions Institute (BHPI)

Centre for the Rehabilitation of the Paralysed (CRP) …….....

Chapain, Savar, Dhaka-1343 Signature

Head of the department's name, designation, and signature:

Sk. Moniruzzaman

Associate Professor & Head

Department of Occupational Therapy

Bangladesh Health Professions Institute (BHPI) ……

Centre for the Rehabilitation of the Paralysed (CRP) Signature

Chapain, Savar, Dhaka-134

Board of Examiner

Statement of Authorship

Except where reference is made in the text of the thesis, this thesis contains no material published elsewhere or extracted in whole or in part form a thesis presented by me for any other degree or diploma or seminar. No others person's work has been used without due acknowledgement in the main text of the thesis. This thesis has not been submitted for the award of any other degree or diploma in any other tertiary institution. The ethical issue of the study has been strictly considered and protected. In case of dissemination of the findings of this project for future publication, it will be duly acknowledged as undergraduate thesis.

Md. Hasnat Parvej

4th year, B.Sc. in Occupational Therapy.

Bangladesh Health Professions Institute

(BHPI)

Centre for the Rehabilitation of the Paralysed (CRP) Signature: ……..

Chapain, Savar, Dhaka: 1343

Acknowledgement

At first I would like to show my gratitude to almighty Allah who has given me the ability to complete this study. I would like to express my special thanks to my parents who always inspired me to complete my studies successfully.

Then I would like to gratefully acknowledge my honorable supervisor Md. Saddam Hossain for his skillful guidance over the study. I am grateful to Principal, Head of the Department of Occupational Therapy, Physiotherapy and Speech and Language Therapy in Bangladesh Health Profession's Institute for giving me permission to collect these data.

Above all I would like to give special thanks to my thesis recruiting volunteer and all the participants of this study.

Dedication

My beloved parents who always inspired me

Table of Contents

List of Tables

List of Abbreviations

BHPI: Bangladesh Health Professions Institute

CRP: Centre for the Rehabilitation of the Paralysed

SPSS: Statistical Package for the Social Science

SAS: Smartphone Addiction Scale

PSQI: Pittsburgh Sleep Quality Index

PSS: Perceived Stress Scale

Abstract

Background: In this era of the smartphone revolution, users are prone to becoming addicted to its convenience. The youth are the most susceptible to smartphone addiction. Since 2000, the smartphone revolution has brought noticeable changes to people's daily lives by providing more convenience. Still, it has also had many adverse effects on interpersonal relationships, psychological well-being, and physical health.

Aim: To find out the impact of smartphone addiction on sleep quality and perceived stress among undergraduate health professions students.

Methods: The study was conducted following a quantitative cross-sectional study design with face to face survey among 532 undergraduate health professions students. These studies use the Smartphone Addiction Scale (SAS) to assess smartphone addiction, to assess the sleep quality of the students, the Pittsburgh Sleep Quality Index (PSQI) was used, and the Perceived Stress Scale-10 (PSS-10) was used to assess perceived stress. Data were analyzed by using Statistical Package for Social Science (SPSS) 26.

Results: The level of smartphone addiction score among the undergraduate health professions students mean was high (105.22 ±22.528), where 99 indicates the presence of smartphone addiction according to SAS. The level of sleep quality score mean was (5.93±2.746). The PSQI Global score mean (7.4±5.1). In this study, sleep quality mean 5.93, so the student's sleep quality is good. The stress level of the student's mean was (18.59±6.176), 72.4% moderate stress level, 9.2% high-stress

level and 18.4% low-stress level. The correlation between smartphone addiction and perceived stress score was statistically significant (p-value=.01), and sleep quality and the perceived stress score were statistically significant (p-value=.00). However, the correlation was not statistically significant (p-value=.101) between smartphone addiction and sleep quality.

Conclusion: This study found smartphone addiction and perceived stress are associated with each other, perceived stress and sleep quality are associated with each other and health professions students get a vital message to maintain their health-related factors and occupations. This study will provide clinicians, health professions students, teachers, parents and policymakers with helpful information on reducing high smartphone addiction and stress and generating healthy sleep and well-being.

Keywords: Undergraduate students, Students, Smartphone addiction, Sleep quality, Perceived Stress.

CHAPTER I: INTRODUCTION

1.1 Background

Smartphones provide a wide range of mobile apps for information, communication, education, and entertainment, and they are becoming more and more necessary in daily life. Mobile Internet connectivity via Wi-Fi or cellular networks, the ability to install smartphone applications, touch screens, and other features like media players, digital cameras, and GPS navigation are all common features of smartphones. No doubt, the smartphone is the most helpful innovation for humankind if used correctly and wisely. It has a vital role in every step of our life. According to Statistics, the current global smartphone user population will be 6.92 billion in 2023, representing 86.34% of the world's population. Starting our day by setting our morning alarm to till night, smartphone helps us a lot in our day-to-day activities (Turne, 2023). Smartphones provide entertainment and socialization opportunities such as online gaming, web browsing, and social media browsing (Alhazmi et al., 2018). According to the Survey made by the Bank of America in the United States reports, 60% of their smartphones are very important in their daily life, for about 96% of Millions are the people aged between18-24. Smartphones an important part of modern life because they allow us to communicate almost a phone signal, connect to the Internet and check e-mails, and use social media (De Masi & Wac, 2022). In Germany alone, 40% of the population uses smartphones excessively, which has been linked to a harmful influence on mental health. It has also been argued that smartphone use may be similar to addiction. It has been suggested that excessive smartphone use may resemble addiction (Kwon et al., 2013). The overuse is also associated with time

distortion, resulting in the smartphone being used longer than intended or perceived (Lin et al., 2015). Furthermore, excessive smartphone use (particularly in the evening) appears to be linked to poor sleep quality (Yogesh et al., 2014) and reduced work engagement (Montag et al., 2015). A study conducted between July 2021 and February 2022, collected data from 440 eligible young adults in Bangladesh via an online survey. According to the study's findings, 61.4% of young adults are addicted to their smartphones (Ratan et al., 2022). But nowadays, most of the persons, especially students, are seriously addicted to these devices, and most student wake up to use them. On the other hand, maximum students affected sleep quality or sleep pattern difficulty, and their stress levels became high perceived or moderate, or low. Smartphones offer numerous benefits in the contemporary modern world, particularly in retrieving immediate information and communication, albeit their overuse may result in detrimental effects such as addiction. Studies on smartphone addiction and its associated problems among university students have been researched extensively in various countries. These include issues related to sleep, as well as psychological anxiety, including stress and depression (Sanusi et al., 2022)**.** Smartphones are popular devices capable of processing more information than other phones; they include many features such as games, access to the Internet and social networks, messaging, videos, multimedia, and navigation, and their use for communication (Demirci et al., 2014). Proper sleep length and quality are essential for physical and mental health and have been found to be related to a variety of adverse outcomes (Franklin C Brown et al., 2002)**.** A significant relationship between sleep length and addictive mobile phone behavior ;without a mobile phones, those who attained less sleep during the week perceived themselves as more stressed and helpless than those who acquired more sleep (Massimini & Peterson, 2009). Sleep is an essential part of

good health and well-being. People with sleep problems are more likely to develop major medical diseases such as obesity, heart disease, high blood pressure, and diabetes (Wiseman-Hakes et al., 2009)**.** The risk of smartphone addiction was not associated with sleep duration; but with attention deficit hyperactivity disorder, depression, anxiety, and stress. In this study, the author suggests that peer education programs prevent to smartphone addiction (Selçuk & Ayhan, 2020).

1.2 Justification of the study

The study could be of importance to the following:

Through this study the health professions students will be able to know the status of using Smart phone addiction sleep quality and perceived stress among the undergraduate health professions students. Health Professions students will be able to determine how many time participants are spending in Smart phone, and is the smartphone uses has any effect on participants sleep quality, feelings stress and also the level among Smartphone Addiction, Sleep Quality and Perceived Stress. This study indicates a growing need to increase awareness of smartphone addiction, healthy sleep habits to improve the quality of sleep and how can we free from stress. In addition, the researcher can verify the accuracy of the information mentioned in the study and provide ideas for related studies. Since the addiction is harmful for us specially smartphone addiction and sleep is an umbrella term also sleep is essential occupation for each and every people life.

1.3 Operational definition

1.3.1 Smartphone addiction: Smartphone addiction is a disease that involves obsessive abuse of mobile devices. It is typically measured by how frequently users

utilize their smartphones and/or how much time they spend online overall during a given time period (Wigmore, 2018).

1.3.2 Undergraduate student's: a student who studying his/her study for their first degree at a college or university.

1.3.3 Health Profession students: Health professions students means the student is any type of the health professions such as medicine, nursing, pharmacy, physician assistants, and other across the continuum of healthcare education, including professional school (such as pharmacy, nursing, medical, institute and school) , as well as graduate education, are referred to as "health professions students"(Accreditation, February 4, 2021).

1.3.4 Stress: According to, World Health Organization (2021), Stress can be defined as any type of change that cause physical, emotional or psychological strain. Stress is your body's response to anything that requires attention or action. Everyone experiences stress to some degree. The way you respond to stress, however, makes a big difference to your overall well-being.

1.3.5 Sleep Quality: Sleep quality is defined as a person self -satisfaction with aqll of the aspects of the sleep experiences. Sleep quality are four category or attributes; sleep efficiency, sleep latency, sleep duration, wake up after sleep onset. Antecedents include physiological (e.g. age, circadian rhythm, body mass index, Non-rapid eye movement, Rapid eye movement), psychological (e.g., stress, anxiety, depression), and environmental factors include: room temperature, television/ device use and family and social commitments. Good sleep quality always positive effects such as feeling rested, normal reflexes, and positive relationships. Poor sleep quality

consequences include fatigue, irritability, daytime dysfunction, slow response and increased alcohol intake (Nelson et al., 2022).

1.4 Study Question, Aim, Objectives

1.4.1 Study Question

What is the Impact of Using Smartphone Addiction on Sleep Quality and Perceived Stress among Undergraduate Health Professions Students?

1.4.2 Aim

To find out the impact of using smartphone addiction on sleep quality and perceived stress among undergraduate health professions students.

1.4.3 Objectives

According to this perspective this study was conducedt the objectives listed below:

- ✓ To find out demographic information among the participants.
- ✓ To find out the level of smartphone addiction among the undergraduate health professions students.
- ✓ To identify the level of sleep quality among the undergraduate health professions students.
- ✓ To identify the level of stress among the undergraduate health professions students.
- ✓ To find out the correlation among the smartphone addiction, sleep quality and stress level.

CHAPTER II: LITERATURE REVIEW

2.1: Overview

The researcher has reviewed some literature related to his research work on Google Scholar, Google, PubMed, Core, Hinari, Scopus. In this section researcher provide a short overview of this literature. This section has reviewed 24 articles in this literature review section, published in the last few years.

2.1.1 Level of smartphone addiction

(Okela, 2022) Suggested that smartphone addiction may positively affect on young adults to improve digital media literacy skills. The impact of emotion regulation on subjective happiness using smartphone addiction (Satıcı & Deniz, 2020). Social contact and applications with entertaining content in smartphone enhance addiction using smartphone for functions such as social media, gaming, online messaging and video watching was assigned to be positively related to smartphone addiction, using smartphone for telephone calls, e-mail and news reading was designated to be negatively related and showed 71.2% of students have health problems associated with using smartphones (Zencirci et al., 2018). Higher rates of smartphone addiction among young Indian adults, which is a matter of concern (Ammati et al., 2018). Since the younger population are more inclined towards using smartphones for activities other than communication, it may affect them in personal, psychological, physical and societal levels, there were 86% of participants used mobile phone for less than 5 hours a day. A descriptive analytical study on 350 undergraduate and post graduate students of Kermanshah University of medical science in 2017 and they were selected through randomly and clustered method. Student's demographic information age, sex, time use in smartphone in a typical day, function of social network was included. The

mean age was 21.83, time use in cell phone 3.3 hours in a day also presence in social network most of the time and highest usage Telegram (99%). This study addressed technology among students rapidly increasing, and there was a significant relationship between the overuse of smartphone and social network that's consequence were hazard and increase addiction level (Mohammadi et al., 2018). Another study in Turkey, and there data were collected from 214 students studying in the nursing department, they have a negative, significant and very weak relationship between smartphone addiction and communication skills. They find out communication skills of nursing students are affected negatively by smartphone addiction(Cerit et al., 2018). A study which was a cross sectional study and 1441 student's both male and female were included in china, mean age were 19.72 years and their 429 students had presented smartphone addiction. Male students were addicted in playing game in smartphone and female were addicted multimedia, social networking, in this study suggests that smartphone addiction may result in psychological and behavioral problems, such as depression, anxiety, and poor sleep quality, and females who scored at the addiction level were more likely to be depressed than males (Chen et al., 2017). A study on Turkey, three hundred and sixty-seven who owned smartphones were given the Smartphone Addiction Scale (SAS), UCLA Loneliness Scale (UCLA- LS), and Brief Social Phobia Scale (BSPS). A great difference was found in the means SAS Score ($p < .001$) between the user who declared that their main purpose for smartphone use was to access social networking sites (Enez Darcin et al., 2016). On the other hand, the University students in Saudi Arabia are at risk of addiction to smartphone, a phenomenon that is associated with negative effects on sleep, of energy, eating habits, weight, exercise, and academic performance, and 27.2% reported spending more than 8 hours per day on their cellphones. Seventy-five percent

used at least four applications each day, largely for social networking and watching news (Alosaimi et al., 2016). Smartphone addiction had negative effect of undergraduate students and correlated with negative effects of academic achievement (Al-Barashdi et al., 2015). A surveys showed of high school and university students are most leading groups of smartphone users (Jurisic & Azevedo, 2011).

2.1.2 Level of sleep quality

A study found quantity, content, and context of social technology use may affect sleep timing and duration in early adolescents (Charmaraman et al., 2021). Adolescents (aged 11 to 15 years) 772 participants in the Northeast U.S. completed an online survey during or after school in spring 2019. Quantity of social technology use (e.g., checking social media, problematic internet behaviors, mobile use), content viewed (e.g., emotional or violent videos, risky behaviors), and social context (e.g., bedtime behaviors, starting social media at an early age) were significantly related to later bedtimes and fewer hours of sleep on school nights. Parental rules restricting mobile phone and online use before bed and obtaining a smartphone at a later age were associated with increased sleep time and earlier bedtime. The daily cumulative mobile phone use and use with the lights off before sleep are associated with poorer sleep quality (Meng et al., 2021). The influence of media on the sleep quality in adolescents, and this investigation discovered to find out the impact of media devices on sleep quality in adolescents (Akçay & Akçay, 2018). Applying a descriptive design, the study was carried out with 9th, 10th and 11th grade students (N=392, 52.0% female, average age 16.04±0.86) who were attending Konya High School between the dates of January 18 and 22, 2016. Changes were seen to occur in the wake-up times of those who had either a television or a computer in their bedrooms. (Nowreen & Ahad, 2018) described that excessive use of smartphones is prevalent

among medical students and is related to poor sleep quality. The cross-sectional study was conducted on 236 students using a self-administered questionnaire consisting of three parts socio-demographic characteristics, smartphone addiction scale (SAS-SV), and Pittsburgh sleep quality index (PSQI).The prevalence of smartphone addiction in this study was found out to be 34.4%. 62.7% were poor sleepers as assessed by PQSI scores. There was a positive correlation between overall PQSI scores and SAS scores. In the subgroups, the correlation was significant for males and those residing in the hostel. Correlations were highly significant for younger age group (17–19) and 1st year of study. Poor sleep quality is closely associated with lifestyle habits including use of mobile cell-phones (Mohammadbeigi et al., 2016). Over use of internet and social networks via smart phones is related to poor sleep quality and quantity. The cross-sectional study was conducted on 380 undergraduate students selected by proportional stratified sampling in Qom, Iran in 2015. Data were collected by two standard questionnaire including Cell-Phone Over-Use Scale (COS) and Pittsburgh sleep quality questionnaire beside the status of usage in cell-phone social networks. T-test, chi-square, Pearson correlation coefficient and multivariate logistic regression were used in data analysis. The mean age of participants was 21.8 ±3.2 yr, 69.1% were female, and 11.7% were married. The mean of COS and sleep quality scores were 48.18 ±17.5 and 5.38 ±2.31, respectively. The prevalence of over-use of cell phone was 10.7% (CI 0.95; 8.8%, 12.6%) and the prevalence of poor sleep quality was 61.7% (CI 0.95; 57.1%, 66.3%). The mean of all aspects and total score of sleep quality showed a direct significant association by cell-phone addiction score except sleep duration score that was inversely. Based on multivariate analysis affected to cellphone addiction, being male gender and studying in general physician level are the most important predictors of poor sleep quality. Proper sleep length and quality are

essential for physical and mental health and have found to be related a variety number of negative outcomes (Brown et al., 2002).

2.1.3 Level of stress

A cross-sectional survey was conducted involving 766 Chinese undergraduate students (74.4% female; M = 20.1 years, SD = 1.15) who were measured with their levels of stress, academic burnout, smartphone use types (social/process smartphone use), resilience, and problematic smartphone use (Hao et al., 2022). Based on the I-PACE theory, built a structural equation model, and the results indicated that compared with social smartphone use, process smartphone use more related to problematic smartphone use; academic burnout fully mediated between stress and process smartphone use, and between stress and problematic smartphone use. Moreover, resilience moderated between stress and academic burnout, between academic burnout and process smartphone use, and between academic burnout and problematic smartphone use. They discuss the process smartphone use as a key indicator of problematic smartphone use and the role of academic burnout for linking stress and smartphone use behaviors. In addition, interventions for enhancing resilience should be launched in the future. In Heilongjiang Province, China, 769 medical college students were given a questionnaire. Participants filled out questionnaires about their perceived stress, smartphone addiction, negative emotions, and psychological capital. To investigate the relationships between variables, Pearson's correlation analysis was utilized. Hayes' PROCESS macro was used to analyses a moderated mediation model. Negative emotions mediate the relationship between perceived stress and smartphone addiction, and psychological capital is a key moderator in the initial stage of the mediation process (Wang et al., 2021). A study (Shen & Wang, 2019) conducted about impact of loneliness on excessive smartphone

use among Chinese college students and its internal mechanism. Using a sample of 549 smartphone users, they found that for entertainment motivation, it was a mediator between loneliness and excessive smartphone use and perceived stress moderated the relationship between the mediator (entertainment motivation) and excessive smartphone use. Additionally, for escapism motivation, loneliness could affect excessive smartphone use only through the mediating role of escapism motivation. Their findings demonstrated the importance of unsolved life problems in facilitating excessive smartphone use and could provide a new perspective for researchers to design interventions for excessive smartphone users. (Matar Boumosleh & Jaalouk, 2017) Conducted a survey of 688 participants by random sampling and the study participants mean age was 20.9, SD= 1.88; 53% that included a) questions regarding socio-demographics, academics, lifestyle behavior, personality type, and smartphone use variables: b) the 26-item Smartphone Addiction Inventory (SPAI) Scale; and c) brief depression and anxiety screeners (PHQ-2 and GAD-2), the two core DSM-IV items for major depressive disorder and generalized anxiety disorder, respectively, as well as other independent positive predictors of smartphone addiction, such as depression and anxiety, appeared. It's possible that young adults with personality type are stressed out and depressed way lack positive stress coping mechanism and mood management techniques and thus highly susceptible to smartphone addiction. In Heilongjiang Province, China, 769 medical college students were given a questionnaire. Participants filled out questionnaires about their perceived stress, smartphone addiction, negative emotions, and psychological capital. To investigate the relationships between variables, Pearson's correlation analysis was utilized. Hayes' PROCESS macro was used to analyses a moderated mediation model. Negative emotions mediate the relationship between perceived stress and smartphone addiction,

and psychological capital is a key moderator in the initial stage of the mediation process (Wang et al., 2021). A study founded that Smartphone addiction had a positive impact on mood disorders. It also caused a negative impact on health, family relationship, social relationship, and academic performance of the high school students and smartphone addiction had negative impacts on students' health. Some of them experienced neck and finger pain since they had used their Smartphone playing games, chatting, and surfing internet for long hours (Sinsomsack & Kulachai, 2018).

2.1.4 Correlation among the smartphone addiction, sleep quality and stress level

A first national survey investigating the association of using smartphone addiction on sleep quality and perceived stress among 420 participant dental students in Jordan and the demographic information of the students such as age, gender, year of the study, satisfaction of the profession were included. In this study the age of participants mean 20.9 years and they were male and female students, studying were in First year, second year, third year, fourth year and fifth year and maximum students were satisfied with their profession's (Sanusi et al., 2022). The percentage of using smartphone on a typical day is ≥5 hours and 6 -10 minutes which is indicative high frequency of smartphone addiction. In their study showed a high level of smartphone addiction amongst the student's, smartphone addiction and perceived stress were significantly associated with sleep quality. They showed the students who have high level of smartphone addiction or high perceived stress levels experienced poor sleep quality.

(Chatterjee & Kar, 2021) Described that the high prevalence of excessive smartphone usage among medical students is a cause for concern and is detrimental to their health and sleep quality. The research addresses current lacunae in correlating smartphone addiction with smartphone usage before sleeping and right after waking up. Risky

behavior adoption and pervasive mood changes associated with excessive smartphone use are addressed with equal representation across semesters. A study which was conducted in University Kebangsaan Malaysia, there was a positive and highest correlation between smartphone addiction and perceived stress, while the least correlation was between sleep quality and perceived stress also smartphone addiction alarming negative implication on behavior (Samat et al., 2020). A questionnaire-based online survey by a professional research agency for a period of four months from August to September of 2016. Participants in this research included South Korean college students were chosen at random. Out of these, 608 college students who had cellphones and had shown interest in the study were finally included. The majority of the participants were under 20 years old, and more women than men made up the participant population. The questionnaires were fully filled out by each participant without any gaps. There was no personal information included in the poll, which was performed anonymously. In this study statistically significant relation found between smartphone addiction and stress level, the students which groups using overused smartphone had high stress level (Kim et al., 2019). A meta-analysis reported a small to medium significant correlation between smartphone use and stress, anxiety level (Vahedi & Saiphoo, 2018). Smartphone have become ubiquitous in people's lives to an extent that necessitates the investigations of their negative impact (Hawi & Samaha, 2017). The scarcity of such investigations triggered our interest in examining the relationship among smartphone addiction, anxiety, and family relations. There were a correlation between mobile apps usage at night on sleep pattern. The heavier the usage of smartphone apps, the more sleep quantity and quality goes down (Haque et al., 2017). The cross-sectional study involved Year-2 till Year-5 medical students of UnikL RCMP. The sample size was selected to be 214 students with 95% confident

level, by using Opine application. The Quota sampling method was used. This study result showed that usage of smartphone apps during class could lead to losing of attention.

2.2 The gap of this study listed below:

1. Data is based on self- report (people may not respond honestly) (F. C. Brown et al., 2002).
2. Study sample was 9th ,10th ,11th ,12th grade students(Akçay & Akçay, 2018).
3. The funding source had no role in the design and conduct the study, data collection, analysis management and interpretation of data (Charmaraman et al., 2021)
4. Sleep hygiene was relatively neglected, engaging in sleep rituals, avoiding taking naps (F. C. Brown et al., 2002).
5. Inadequate time allocated for the research to be done especially during data collection. (Haque et al., 2017).

2.3 Study conducted In Bangladesh Health Profession's Student's

In Bangladesh few study conducted college and university students about smartphone addiction and its harmfulness. There was no study about the status of using smartphone addiction on sleep quality and perceived stress amongst the undergraduate health professions students.

CHAPTER III: METHODS

3.1 Study Design

3.1.1 Quantitative Method

The researcher selected Quantitative methodology for this research. Quantitative research is an approach for learning about a specific group or number of people known as a sample population. Quantitative research applies scientific inquiry and depends on data that is observed or measured to explore questions about the sample population (Allen, 2017).

3.1.2 Study Approach

In this study the researcher, conduct Cross sectional approach. A cross sectional study is a form of observational study that assesses data from variables collected across a sample population at one point in time. In a cross-sectional study, the researcher concurrently measures the outcome and the exposures in the study participants (Setia, 2016). In this case of this study, some population data has to be collected at a certain time point and since there is a time limit, the researcher has to complete the study at a certain time. There are some benefits of cross-sectional study. Researchers can collect all the variables at once. This study is suitable for descriptive analysis and multiple results can be studied at once, as it allows the researcher to collect data quickly in a short time, so the researcher chooses the cross-sectional stud. It is very quick and easy to gather information from a large group of people.

3.2 Study Setting and Period:

The study was conducted in the Bangladesh Health Professions Institute, the academicals institute of Centre for the Rehabilitation of Paralysed (CRP). The study will be conducted April 2022 to February 2023.

3.3 Study Participants

3.3.1 Study Population

The study population is a subset of the target population from which the sample is drawn. It is more extensive than the concept sample frame. It is possible to define sample frame as an operationalized version of research population (Bickman & Rog, 2008). In this study the population is Bangladesh Health Professions Institute (BHPI) students. The target population was undergraduate health professions students studying in Year 1 until Year 4 who enrolled for the 2022/2023 academic year at the BHPI. The largest affordable population was obtained from the first objective to determine the level of smartphone addiction amongst undergraduate's health professions students at BHPI using the formula to estimate a single mean with a 95% confidence interval (CI). Potential participants would have to be smartphone users. Potential participants would have smartphone users.

3.3.2 Inclusion Criteria

1. Undergraduate students of both male and female studying at BHPI .
2. Participants will be Smart phone User.

3.4 Ethical considerations

3.4.1 Ethical considerations

- The Researcher seeks permission from the institutional ethical review board through the department of Occupational Therapy, BHPI (Bangladesh Health Professions Institute).
- The purpose of the study explained to all participants.
- Confidentiality of personal information strictly maintained.
- The researcher was concerned about the effect of biasness, as the study sample selected based on inclusion & exclusion criteria.
- The researcher committed to answer any study related questions or inquiries from the participants.
- The researcher didn't force the participants to participate in the study against their interest.
- All sources were cited and acknowledged properly.

3.4.2 Informed Consent

The Department of Physiotherapy, Occupational Therapy and Speech and Language Therapy will approach the Institutional Review Board (IRB) of the Bangladesh Health Professions Institute to request ethical clearance.

3.4.3 Unequal Relationship

In this study the researcher maintained power relationship through recruitment will be done in the field of data collection. Data gathering for this study the researcher will involve recruiting volunteers, and initially volunteers will be trained then they collect data.

3.4.4 Risk and beneficence

Participants will have no risk to participate in this study.

Participants will be informed about the confidentiality of their information.

Researcher will not pay the participants for giving information.

3.4.5 Power Relationship

Power relationships were strictly maintained in this study. In this study, the researcher did all the data collection by recruiting volunteers. The researcher trained the recruiting volunteer in several sessions about the data collection procedure, instrument, participant's information sheet, withdrawal form, how can he reach the participants and carry data from them. The recruiting volunteers collect data from the participants with high confidence.

3.5 Data Collection Process

3.5.1 Participants Recruitment Process

At first, the researcher took permission from the Bangladesh Health Professions Institute, the academicals institute of Centre for the Rehabilitation of Paralyzed (CRP), Physiotherapy, Occupational Therapy and Speech and Language therapy department to take data from the students. After getting permission researcher was contacting with the recruiting volunteer for data collection. Researchers appoint third party for maintaining power relationship and he went to the undergraduate health profession students from different years in lecture hall settings prior to the commencement of their respective classes. They were able to understood on the purpose of the study, and then the students who consented to participated provided informed consent. All participants were given the questionnaires. Respondents were

given time to fill in the questionnaire or to ask any questions related to it. The questionnaires were then collected immediately upon completion.The researcher will try to reach through recruiting volunteer about total students both male and female in Bangladesh Health Profession Institute.

3.5.2 Data Collection Method

The Researcher will collect data by recruitment volunteers through face-to-face survey. Face to face, survey method is used when a specific target population is involved. Face-to-face surveys are characterized by the fact that an interviewer calls on, or meets with, the respondent and conducts the interview. The interviewer reads out the questions and records the respondent's answers. This can be done either in the form of a paper- and pencil interview or a computer-assisted personal interview (Groves et al., 2011).The researcher engage the volunteers travels Physically to the participant's location to conduct this face-to-face survey.

3.5.3 Data Collection Instrument

1. Pittsburgh Sleep Quality Index (PSQI)
2. Perceived Stress Scale (PSS)
3. Smartphone addiction scale (SAS)

3.5.4 Survey Tool

Smartphone addiction was assessed using the Smartphone Addiction Scale (SAS) which comprises 33 items using a six- point Likert scale. In this scale first 1 indicate strongly disagree to 6 indicates strongly agree. Additionally, characteristics of smartphone use were evaluated using four questions on the following: (i) duration of smartphone use on a typical day (hours); (ii) frequency of smartphone use on a typical day; (iii) how soon one uses (his/her) smartphone, when wake up in the morning

(within minutes/hours); (iv) the most personally relevant function of smartphone which include nine responses namely "Facebook." "phone calls," "play games," "text messaging," "e-mailing," "watching videos," "listening to music," "reading news" and "others."

To measure or assess the sleep quality Pittsburgh Sleep Quality Index (PSQI) was used the participants' sleep quality and sleep disruptions over the previous month. There are 19 items in PSQI with seven principal components assessing subjective sleep quality, sleep latency, sleep du- ration, habitual sleep efficiency, sleep disturbance, use of sleep medication and daytime dysfunction. The PSQI global score can range from 0 to 21 points. Actual scores ranged from 0 to 20, with an overall group mean of 7.4, a median of 6.0, and a standard deviation of 5.1(Buysse et al., 1989).

Evaluation of responses to perceived stress in the preceding month was carried out using the Perceived Stress Scale-10 (PSS- 10) which consisted of 10 elements ranging from 0 to 5 on a 5-point Likert Scale 0 to 4 (0 = never to 4 = very often). The total score was calculated by reversing the scores of four positive items (items 4, 5,7, and 8) followed by total all 10 items across. The total score can range from 0-40, with higher stress level indicated by higher scores.

All questionnaires (SAS, PSQI and PSS-10) were self- administered and considering that all students were literate in Bangla language from English version. A pilot test was done on 10 students, and they reported that they understood all questions. All students can read and write in Bengali because it is the teaching language. In addition, collected information on the profile of students including age, sex, year of study,

whether profession was one's own choice and whether one was satisfied with health profession as career choice.

3.5.7 Field test of Questionnaire

The researcher done the field test through recruiting volunteer before going to the main data collection because it was very important part for the researcher to check the validity of the study. Field test was a preparation of starting final data collection. It helped to make a plan that how the data collection can be carried out, difficulties during questioning, appropriate wording, easiness of understanding the questionnaire and may any change. The researcher had informed the participants about the aim and objective of the study. Researcher conducted the field test by 10 participants through recruiting volunteer in Physiotherapy, Occupational therapy, Speech and language therapy department students. Researcher informed them through recruiting volunteer about the interview time and questionnaire by the field test. Researcher using Bangla questionnaire for data collection. The recruiting volunteer informed the researcher that participants need 50 minutes and did not face difficulty to fill up the questionnaires. Finally the questionnaire were used for conducting the main study.

3.6 Data Analysis

The IBM SPSS software version 26.0 was used for statistical analysis. The study calculated frequency and percentage values for the respondents' personal characteristics satisfaction with the study, sex, year of the study, smartphone during use, typical in a day, most frequent function. Spearman correlations of coefficients were used to calculate consistency values for analysis smartphone addiction, perceived stress and sleep quality. Furthermore, nonparametric test was done because the data was not normally distributed along with smartphone addiction scale,

perceived stress and sleep quality mean and standard deviation values using Mann whitney U test. On the other hand smartphone addiction and year of the study and the finding was Kruskal-Walies Test.

3.7 Quality control and quality assurance

The researcher used standardized scale to ensure the validity and reliability of the measurement. The data were collected from Bangladesh Health Professions Institute, CRP-Savar. All participants received similar questions and environments so that the quality was assured for the participants.

CHAPTER IV: RESULTS

4.1 Characteristics of Respondents

Table 4.1 Socio-demographic characteristic of respondents

Variables		Frequency (N)	Percent (%)
Year of the students	1st year	259	48.7
	2nd year	109	20.5
	3rd year	92	17.3
	4th year	72	13.5
Gender	Male	197	37.0
	Female	335	63.0
Satisfaction with profession	Yes	525	98.7
	No	7	1.3
Study department	Occupational Therapy	167	31.4
	Physiotherapy	213	40.0
	Speech & Language Therapy	156	28.6

A total of 650 respondents took part in this study. There 532 had completed answer and Table 1 represent the characteristic of the respondents. The respondents age ranged between 18 to 26 years old, mean age of (21.3 ±1.7). The percentage of male and female students is 37.0% and 63.0%. The physiotherapy students is 40.0%, occupational therapy students is 31.4%, speech and language therapy students is 28.6% and they are studying 1st year to 4th year. The respondent's students 98.7% is satisfied with their profession and 1.3% is not satisfied with their profession.

4.2 Characteristics of Respondents Smartphone use

Table 4.2 Smartphone use amongst respondents (N= 532)

Variables		Frequency (N)	Percent (%)
Duration of use on a typical day	1-6 Hours	425	79.9
	7-12 Hours	92	17.3
	13-18 Hours	15	2.8
	Mean (SD)=(1.23 ±.483)	Maximum =3	Minimum =1
Frequency of use on a typical day	1-14 times	375	70.3
	15-28 times	130	24.4
	29-42 times	28	5.3
	Mean (SD)=(1.35 ±.577)	Maximum =3	Minimum =1
Time until first use in the morning	Within 1-6 minutes	335	63.0
	Within 7-12 minutes	111	20.9
	After more than 12 minutes	86	16.2
	Mean (SD)=(1.53 ±.757)	Maximum =3	Minimum =1
Functions of smartphone use most frequently	Facebook	400	75.3
	Phone call	273	51.4
	Game	209	39.4
	Text massage	250	47.1
	E-mail	60	11.3
	Watching videos	298	56.1
	Listening music	239	45.0
	Reading newspaper	150	28.2
	Others	82	15.4

About the characteristics of smartphone use of respondent's duration of use on a typical day 79.9% student's use 1 to 6 hours, 17.3% use 7 to 12 hours, and 2.8% use 13 to 18 hours. In terms of frequency use a typical day 70.3 students 1 to 14 times/ day, 24.4% students use 15 to 28 times/day, 5.3% use 29 to 42 times/ day. The time

until first use of smartphone in the morning is within 1 to 6 minutes 63.0%, within 7 to 12 minutes 20.9% and after more than 12 minutes 16.2%. Most frequently use relevant function use of smartphone Facebook, answered 75.3% and frequency 400, Phone calls answered 51.4% and frequency 273, Gaming answered 39.4% and frequency 209, Text messaging answered 47.1% and frequency 250, E-mailing answered 11.3% and frequency 260, Watching videos 56.1% and frequency 98, Listening music answered 45.0% and frequency 239, Reading news answered 28.2% and frequency 150, others answered 15.4% and frequency 82.

4.3 level of the smartphone addiction, stress, and sleep quality among the respondents

Table 4.3: level of the smartphone addiction, stress, and sleep quality among the respondents

Variable		**Frequey (N)**	**Percent (%)**	**Mean**	**Standard deviation (SD)**
Smartphone addiction				105.22	22.528
Stress	Low stress(0-13)	98	18.4	18.59	6.176
	Moderate stress(14-26)	385	72.4		
	High stress (27-40)	49	9.2		
Sleep quality				5.93	2.746

The mean of smartphone addiction is (105.22 ±22.528). The level of smartphone addiction of respondent is present because the smartphone addiction scale scoring was 1 to 198 where the score less than 99 indicating low smartphone addiction and greater than 99 indicating present smartphone addiction. So the respondents presented smartphone addiction. On the other hand, the mean of PSS-10 was (18.59 ± 6.176). According to the Perceived stress scale low stress indicate (0 to 13), moderate stress

score (14 to 26), High perceived stress (27 to 40). In this table 3 showed 98 respondents that is 18.4% has low stress, 385 respondents is 72.4% has moderate stress and 49 respondents that is 9.2% has High perceived stress. The sleep Quality score mean showed (5.93 ±2.746). The PSQI global score can range from 0 to 21 points. Actual scores ranged from 0 to 20, with an overall group mean of 7.4, a median of 6.0, and a standard deviation of 5.1.In table 3 showed sleep quality mean 5.93, so the respondents sleep quality is good.

4.4 Smartphone addiction score by respondents characteristics

Table: 4.4 Smartphone addiction score by respondents characteristics

	Year of the study	**N**	**Mean Rank**	**Chi-square**	**Degree of Freedom (df)**	**P value**
Smartphone addiction score	1st Year	259	276.80	8.116	3	.044
	2nd Year	109	237.16			
	3rd Year	92	251.63			
	4th year	72	292.86			
	sex	**N**	**Mean Rank**	**Mann-Whitney U**	**Z**	**P value**
	Female	335	259.36	30605.000	-1.398	.162
	Male	197	278.64			
	Satisfaction					
	Yes	525	266.46	1817.500	-.050	.961
	No	7	269.36			

Table 4.4 showed that Smartphone addiction score of respondents was done between Sum of Smartphone Addiction and Year of the study and the finding was Kruskal-Walies Test, P value was .044 which is less than .05. So there was a statistically significant relation between respondent year of the study and Smartphone addiction.

Table four also showed that the satisfaction of the profession of respondents and sex; male and female smartphone addiction level. The P value = .162 which is greater than .05 and that's why there was no significant between male and female respondents. On the other hand satisfaction of the profession respondent's p value = .961 which is greater than .05 and that's why there was not statistically significant between satisfaction of the profession and smartphone addiction of respondents.

4.5 Correlation among the smartphone addiction, sleep quality and stress level

Table:4.5 Correlation among the smartphone addiction, sleep quality and stress level

	Smartphone addiction	**Sleep Quality**	**Perceived Stress**
Smartphone addiction	1.000	.055	.110**
Sleep Quality	.055	1.000	.152**
Perceived Stress	.110**	.152**	1.000

Table 4.5 showed Spearman's rank order correlation was used to explore the relationship between smartphone addiction, Pittsburgh sleep quality and perceived stress among the respondents. The rank order correlation was found very little between smartphone addiction and perceived stress and there *r_p (532) = .110, p = .006* that means *p<.01* so there is a very low correlation. The rank order correlation was found very little between Pittsburgh Sleep Quality and perceived stress and there *r_p (532)= .152, p =.000* that means *p<.01* so there is a very low correlation. But the rank order correlation was not presented between smartphone addiction and Pittsburgh sleep quality because there there *r_p (532)= .055, p =.101* that means *p>.01* so there is a no correlation.

CHAPTER V DISCUSSION

5.1 Discussion

Smartphone technology is primarily used to improve calling and receiving services. Mobile networks have made communication more comfortable, convenient, and comfortable. However, mobile phones are now used for purposes other than making and receiving phone calls. These include social networking, internet use, and photography, listening to music, watching movies, and watching clips. Since smartphone has become an essential lifeline for today's young and old.

To my knowledge, this is the first descriptive survey of Bangladesh Health Profession's Institute students to find out the status of using smartphone addiction on sleep quality and perceived stress amongst the undergraduate health professions students. The mean of smartphone addiction scale score of students was (105.22± 22.528). This result will be comparable with Jordanian dental students, which reported mean smartphone addiction scale score was male and female (107.9 ±27.66) and (110.5 ± 22.46). On the other hand the Korean study reported mean SAS score was 110.02 and the Turkish study mean is 75.76. So definitely, the finding is higher, indicating smartphone addiction risk among BHPI students compared to Turkish Students. This study shows statistically significant differences ($p< 0.05$) in mean rank year of the study of students, but the Jordanian dental students study were not statistically significant.

This study shows male and female student's SAS score has not statistically significant differences ($p> 0.05$). (Sahin et al., 2013) also showed similarly that there is no difference between male and female students mobile phone use in Sakarya University in Pakistan and also (Bianchi & Phillips, 2005) stated that there are not statistically

significant differences between male and female with regard to mobile phone addiction. This study stated that student SAS score and satisfaction with the profession are not statistically significant ($p>.05$), and if it is compared the Jordanian dental students, the finding is totally different and there was statistically significant ($p<.05$). In this study the using smartphone on a typical day 1-6 hours among the health professions students and the percentage is 79.9.

Another study showed of Saudi university students using smartphone on a typical day >5 hours that is called high usage, and the percentage is 73.4% (Ibrahim et al., 2018). A study also showed the Jordanian dental students use their smartphone ≥5 hours on a typical day 50.7% (Sanusi et al., 2022). Besides a study showed the addiction level is high if the students use smartphones >5 hours (Sahin et al., 2013). If we compared this percentage and time use in a typical day definitely, the health professions student's high usage the smartphone.

In my study the health professions student's frequency of use smartphone 1-14 times/day and the percentage are (70.3%) where 14 times indicate higher frequency usage. (Sanusi et al., 2022) Showed their study in Jordanian dental students used the smartphone 6-10 times/day, and they are (39.5%) where 10 times indicate higher frequency usage. In the study of Turkish university students' study showed that if the frequency of smartphone use is increased, the addiction is increased.

The finding of the function of smartphone use most frequently in my study of health professions students application of Facebook, phone calls, games, Text message, E-mail, Watching- videos, Listening to music, Reading newspaper, others (graphics) and the Facebook frequency is higher, and it is 75.3% then Watching Videos 56.1%. If we comparing it with Jordanian dental students the study showed that using Facebook

frequency is higher, and it was 79.3%, then Watching Videos 7.6% (Sanusi et al., 2022). According to a study smartphone addiction carried out an analysis of the usage of the application or function that is most frequently used (Ahn et al., 2014).

The study finding the level of Perceived stress of undergraduate health profession's student's mean (18.59 ±6.176), and the moderate stress level percentage is a maximum of 72.4%. Another study showed PSS level of their study, which was conducted in Saudi Arabia Taibah University medical students. In their study, they collected data from 367 students, and their finding were that the mean (22.12 ±7.12), and the moderate stress level was 55% (AlAteeq et al., 2020). So the finding of my study participants presented a serious risk of moderate stress. The study will also present moderate stress of the participants if we compared another chines study the aged group was 18-29 years, and the stress level of the participants mean (14.2 ±6.2), thus undergraduate students in this age group was found to have a potentially higher stress level among those participants.

This study found the Pittsburgh sleep Quality Index score mean showed (5.93 ± 2.746). The PSQI global score can range from 0 to 21 points. Actual scores ranged from 0 to 20, with an overall group mean of 7.4, a median of 6.0, and a standard deviation of 5.1.In table 3 showed sleep quality mean 5.93, so the respondents sleep quality is good. This finding is not congruent if we compared Saudi Arabia, Riyadh dental students PSQI mean (7.6 ± 2.9) (Elagra et al., 2016). The another study which was conducted in India Showed the PSQI mean was (2.63 ±2.08) (Asawa et al., 2017). So we compared the finding the health profession's student's PSQI is higher than Indian study but lower than Saudi study.

This study finding also showed Spearman's rank order correlation was used to find out the relationship between Smartphone addiction, the sleep quality and Perceived stress among the respondents. The rank order correlation was found very little between smartphone addiction and perceived stress and there *r_ (p) (532) = .110, p = .006,* which means *p<.01* so there is a very low correlation. The rank order correlation was found very low between Pittsburgh Sleep Quality and perceived stress and there *r_ (p) (532)= .152, p =.000* which means *p<.01,* so there is very low correlation. But the rank order correlation was not presented between smartphone addiction and Pittsburgh sleep quality because there *r_ (p) (532)= .055, p =.101,* which means *p>.01,* so there is no correlation. On the other hand , another study conducted by Jordanian dental student's found a little correlation (r=0.137, p= 0.05) between smartphone addiction and sleep quality (Sanusi et al., 2022). My study finding is also contrary to the Turkish studies, where the result evaluated the relationship between SAS and Sleep Quality (Demirci et al., 2014).

CHAPTER VI: CONCLUSION

6.1 Strength and limitation:

In this study, the strength side is we know about the frequency of smartphone addiction level, sleep quality level and stress level of health profession's student's. It is the first cross sectional study in health profession's student's the status of using smartphone addiction, sleep quality and perceived stress.

There are some limitations of this study. Firstly it is cross sectional study which is conducted by a specific time and point, so in this study not allow cause and effect relationship among the smartphone addiction, sleep quality and perceived stress of health professions students. Second, the total students was not respond because in this time most of the students was examination, some of them was placement session and some of them was absent when the data collection was started. Although stress is an umbrella term, there was not providing any stress management technique, only find out the participant's level of stress.

6.2 Practice Implication

6.2.1 Recommendation for future Practice

Teamwork, counseling, follow stress management technique educational roles, physical exercise related game such as, Football, Cricket, Badminton, Carom, Volleyball may be reduce the smartphone addiction and perceived stress. Knowledge and awareness should be increase that prevents the smartphone addiction. Furthermore, activities such as conferences and interviews within the faculty should be organized to raise student awareness of smartphone addiction, and especially

health professions students should be encouraged to participate in community and group training on smartphone addiction during their professional practices.

6.2.2 Recommendation for future Research

In future longitudinal study should be better to determine cause and effect relationship among the smartphone addiction, sleep quality and perceived stress of health profession's students. More research is need to reduce student's smartphone addiction and stress management for college, high school and university level.

6.3 Conclusion:

Health is a complete state of physical, social, mental satisfaction and wellbeing and not merely an absence of disease or infirmity. If we fit to our health, our mind will be fresh and if our mind will fresh we were free from stress. Nowadays Smartphone are essential part or tools for our everyday life, especially the youth are the big users and they use it for their social interaction, communication, internet service and others. This study finding smartphone addiction and perceived stress are associated with each other, perceived stress and sleep quality associated with each other and health professions students get a vital message to maintain their health related factor and occupation. Since healthy sleep is demonstrated to be important for development. Hope this study provides clinicians, health professions students, teacher, parents and policymaker with useful information for a healthy well-being. We should always try to reduce lower usage from social networks in smartphone and other function.

LIST OF REERENCE

Accreditation (February 4, 2021). "Who are the health professions students described in the Engages Students Criterion?". from https://www.accme.org/.

Ahn, H., et al. (2014). "A systemic smartphone usage pattern analysis: focusing on smartphone addiction issue." Int J Multimed Ubiquitous Eng 9(6): 9-14.

Akçay, D., & Akçay, B. D. (2018). The influence of media on the sleep quality in adolescents.TurkJPediatr,60(3),255-263. https://doi.org/10.24953/turkjped.2018.03.004

AlAteeq, D. A., Aljhani, S., & AlEesa, D. (2020). Perceived stress among students in virtual classrooms during the COVID-19 outbreak in KSA. Journal of Taibah University Medical Sciences, 15(5), 398-403.

Al-Barashdi, H. S., Bouazza, A., & Jabur, N. H. (2015). Smartphone addiction among university undergraduates: a literature review. Journal of Scientific Research & Reports, 4(3), 210-225.

Allen, M. (2017). The SAGE encyclopedia of communication research methods. SAGE publications.

Asawa, K., Sen, N., Bhat, N., Tak, M., Sultane, P., & Mandal, A. (2017). Influence of sleep disturbance, fatigue, vitality on oral health and academic performance in Indian dental students. Clujul medical, 90(3), 333.

Austin, C. (2001). Impact of cell phone disruptions on perceptions and impressions. Journal of Experimental Social Psychology, 13(2), 141-154.

Babbie, E. R. (2010).The practice of social research. Belmont, CA: Wadsworth Publishing Company.

Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. Cyberpsychology & behavior, 8(1), 39-51.

Bickman, L. and D. J. Rog (2008). The SAGE handbook of applied social research methods, Sage publications.

Brown, F. C., Buboltz, W. C., Jr., & Soper, B. (2002). Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. Behav Med, 28(1), 33-38. https://doi.org/10.1080/08964280209596396

Buysse, D. J., Reynolds, C. F., 3rd, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res, 28(2), 193-213. https://doi.org/10.1016/0165-1781(89)90047-4

Charmaraman, L., Richer, A. M., Ben-Joseph, E. P., & Klerman, E. B. (2021). Quantity, Content, and Context Matter: Associations Among Social Technology Use and Sleep Habits in Early Adolescents. Journal of adolescent health, 69(1), 162-165. https://doi.org/10.1016/j.jadohealth.2020.09.035

Chatterjee, S. and S. K. Kar (2021). "Smartphone addiction and quality of sleep among Indian medical students." Psychiatry 84(2): 182-191.

Chen, B., Liu, F., Ding, S., Ying, X., Wang, L., & Wen, Y. (2017). Gender differences in factors associated with smartphone addiction: a cross-sectional study among medical college students. BMC psychiatry, 17(1), 1-9.

Demirci, K., et al. (2014). "Validity and Reliability of the Turkish Version of the Smartphone Addiction Scale in a Younger Population." Klinik psikofarmakoloji bülteni 24(3): 226-234.

Elagra, M. I., Rayyan, M. R., Alnemer, O. A., Alshehri, M. S., Alsaffar, N. S., Al-Habib, R. S., & Almosajen, Z. A. (2016). Sleep quality among dental students and its association with academic performance. Journal of International Society of Preventive & Community Dentistry, 6(4), 296.

Enez Darcin, A., Kose, S., Noyan, C. O., Nurmedov, S., Yılmaz, O., & Dilbaz, N. (2016). Smartphone addiction and its relationship with social anxiety and loneliness. Behaviour & Information Technology, 35(7), 520-525.

Groves, R. M., Fowler Jr, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2011). Survey methodology. John Wiley & Sons.

Haque, A. E., et al. (2017). "Usage of mobile applications at night and its association with sleep pattern and academic performance of the medical students of UniKL-RCMP, Ipoh, Malaysia." Journal of Global Pharma Technology 9(9): 15-24.

Hawi, N. S., & Samaha, M. (2017). Relationships among smartphone addiction, anxiety, and family relations. Behaviour & Information Technology, 36(10), 1046-1052.

Henry, G. T. (1990). Practical sampling, Sage.

Ibrahim, N. K., et al. (2018). "Mobile phone addiction and its relationship to sleep quality and academic achievement of medical students at King Abdulaziz University, Jeddah, Saudi Arabia." Journal of research in health sciences 18(3): e00420.

Jurisic, B., & Azevedo, A. (2011). Building customer–brand relationships in the mobile communications market: The role of brand tribalism and brand reputation. Journal of Brand Management, 18, 349-366.

Kim, H.-J., Min, J.-Y., Kim, H.-J., & Min, K.-B. (2019). Association between psychological and self-assessed health status and smartphone overuse among Korean college students. Journal of Mental Health, 28(1), 11-16.

Massimini, M., & Peterson, M. (2009). Information and communication technology: Affects on US college students. Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 3(1).

Meng, J., Wang, F., Chen, R., Hua, H., Yang, Q., Yang, D., Wang, N., Li, X., Ma, F., Huang, L., Zou, Z., Li, M., Wang, T., Luo, Y., Li, Y., & Liu, Y. (2021). Association between the pattern of mobile phone use and sleep quality in Northeast China college students. Sleep & breathing, 25(4), 2259-2267. https://doi.org/10.1007/s11325-021-02295-2

Mohammadbeigi, A., et al. (2016). "Sleep quality in medical students; the impact of over-use of mobile cellphone and social networks." Journal of research in health sciences 16(1): 46.

Mohammadi, S., Valinejadi, A., Saman, J. A., Karimpour, H., Kaivanfar, M., Safaeipour, M., Mohammadi, A., & Kawyannejad, R. (2018). Assessment of addiction to internet, smartphone and social networks among students of medical sciences: a cross sectional study. Electronic Journal of General Medicine, 15(4).

Nelson, K. L., et al. (2022). Sleep quality: An evolutionary concept analysis. Nursing Forum, Wiley Online Library.

Nowreen, N., & Ahad, F. (2018). Effect of smartphone usage on quality of sleep in medical students. National journal of physiology, pharmacy and pharmacology, 8(10), 1366-1370. https://doi.org/10.5455/njppp.2018.8.0620009062018

Sahin, S., Ozdemir, K., Unsal, A., & Temiz, N. (2013). Evaluation of mobile phone addiction level and sleep quality in university students. Pak J Med Sci, 29(4), 913-918. https://doi.org/10.12669/pjms.294.3686

Sanusi, S. Y., Al-Batayneh, O. B., Khader, Y. S., & Saddki, N. (2022). The association of smartphone addiction, sleep quality and perceived stress amongst Jordanian dental students. European Journal of Dental Education, 26(1), 76-84.

Selçuk, K. T., & Ayhan, D. (2020). The relationship between smartphone addiction risk and sleep duration and psychosocial comorbidities in health professional candidates. Perspect Psychiatr Care, 56(3), 541-546. https://doi.org/10.1111/ppc.12465

Setia, M. S. (2016). "Methodology series module 3: Cross-sectional studies." Indian journal of dermatology 61(3): 261.

Sinsomsack, N. and W. Kulachai (2018). A study on the impacts of Smartphone addiction. 15th International Symposium on Management (INSYMA 2018), Atlantis Press.

Vahedi, Z., & Saiphoo, A. (2018). The association between smartphone use, stress, and anxiety: A meta-analytic review. Stress and Health, 34(3), 347-358.

Wigmore, I. (2018). "smartphone addiction (cell phone addiction)." from https://www.techtarget.com/whatis/.

Wiseman-Hakes, C., et al. (2009). "Sleep and wake disorders following traumatic brain injury: a systematic review of the literature." Critical Reviews™ in Physical and Rehabilitation Medicine 21(3-4).

APPENDICES

Appendix A: Approval letter/Permission Letter

Approval letter:

Ref: CRP-BHPI/IRB/……..

Date: ……

To

Md. Hasnat Parvej

4th Year B.Sc. in Occupational Therapy

Session: 2017-18 Student ID: **122170274**

BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal " " by ethics committee.

Dear Md. Hasnat Parvej,

Congratulations.

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned dissertation, with yourself, Md. Saddam Hossain as thesis supervisor. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation/thesis/research Proposal
2	Questionnaire (English & / or Bengali version)
3	Information sheet & consent form.

The purpose of the study is to identify the association of using smartphone addiction on sleep quality and perceived stress amongst the undergraduate health profession's student's. The study involves use of a standardized questionnaire instruments to identify **"The Impact of Smartphone Addiction on Sleep Quality and Perceived Stress among Undergraduate Health Professions Students"** that may take 50 to 60 minutes to answer questionnaire , Smartphone Addiction Scale (SAS), Pittsburgh Sleep Quality Index (PSQI) and Perceived Stress Scale (PSS) instruction or precaution for collection of specimen and there is no likelihood of any harm to the participants in the study may benefit the participants, not by financially but this study indicates a growing need to increase awareness of prevent smartphone addiction,healthy sleep habits, quality and stress level. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at ……. AM on ……., 20….. at BHPI (…….th /st /nd IRB Meeting) .

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

……..

Member Secretary, Institutional Review Board (IRB)

BHPI, CRP, Savar, Dhaka-1343, Bangladesh

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref: CRP-BHPI/IRB/09/22/637 Date: 28/09/2022

To
Md. Hasnat Parvej
4th Year B.Sc. in Occupational Therapy
Session: 2017-18; Student ID: **122170274**
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal "Impact of Smart phone Addiction on Sleep Quality and Percieved Stress among Undergraduate Health Professions Students: A Cross Sectional study" by ethics committee.

Dear Md. Hasnat Parvej,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned dissertation, with yourself, Md. Saddam Hossain as thesis supervisor. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation/thesis/research Proposal
2	Questionnaire (English & / or Bengali version)
3	Information sheet & consent form.

The purpose of the study is to identify the impact of Smart phone addiction on sleep quality and perceived stress among undergraduate health professions students. The study involves use of a standardized questionnaire instruments to identify the impact of Smart phone addiction on sleep quality and perceived stress among undergraduate health professions students that may take 50 to 60 minutes to answer questionnaire, Smartphone addiction Scale (SAS), Pittsburgh Sleep Quality Index (PSQI) and Perceived Stress Scale (PSS) instruction or precaution for collection of specimen and there is no likelihood of any harm to the participants in the study may benefit the participants, not by financially but this study provide clinicians, health professions students, teachers, parents and policymakers with helpful information on reducing high smartphone addiction and stress and generating healthy sleep and well-being. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 8:30 AM on 27th August, 2022 at BHPI (32nd IRB Meeting).

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

Muhammad Millat Hossain
Associate Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Permission Letter

Date: 7 November, 2022

To

Head of the Department

Bangladesh Health Professions Institute (BHPI)

CRP-Chapain, Savar, Dhaka-1343

Subject: Prayer for permission to collect data for the research project.

Sir,

With due respect to state that, I am a student of 4th year B. Sc. in Occupational Therapy of Bangladesh Health Professions Institute (BHPI). In 4th year, I have to submit a research project to the University of Dhaka in partial fulfillment of recruitments of the degree of Bachelor of Science in Occupational Therapy. My research title is **"The Impact Smartphone Addiction on Sleep Quality and Perceived Stress among Undergraduate Health Professions Students"** As it is cross sectional study of quantitive research, I want to take your permission to get my data in Bangladesh Health Professions Institute students.

So, I therefore pray and hope that your kind enough to give me permission to take data from students that help me to complete the research successfully.

I remain

Sir

Hasnat Parvej

4th year B. Sc.in Occupational Therapy, BHPI

Signature	**Signature**	**Signature**
---------- Sk. Moniruzzaman Head of Occupational Therapy Bangladesh Health Professions Institute (BHPI)	---------- Head of Physiotherapy Bangladesh Health Professions Institute (BHPI)	---------- Md. Sazzad Hossain Head of Speech & language Therapy Bangladesh Health Professions Institute (BHPI)
Comment of the course coordinator	**Comment of the course coordinator**	**Comment of the course coordinator**

Date: 7 November, 2022

To

The Principal

Bangladesh Health Professions Institute (BHPI)

CRP-Chapain, Savar, Dhaka-1343

Subject: Prayer for permission to collect data for the research project.

Sir,

With due respect to state that, I am a student of 4th year B. Sc. in Occupational Therapy of Bangladesh Health Professions Institute (BHPI). In 4th year, I have to submit a research project to the University of Dhaka in partial fulfillment of recruitments of the degree of Bachelor of Science in Occupational Therapy. My research title is **"~~The Association of Using~~ Impact of Smart Phone Addiction ~~on~~, Sleep Quality and Perceived Stress Amongst the Undergraduate Health Professions Students"** As it is cross sectional study of quantitive research, I want to take your permission to get my data from the students of Bangladesh Health Professions Institute (BHPI).

So, I therefore pray and hope that your honor would be kind enough to take data from students that help me to complete the research successfully.

I remain

Sir
Hasnat
Hasnat Parvej

4th year B.Sc. in Occupational Therapy

Session : 2017-18

Bangladesh Health Professions Institute (BHPI).

Signature	Signature	Signature
Sk. Moniruzzaman Head of Occupational Therapy Department Bangladesh Health Professions Institute (BHPI)	07.11.22 Md. Shofiqul Islam Head of Physiotherapy Department Bangladesh Health Professions Institute (BHPI)	Md. Sazzad Hossain Head of Speech & language Therapy Department Bangladesh Health Professions Institute (BHPI)
Comment: Forwarded for your permission	**Comment:** Recommended	**Comment:** Forwarded

Allowed
7.11.2022
Prof. Md. Obaidul Haque
Vice-Principal
BHPI, CRP, Savar, Dhaka.

Appendix B:Information Sheet and Consent form

Research topic: "The Impact of Smartphone Addiction on Sleep Quality and Perceived Stress among Undergraduate Health Professions Students"

Researcher: I am Md. Hasnat Parvej B.Sc in Occupational Therapy Department, 4th Year, Session:2017-2018 Bangladesh Health Professions Institute (BHPI) CRP, Savar 1343.

Supervisor: Md. Saddam Hossain.

Lecturer, Bangladesh Health Professions Institute (BHPI) Place of Research: Bangladesh Health Professions Institute (BHPI)

Part 1 Information Sheet

Introduction:

I am Hasnat Parvej, B.Sc.in Occupational Therapy, of Bangladesh Health Professions Institute under Faculty of Medicine, University of Dhaka. As a 4th year student in the department of occupational therapy, I am studying in the undergraduate program (2017- (2018) session. It is mandatory to conduct a research project to complete the BSc program in occupational therapy from BHPI. This research project is conducted by the lecturer of the department of occupational therapy supervision of MD. Saddam Hossain. Through this Participant Information and Letter, the purpose of the research project, the data collection method and how the subjects related to the study will be protected will be presented to you in detail. If you are willing to participate in this study, then this study Decision-making will be easier if you have a clear understanding of the issues involved. However, we do not have to confirm your participation here. Before taking any decision, you may, if you wish, discuss the

matter with a relative, friend or confidant. On the other hand, read the Participant Information Sheet. If you have trouble understanding any content or need to know more about something, feel free can ask questions

Context and objective of the research:

You are invited to participate in this study so that you may be aware of the involvement of smartphone addiction and perceived stress on your sleep quality. This research will promote the health and well-being of the participants regardless of the type of work or functional activity and the demographic factors that are at risk for the participants. This will improve their academic performance or future career and help in developing appropriate interventions

Here are the things involved in participating in this research project:

Before you sign the consent form, you will be presented with detailed information about the conduct of the research project through this Participant Information Sheet. If you wish to participate in this study, you must sign the consent form. Participants will then be asked to complete a standard questionnaire which may take 55-60 minutes. This questionnaire will contain questions on socio-demographic factors (eg: age, gender, experience).The information collected will be kept confidential and your identity will not be revealed. If you do not consent, you do not have to participate. You may withdraw your participation without providing any explanation to the researcher until the time of data incorporation, even if you have given consent.

What are the benefits and risks of participation?

During the course of the research project you may have to answer some personal questions which may make you feel very unprepared. You do not have to participate

if you do not wish to do so. On the other hand, you may not directly benefit from participating in this study, but your valuable participation will help to learn about the correlation of smartphone use addiction on sleep quality and perceived stress among healthcare students. It is expected that there is no additional risk, inconvenience or discomfort in participating in the research concerned.

Will the confidentiality of the information be guaranteed?

By signing this consent form, you have given permission for the research staff involved in this research project to collect and use your personal information. Any information collected for this research project that could identify you will remain confidential. Information collected about you will be referred to in a coded manner. Only the researcher directly concerned and his/her supervisor will have access to these data. De-identified data will be used for further data analysis. The documents will be kept in a locked cabinet. Data collection will be done at the Occupational Therapy Department of BHPI and on the researcher's personal laptop.

It is expected that the results of this research project will be published and presented in various forums. In the case of any publication or presentation, the information will be provided in such a way that you cannot be identified without your consent. Data will be initially collected from documents.

Where to contact to know about research?

If you want to contact us about the research project or have any questions about the research project, you can ask now or at any time later. In that case you can contact the researcher on the mentioned number 01869031589.

This research project was reviewed and approved by the Institutional Ethics Committee of Bangladesh Health Professions Institute, Savar (CRP- BHPI IRB (09/22/637). Any person concerned or complaining about the conduct of this research project should contact the Institutional Ethics Committee at (7745464-5).

Can I withdraw myself from research?

You may withdraw your participation without providing any explanation to the researcher until prior to data incorporation, even if you have given consent.

Part 2 :Consent Form

This study is a part of the study of Occupational Therapy Department and the researcher name is Md. Hasnat Parvej. He is a 4th year student of B.Sc in Occupational Therapy Department of Bangladesh Health Professions Institute, and his research topic is "**The Impact of Smartphone Addiction on Sleep Quality and Perceived Stress among Undergraduate Health Professions Students**".

A participant in this study and I clearly understand the purpose of this study. I may withdraw my participation at any time prior to the inclusion of data in this study. I will not be obliged to answer to anyone for this. I understand that I will not suffer any harm as a result of participating in this study. All the information from this research interview will be used for research purposes, they will be completely confidential and my name and identity will not be published.

I will consult with the supervisor of this study to answer any questions about the study's methodology, complications, or benefits. I am aware of all the above information and consent to participate in this study.

Signature of Participant: ……..

Date: …….

Signature of researcher: .....

Date: ……..

Signature of witness: .....

Date: ……..

Participant Withdrawal Letter:

(Applicable to Voluntary Withdrawal Only)

Participant Name: ……

Reason for withdraw:

……..

……..

……

……

Signature of Participant: ……..

Date: …….

Signature of researcher: .....

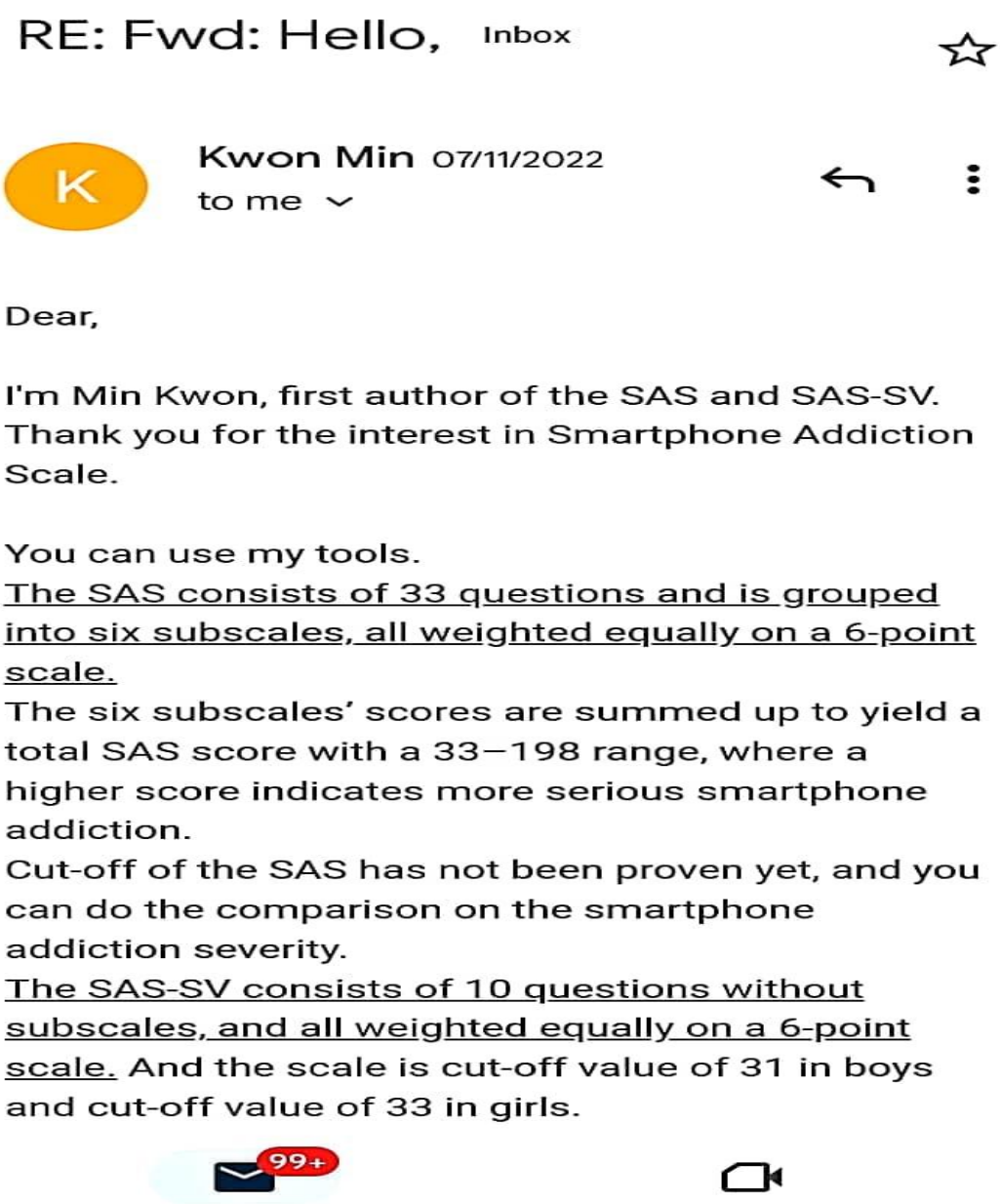
Date: ……..

Signature of witness: .....

Date: ……..

Appendix C:Questionnarie Instrument Scale

Questionnarie Instrument Scale Authore Permission



RE: Fwd: Hello, Inbox

Kwon Min 07/11/2022
to me

Dear,

I'm Min Kwon, first author of the SAS and SAS-SV. Thank you for the interest in Smartphone Addiction Scale.

You can use my tools.
The SAS consists of 33 questions and is grouped into six subscales, all weighted equally on a 6-point scale.
The six subscales' scores are summed up to yield a total SAS score with a 33−198 range, where a higher score indicates more serious smartphone addiction.
Cut-off of the SAS has not been proven yet, and you can do the comparison on the smartphone addiction severity.
The SAS-SV consists of 10 questions without subscales, and all weighted equally on a 6-point scale. And the scale is cut-off value of 31 in boys and cut-off value of 33 in girls.

scale.
The six subscales' scores are summed up to yield a total SAS score with a 33–198 range, where a higher score indicates more serious smartphone addiction.
Cut-off of the SAS has not been proven yet, and you can do the comparison on the smartphone addiction severity.
The SAS-SV consists of 10 questions without subscales, and all weighted equally on a 6-point scale. And the scale is cut-off value of 31 in boys and cut-off value of 33 in girls.

I attach the material you ask me and you can review this information through to attach paper.
Please let me know about the results of future studies.
Good luck for your study and keep me posted of your progress.

Best Regards,

MIN KWON, RN, PhD.
Assistant Professor
Department of Nursing, The University of Suwon
17 Wauan-gil, Bongdam-eup, Hwaseong-si,
Gyeonggi-do, Korea

--- Original Message ---
From : "Hasnat Khan"
<hasnatparvej522@gmail.com>
To : sooy@catholic.ac.kr
Date : 2022/11/07 월요일 오후 3:33:48
Subject : Hello,

How are you? I hope you are doing well. Sir, I am Bangladeshi. I am a health professional student University of Dhaka. I conduct a thesis title " Association of smartphone addiction among the undergraduate health professions students" In my thesis i need "smartphone addiction scale manual component and scoring criteria " please sir, help me and give me the scale documents. I am waiting for your reply.

From,
Bangladesh.
MD. Hasnat Khan.

SOO YANG, RN, PhD
Dean & Professor
College of Nursing
The Catholic University of Korea,
222 Banpodaero, Seocho-Gu

From,
Bangladesh.
MD. Hasnat Khan.

SOO YANG, RN, PhD
Dean & Professor
College of Nursing
The Catholic University of Korea,
222 Banpodaero, Seocho-Gu
Seoul, 137-701, Korea
Phone : +82 2 2258 1062


PDF
12. Develop...n Scale.pdf


PDF
14. The Sma...ort Ve~.pdf


PDF
English Ver...SAS-SV.pdf


99+

Sarliza Yasmin... 31/10/2022
to me

Assalamualaikum wrh wbr dear Hasnat,

Please find the attached items that you need. These are originally not ours, but we also got it from the original authors. All the best for your research.

Kind regards,

Sarliza Yasmin

Sarliza Yasmin Sanusi
Lecturer
Unit of Paediatric Dentistry
School of Dental Sciences
Universiti Sains Malaysia
Kubang Kerian 16150
Kelantan, Malaysia
Phone:+6097675819
Fax:+6097675505

Researcher ID: C-3775-2017
Google Scholar ID: iWCbXpYAAAAJ
Scopus ID: 55568454000
Orcid ID: 0000-0003-2761-2376

From: Hasnat Khan <hasnatparvej522@gmail.com>

From: Hasnat Khan <hasnatparvej522@gmail.com>
Sent: 31 October 2022 15:14
To: Sarliza Yasmin Sanusi <sarliza@usm.my>
Subject: Hello

Show quoted text

There are five parts to this questionnaire (Part I - Part V). Please answer <u>ALL</u> questions.

Part I: Respondent's Information sheet

Instruction: Please fill in the blanks/ tick (√) the **most** appropriate answer.

Age: _____years

Sex: ☐ Male ☐ Female

Year of study: ☐ 1

☐ 2

☐ 3

☐ 4

Department of the study: 1. Physiotherapy

2. Occupational Therapy

3. Speech and Language Therapy

I am satisfied with Health profession as my career choice: ☐ Yes ☐ No

Part II: Characteristics of Smartphone Use

Instruction: Please fill in the blanks/ tick (√) the **most** appropriate answer.

No.	Question	Answer
1	Duration of smartphone use on a typical day (in minutes/ hours)	_____ minutes or _____ hours
2	How many times do you use your smartphone on a typical day?	_____ times/day
3	How soon do you use your smartphone as soon as you wake up in the morning (within minutes/ hours)?	_____ minutes or _____ hours

4	**Most** personally relevant smartphone function	□ Social networking □ Phone calls □ Play games □ Text messaging □ E-mailing □ Watching videos □ Listening to music □ Reading news □ Others

Part III: Assessment of Smartphone Addiction

Instruction: Please tick (√) the **most** appropriate answer that applies to you.

Items		**Strongly disagree**	**Disagree**	**Weakly disagree**	**Weakly agree**	**Agree**	**Strongly agree**
1	Missing work that has been planned due to smartphone use						
2	Having a hard time concentrating in class, while doing assignments, or						

Items		Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
	while working due to smartphone use						
3	Experiencing lightheadedness or blurred vision due to excessive smartphone use						
4	Feeling pain in the wrists or at the back of the neck while using a smartphone						
5	Feeling tired and lacking adequate sleep due to excessive smartphone use						
6	Feeling calm and comfortable while using a smartphone						
7	Feeling pleasant or excited while using a smartphone						
8	Feeling confident while using a smartphone						

Items		Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
9	Being able to get rid of stress with a smartphone						
10	There is nothing more fun to do than using my smartphone						
11	My life would be empty without my smartphone						
12	Feeling most open-minded while using a smartphone						
13	Using a smartphone is the most fun thing to do						
14	Won't be able to stand not having a smartphone						
15	Feeling impatient and anxious when I am not holding my smartphone						
16	Having my smartphone in my						

Items		Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
	mind even when I am not using it						
17	I will never give up using my smartphone even when my daily life is already greatly affected by it						
18	Getting irritated when bothered while using my smartphone						
19	Bringing my smartphone to the toilet even when I am in a hurry to get there						
20	Feeling great meeting more people via smartphone use						
21	Feeling that my relationships with my smartphone friends are more intimate than my						

Items		Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
	relationships with my real-life friends						
22	Not being able to use my smartphone would be as painful as losing a friend						
23	Feeling that my smartphone friends understand me better than my real-life friends						
24	Constantly checking my smartphone so as not to miss conversations between other peoples on twitter or facebook						
25	Checking SNS (Social Networking Service) sites like Twitter or Facebook right after waking up						
26	Preferring talking						

Items		Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
	with my smartphone friends rather than hanging out with my real-life friends or with the other members of my family						
27	Preferring searching from my smartphone rather than asking other people						
28	My fully charged battery does not last for one whole day						
29	Using my smartphone longer than I had intended						
30	Feeling the urge to use my smartphone again right after I stopped using it						
31	Having tried time and again to shorten my						

Items		Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
	smartphone use time, but failing all the time						
32	Always thinking that I should shorten my smartphone use time						
33	The people around me tell me that I use my smartphone too much						

Part IV: Assessment of Sleep Quality

Instruction: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the **most** accurate response for the majority of days and nights in the past month.

---

1. During the past month,

   (a) When have you usually gone to bed at night?

   USUAL BED TIME _____

   (b) How long (in minutes) has it usually took you to fall asleep each night?

   NUMBER OF MINUTES _____

   (c) When have you usually gotten up in the morning?

   USUAL GETTING UP TIME _____

   (d) How many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)

   HOURS OF SLEEP PER NIGHT _____

INSTRUCTIONS: Please tick (√) the **most** appropriate answer that applies to you.

---

2. During the past month, how often have you had trouble sleeping because you…..

	Not during the past	**Less than once a week**	**Once or twice a week**	**Three or more**

		month			**times a week**
(a)	…cannot get to sleep within 30 minutes				
(b)	…wake up in the middle of the night or early morning				
(c)	…have to get up to use the bathroom				
(d)	…cannot breathe comfortably				
(e)	…cough or snore loudly				
(f)	…feel too cold				
(g)	…feel too hot				
(h)	…had bad dreams				
(i)	…have pain				
(j)	Other reason(s), please describe _____ _____				
	How often during the past month have you had trouble sleeping because of this?				

		Very good	**Fairly good**	**Fairly bad**	**Very bad**
3.	During the past month, how would you rate				

	your sleep quality overall				
		Not during the past month	**Less than once a week**	**Once or twice a week**	**Three or more times a week**
4.	During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?				
5.	During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
		No problem at all	**Only a very slight problem**	**Somewhat of a problem**	**A very big problem**
6.	During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?				

Part V: Perceived Stress Scale

Instructions: The following questions ask about your feelings and thoughts since last month. Please circle the scale based on how often you feel or think in a certain way.

0 = Never; 1 = Almost Never; 2 = Sometimes; 3 = Fairly often; 4 = Very often.

In the last month, how often have you ……..

	Never	**Almost never**	**Sometimes**	**Fairly often**	**Very often**
1. ……. been upset because of something that happened unexpectedly?	0	1	2	3	4
2. ……. been unable to control the important things in your life?	0	1	2	3	4
3. ……. felt nervous and 'stressed'?	0	1	2	3	4
4. ……. felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. ……. felt that things were going your way?	0	1	2	3	4
6. ..... found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. ……. been able to control irritations in your life?	0	1	2	3	4
8. ..... felt that you were on top of things?	0	1	2	3	4
9. ……. been angered because of things that were outside of your control?	0	1	2	3	4

10. ……. felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Appendix D: Questionnaire (Bangla)

অংশগ্রহণকারীর তথ্যঃ

১. আপনার নামঃ.....
২. আপনার বয়সঃ.....
৩. লিঙ্গঃ (টিক (√) চিহ্ন দিন)
   ১. পুরুষ ২. নারী
৪. আপনি কোন বিভাগে পড়াশোনা করছেন?
   - ফিজিওথেরাপি
   - অকুপেশনাল থেরাপি
   - স্পিচ এন্ড ল্যাংগুয়েজ থেরাপী
৫. কোন ইয়ারে পড়াশোনা করছেনঃ (টিক (√) চিহ্ন দিন)
   - ১ম
   - ২য়
   - ৩য়
   - ৪র্থ
৬. আপনি আপনার প্রফেশন কে নিয়ে সন্তুষ্ট? (টিক (√) চিহ্ন দিন)
   - হ্যাঁ
   - না

স্মার্টফোন ব্যবহারের বৈশিষ্ট্য

নির্দেশনা: অনুগ্রহ করে শূন্যস্থান পূরণ করুন/ টিক (√) চিহ্ন সবচেয়ে উপযুক্ত উত্তর দিন।

নাম্বার	প্রশ্ন	উত্তর
১	একটি সাধারণ দিনে স্মার্টফোন ব্যবহারের	.....মিনিট অথবা

	সময়কাল (মিনিট/ঘণ্টায়)	.....ঘন্টা
২	আপনি একটি সাধারন দিনে কতবার আপনার স্মার্টফোন ব্যবহার করেন?	.....বার/দিন
৩	আপনি সকালে ঘুম থেকে ওঠার সাথে সাথে আপনার স্মার্টফোনটি কত তাড়াতাড়ি ব্যবহার করেন (মিনিট/ঘন্টার মধ্যে)?	.....মিনিট অথবা .....ঘন্টা
৪	সবচেয়ে ব্যক্তিগতভাবে আপনার স্মার্টফোনের কোন ফাংশনটি বেশি ব্যবহার করেন?	(টিক (√) চিহ্ন দিন) ● ফেসবুক ● ফোন কল ● গেম খেলা ● টেক্সট মেসেজিং ● ইমেইলিং ● ভিডিও দেখা ● গান শোনা ● খবর পড়া ● অন্যান্য

স্মার্টফোন এডিকশন স্কেল: (Smartphone addiction scale)

নিচের মানদন্ড অনুযায়ি যেই সূচক আপনার সাথে মিলে সেইটা গোল বৃত্ত (০) চিহ্ন দিন:

প্রশ্ন	১ = দৃঢ়ভাবে অসম্মতি	২ = অসম্মতি	৩ = কম অসম্মতি	৪ = কম সম্মতি	৫ = সম্মতি	৬ = দৃঢ় ভাবে সম্মতি
১. আমার স্মার্টফোন ব্যবহারের কারণে পরিকল্পিত কাজে বিঘ্নতা ঘটে	১	২	৩	৪	৫	৬
২. আমার ক্লাসে মনোনিবেশ করতে, অ্যাসাইসমেন্ট করার সময় বা কাজের সময় স্মার্টফোন ব্যাবহারের কারণে খুব কষ্ট হচ্ছে	১	২	৩	৪	৫	৬
৩. অত্যধিক স্মার্টফোন ব্যবহারের কারণে হালকা মাথা ব্যথা বা ঝাপসা দৃষ্টি অনূভব করা	১	২	৩	৪	৫	৬
৪. স্মার্টফোন ব্যবহার করার সময় কব্জিতে বা ঘাড়ের পিছনে ব্যথা অনুভব করা	১	২	৩	৪	৫	৬
৫. অতিরিক্ত স্মার্টফোন ব্যবহারের কারণে ক্লান্ত বোধ করা এবং পর্যাপ্ত ঘুমের অভাব	১	২	৩	৪	৫	৬
৬. স্মার্টফোন ব্যবহার করার সময় প্রশান্তি অনূভব করা	১	২	৩	৪	৫	৬
৭. স্মার্টফোন ব্যবহার করার সময়	১	২	৩	৪	৫	৬

আনন্দদায়ক বা উত্তেজিত বোধ করা						
৮. স্মার্টফোন ব্যবহার করার সময় আত্মবিশ্বাসী বোধ করা	১	২	৩	৪	৫	৬
৯. স্মার্টফোন এর জন্য স্ট্রেচ থেকে মুক্তি পেতে সক্ষম হচ্ছেন	১	২	৩	৪	৫	৬
১০. আমার স্মার্টফোন ব্যবহার করার চেয়ে মজার চেয়ে মজার আর কিছু নেই।	১	২	৩	৪	৫	৬
১১. আমার স্মার্টফোন ছাড়া আমার জীবন শূন্যতা বা খালি হবে	১	২	৩	৪	৫	৬
১২. স্মার্টফোন ব্যবহার করা সময় সবচেয়ে ভালো বোধ করা	১	২	৩	৪	৫	৬
১৩. স্মার্টফোন ব্যবহার করা সবচেয়ে মজার জিনিস	১	২	৩	৪	৫	৬
১৪. স্মার্টফোন না থাকলে দাঁড়াতে পারবো না	১	২	৩	৪	৫	৬
১৫. আমি যখন আমার স্মার্টফোনটি ধরে রাখি না তখন অধৈর্য বোধ করি	১	২	৩	৪	৫	৬
১৬. আমি যখন স্মার্টফোন ব্যবহার করছি না তখনও মনের মধ্যে এটিই থাকে	১	২	৩	৪	৫	৬
১৭. আমার দৈনন্দিন জীবন ইতি মধ্যে ব্যাপকভাবে অন্য কিছুতে প্রভাবিত হয়ে গেলেও আমি আমার স্মার্টফোন ব্যবহার করা ছেড়ে দেব না	১	২	৩	৪	৫	৬
১৮. আমার স্মার্টফোন ব্যবহার করার সময় বিরক্ত হলেও এটা ব্যবহর করা হচ্ছে	১	২	৩	৪	৫	৬
১৯. আমার স্মার্টফোনটি টয়লেটেও নিয়ে আসি	১	২	৩	৪	৫	৬
২০. স্মার্টফোন ব্যবহারের মাধ্যমে আরও বেশি লোকের সাথে দেখা করার জন্য দুর্দান্ত অনুভব করছি	১	২	৩	৪	৫	৬
২১. অনুভব করছি যে আমার স্মার্টফোন এর সাথে সম্পর্কগুলি বেশি ঘনিষ্ট আমার প্রকৃত বন্ধুদের তুলনায়	১	২	৩	৪	৫	৬
২২. আমার স্মার্টফোন ব্যবহার করতে না পারাটা বন্ধু হারানোর মতোই বেদনাদায়াক হবে। অনুভব করছি যে আমার স্মার্টফোন বন্ধুরা আমাকে আমার বস্তব জীবনের বন্ধুদের চেয়ে ভালো বোঝে	১	২	৩	৪	৫	৬
২৩. ক্রমাগত আমার স্মার্টফোন চেক করছি যাতে অন্য লোকদের সাথে কথোপকথন মিস না হয় (টুইটার বা ফেসবুক)	১	২	৩	৪	৫	৬
২৪. ঘুম থেকে উঠার পরপরই এসএমএস (সোশ্যাল নেটওয়ার্কিং সার্ভিস) টুইটার বা ফেসবকে চেক করা হচ্ছে	১	২	৩	৪	৫	৬
২৫. আমার বাস্তব জীবনের বন্ধুদের সাথে বা পরিবারের অন্যান্য সদস্যদের সাথ আড্ডা দেওয়ার চেয়ে আমার স্মার্টফোন বন্ধুদের সাথে কথা বলা	১	২	৩	৪	৫	৬

পছন্দ বেশি						
২৬. অন্য লোকেদের জিজ্ঞাসা করার চেয়ে আমার স্মার্টফোন থেকে অনুসন্ধান করা পছন্দ করি	১	২	৩	৪	৫	৬
২৭. অন্য লোকেদের জিজ্ঞাসা করার চেয়ে আমার স্মার্টফোন থেকে কোনো কিছু খুজে বের করা বা অনুসন্ধান করা বেশি পছন্দ করি	১	২	৩	৪	৫	৬
২৮. আমার সম্পূণ্ চার্জ করা ব্যাটারি একদিন বা সারাদিন স্থায়ী হয় না	১	২	৩	৪	৫	৬
২৯. আমার স্মার্টফোনটি আমার ইচ্ছার চেয়ে বেশি সময় ব্যবহার করছি	১	২	৩	৪	৫	৬
৩০. আমার স্মার্টফোনটি আবার ব্যবহার করবো বলে মাঝে মাঝে বন্ধ রাখছি	১	২	৩	৪	৫	৬
৩১. আমার স্মার্টফোন ব্যবহারের সময় কমানোর জন্য বার বার চেষ্টা করেছি, কিন্তু সব সময় ব্যর্থ হইতেছি	১	২	৩	৪	৫	৬
৩২. সবসময় ভাবি যে আমার স্মার্টফোন ব্যবহারের সময় কমানে উচিত	১	২	৩	৪	৫	৬
৩৩. আমার আশেপাশের লোকেরা আমাকে বলে যে আমি আমার স্মার্টফোন খুব বেশি ব্যবহার করি	১	২	৩	৪	৫	৬

পিটসবার্গ স্লিপ কোয়ালিটি ইনডেক্স (PSQI)

নির্দেশনাবলী: নিম্নলিখিত প্রশ্নগুলি শুধুমাত্র গত মাসে আপনার স্বাভাবিক ঘুমের অভ্যাসের সাথে সম্পর্কিত। আপনার উত্তর গত মাসে বেশিরভাগ দিন এবং রাতের জন্য সবচেয়ে সঠিক উত্তর নির্দেশ করা উচিত। অনুগ্রহপূর্বক সব প্রশ্নে উত্তর দিন:

১. গত মাসে, আপনি সাধারণত রাতে কয়টার সময়ে ঘুমাতে গেছেন?

উত্তরঃ.....

২. গত মাসে, প্রতি রাতে ঘুমিয়ে পড়তে সাধারণত কতক্ষন (মিনিটের মতো) সময় লেগেছে?

উত্তরঃ.....

৩. গত মাসে, আপনি সাধারণত সকালে কয়টার সময়ে ঘুম থেকে উঠেছিলেন?

উত্তরঃ.....

৪. গত মাসে, আপনি রাতে কত ঘন্টা সময় যাবত প্রকৃত ঘুমিয়েছিলেন?

উত্তরঃ.....

(এটি এর থেকে ভিন্ন হতে পারে আপনি বিছানায় কাটানো ঘন্টার সংখ্যা)

৫ থেকে ৮ নং প্রশ্নের উত্তর গুলের জন্য খালি ঘরে টিক (√) চিহ্ন দিন:

৫. গত মাসে আপনি কতবার ঘুমের সমস্যার সম্মুখীন হয়েছেন **(A থেকে J নম্বরের উত্তর দিন)**	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
A) ৩০ মিনিটের মধ্যে ঘুমাতে পারেননি	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
B) মধ্য রাতে বা খুব সকালে ঘুম থেকে উঠেছেন	গত মাসে	সপ্তাহে একবার এর	এক অথবা	তিন বা তার

	সমস্য হয়নি	কম	দুইবার	অধিক সময়
C) বাথরুম ব্যবহার করতে উঠতে হয়েছে	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
D) আরামে শ্বাস নিতে পারেননি	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
E) কাশি বা জোরে নাক ডাকা	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
F) বেশি ঠান্ডা অনুভব হয়েছে	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
G) বেশি গরম অনুভব হয়েছে	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
H) দুঃস্বপ্ন দেখেছেন	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
I)পেইন ছিলো	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
J) অন্যান্য যেমন: পরিক্ষা, কোর্সওয়ার্ক	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
প্রশ্ন				
৬. গত মাসে, আপনি কতবার ঔষধ গ্রহন করেছেন যা আপনাকে ঘুমাতে সাহয্য করেছে (প্রেসক্রিপশন বা নিজের মতো ঔষধ খেয়েছেন)?	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
৭. গত মাসে, আপনি কতবার ঘুমের সমস্যা সম্মুখীন হয়েছেন যেমন গাড়ি চালানো, খাবার খাওয়ার সময় জেগে থাকতে সমস্যা বা সামাজিক কার্যকলাপে জড়িত থাকতে?	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
৮. গত মাসে কাজ করার জন্য যথেষ্ট উৎসাহ বজায় রাখতে আপনার জন্য কতটা সমস্যা হয়েছে?	গত মাসে সমস্য হয়নি	সপ্তাহে একবার এর কম	এক অথবা দুইবার	তিন বা তার অধিক সময়
৯. গত মাসে আপনার ঘুমের রেটিং কেমন?	খুব ভালো	ভালো	খুব খারাপ	খারাপ

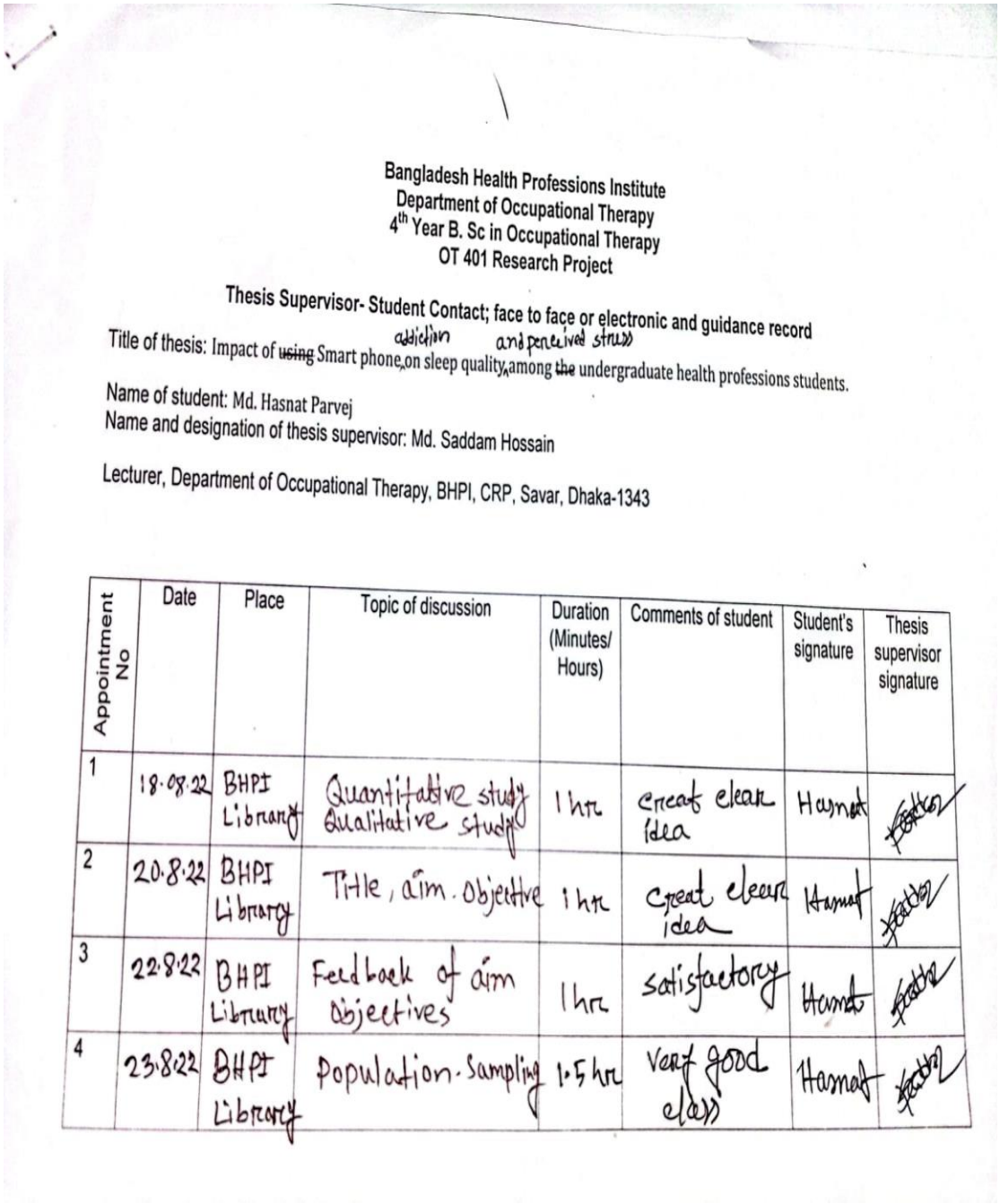
পারসিভড স্ট্রেচ স্কেলঃ (Percieved Stress scale)

প্রতিটি প্রশ্নের জন্য নিম্নলিখিত বিকল্পগুলি থেকে বিছে নিন:

গোল বৃত্ত (০) অথবা টিক $(\surd)$ চিহ্ন দিন যে অপশনটা আপনার সাথে মিলে যাই:

প্রশ্ন	০ = কখনোই না	১ = প্রায়ই না	২ = প্রায় সময়	৩ = মাঝে মধ্যেই	৪ = প্রায সবসময়
১. গত মাসে, অপ্রত্যাশিতভাবে ঘটে যাওয়া কিছুর কারণে আপনি কতবার মন খারাপ করেছেন?	০	১	২	৩	৪
২. গত মাসে আপনি কতবার অনুভব করেছেন যে আপনি আপনার জীবনের গুরুত্বপূর্ণ বিষয়গুলি নিয়ন্ত্রণে অক্ষম ছিলেন?	০	১	২	৩	৪
৩. গত মাসে, আপনি কতবার ভয় এবং চাপ অনুভব করেছেন?	০	১	২	৩	৪
৪. গত মাসে, আপনার ব্যক্তিগত সমস্যাগুলি পরিচালনা করার ক্ষমতা সম্পর্কে আপনি কতবার আত্মবিশ্বাসী বোধ করেছেন?	০	১	২	৩	৪
৫. গত মাসে, আপনি কতব্ার অনূভব করেছেন যে জিনিসগুলি আপনার পথে চলছে?	০	১	২	৩	৪
৬. গত মাসে, আপনি কতবার দেখেছেন যে আপনি মানিয়ে নিতে পারেননি? যে সম জিনিস আপনি করতেছিলেন?	০	১	২	৩	৪
৭. গত মাসে, আপনি কতবার আপনার জীবনে বিরক্তি নিয়ন্ত্রন করতে সক্ষম হয়েছেন?	০	১	২	৩	৪
৮. গত মাসে, আপনি কতবার অনুভব বরেছেন যে আপনি চাপ নিয়ন্ত্রণের শীর্ষে ছিলেন?	০	১	২	৩	৪
৯. গত মাসে, আপনার নিয়ন্ত্রণের বাইরের ঘটনাগুলির কারণে আপনি কতববার রাগান্বিত হয়েছেন?	০	১	২	৩	৪
১০. গত মাসে, আপনি কতবার অনুভব করেছেন যে অসুবিধুগুলি এত বেশি বেড়েছে যে আপনি সেগুলি কাটিয়ে উঠতে পারেননি?	০	১	২	৩	৪

Appendix E: Supervision Record Sheet



Bangladesh Health Professions Institute
Department of Occupational Therapy
4th Year B. Sc in Occupational Therapy
OT 401 Research Project

Thesis Supervisor- Student Contact; face to face or electronic and guidance record

Title of thesis: Impact of ~~using~~ Smart phone addiction on sleep quality and perceived stress among ~~the~~ undergraduate health professions students.

Name of student: Md. Hasnat Parvej
Name and designation of thesis supervisor: Md. Saddam Hossain

Lecturer, Department of Occupational Therapy, BHPI, CRP, Savar, Dhaka-1343

Appointment No	Date	Place	Topic of discussion	Duration (Minutes/ Hours)	Comments of student	Student's signature	Thesis supervisor signature
1	18.08.22	BHPI Library	Quantitative study Qualitative study	1 hr	Great clear idea	Hasnat	
2	20.8.22	BHPI Library	Title, aim. objective	1 hr	Great, clear idea	Hasnat	
3	22.8.22	BHPI Library	Feedback of aim objectives	1 hr	satisfactory	Hasnat	
4	23.8.22	BHPI Library	Population. Sampling	1.5 hr	Very good class	Hasnat	

5	24.8.22	BHPI Library	Confidence Interval	1.5 hr	Effective	Hasmat	
6	25.8.22	BHPI Library	Sampling size calculation Population	1 hr	Informative	Hasmat	
7	27.8.22	BHPI Library	Methods, Inclusion criterion	1.5 hr	very good	Hasmat	
8	28.8.22	BHPI outdoor	Background, significan of the study	1 hr	Effective	Hasmat	
9	29.8.22	BHPI Library	Literature review, Proposal feedback Analysis,	1 hr	satisfactory	Hasmat	
10	26.12.22	BHPI outdoor	Result	3 hr	very good	Hasmat	
11	4.1.23	OT depart (Set) Unit	Result	3 hr	Satisfactory	Hasmat	
12	9.1.23	OT depart (Set) Unit	Type of study, skewness kurtosis, p value	1 hr	Informative	Hasmat	
13	11.1.23	OT depart (Set) Unit	Discussion, conclusion	1.5 hr	very good	Hasmat	
14	14.1.23	BHPI Library	1st draft check	1 hr	Informative	Hasmat	
15	8.2.23	BHPI Library	Methodology Result	1 hr	satisfactory	Hasmat	
16	15.2.23	BHPI Library	Data analysis final	3 hr	Informative	Hasmat	
17	19.2.23	BHPI Library	result, conclusion	3 hr	very good	Hasmat	
18	2.2.23	BHPI Library	1st draft final feedback	1 hr	satisfactory	Hasmat	
19	11.5.23	BHPI Library	final submission	1 hr	very good	Hasmat	
20							

Note:

1. Appointment number will cover at least a total of 40 hours; applicable only for face-to-face contact with the supervisors.
2. Students will require submitting this completed record during submission your final thesis.