

# Assessment of the Excessive Rehearses of Smartphones Affected Symptoms on Sound Health of University Students in Bangladesh

Md. Nazmul Huda<sup>1,\*</sup>, Md. Abdus Sabur<sup>2</sup>, Md. Mizanoor Rahman<sup>2</sup>,  
Md. Abu Sina<sup>2</sup>, and Md. Ruhul Amin<sup>2</sup>

## ABSTRACT

The usage of smartphone is increasing rapidly, and it is treated as a symbol of status among the young generation, especially university students. The study is conducted to determine symptoms of excessive use of smartphones on university students' sound health. Among 350 students of Accounting and Information Systems (AIS), 289 voluntarily responded to answer the close-ended questionnaire with a five-point Likert Scale. To test and analyze the collected data, Cronbach's Alpha, mean, standard deviation, coefficient of variation, correlation analysis, factor analysis, and regression analysis are applied with the help of SPSS v25. The eye problem, physically uncomfortable, decreased academic performance, headaches, frustration, abstaining from indoor/outdoor games, physical exercise, and woes in family bonding have a significant correlation with the health conditions of the students and a significant impact on the dependent variable indicating abstaining from gaming, headache, and frustration are liable for overall uneasy feelings. Proper authorities should formulate effective policies to engage the students in different types of indoor and outdoor games, extra-curricular activities like debating, cultural programs (such as singing, playing, and dancing), quiz competitions, science fairs, and job fairs for improving mental health as well as physical activities.

Submitted: October 04, 2023

Published: December 08, 2023

 10.24018/ejsocial.2023.3.6.505

<sup>1</sup>Assistant Professor, Department of Accounting and Information Systems, Islamic University, Bangladesh.

<sup>2</sup>Professor, Department of Accounting and Information Systems, Islamic University, Bangladesh.

\*Corresponding Author:  
e-mail: nazmuliu07@gmail.com

**Keywords:** Feelings, Frustration, Smartphone, Sound health.

## 1. INTRODUCTION

The smartphone has replaced the phone as the most cost-effective means of communication internationally. Smartphone usage is increasing dramatically. From Bangladesh's perspective, up to June 2023, the total number of mobile users was 186.10, whereas the number of mobile users was 93.79 million in June 2012 (BTRC, 2023b). Internet users are also increasing significantly in Bangladesh. In June 2022, the number of users was 126.21 million; it increased to 129.40 million in June 2023 (BTRC, 2023a). In the past, text messages just used for phone calls were limited to caller and recipient. However, mobile technology advanced swiftly when customer requirements shifted to serve diversified purposes. The smartphone emerged, covering a wide range of services (communications devices, microphones, audio recorders, digital cameras, web browsers, a compass, weather forecasters, satellite navigation systems, and note-taking devices) that could be obtained by just clicking or touching the phone's screen of a smartphone. Now, smartphones are desirable products for the young generation (Khatun *et al.*, 2017; Mubassira & Das, 2019) and are used as a symbol of status (Vasudev *et al.*, 2012).

Smartphones can also help learners comprehend different things through the use of web browsers or other connected internet apps. However, since the internet and computer technology development, students are now learning by gathering data via electronic systems instead of books and lesson notes, which were used earlier as primary sources of knowledge (Mubassira & Das, 2019). The internet is beneficial for various reasons, including effortless electronic commerce, quick data sharing, touch with other societies, emotional support, gaming, and recreation (Cha & Seo, 2018). During the COVID-19 period, online shopping, educational institutions are provided distance learning via online



classes using Zoom, Google Meet, or YouTube videos, which is the desire of the government in Bangladesh (Islam et al., 2021). So, all levels of students (primary, secondary, college, and university) are supposed to purchase smartphones and take internet facilities for conducting classes, examinations, or other communications. As a result, a smartphone with the internet is available for all students in Bangladesh.

Despite the advantages it brings to use, however, it may sometimes hurt our regular lives. The unnecessary usage of smartphones negatively affects students' academic learning (Gerosa et al., 2022; Mubassira & Das, 2019; Rahman et al., 2022; Sunday et al., 2021). It affects health hazards like sleeping problems, reduced physical fitness, the habit of eating unhealthy foods, pain, migraines, depression, anxiety, drug addiction, addiction to social networking, and so on. (Kheirinejad et al., 2023; Kumar et al., 2011; Mengistu et al., 2023; Rathakrishnan et al., 2021; Shaheen et al., 2015; Tyagi et al., 2021; Vasudev et al., 2012; Wacks & Weinstein, 2021; Wang et al., 2019; Wattanaudomchai et al., 2023), and influences addictive behavior (Billieux et al., 2015; Servidio et al., 2022; Wattanaudomchai et al., 2023) decreasing face to face conversation with relatives and result increasing loneliness (Kim, 2017; Shaheen et al., 2015). Different types of diseases like heart diseases, effects on the fetus, alzheimer's disease, Parkinson's disease, brain tumor, male infertility, and ear impairment, digital eye strain were caused by excessive use of mobile phones (Chowdhury et al., 2019; Mohan et al., 2021; Suhag et al., 2016; Tyagi et al., 2021). Problematic smartphone users have a higher level of depression and anxiety compared with non-problematic smartphone users (Eichenberg et al., 2020; Wattanaudomchai et al., 2023). Urban residence is one of the factors for using problematic smartphones (Mengistu et al., 2023) and hampered sound health (Turgeman et al., 2020).

Students' sound health is negatively impacted by excessive smartphone use. Students with uneasy health and lack of concentration (Sarkar et al., 2019) do poorly in academic tasks, and their thinking power, problem-solving capacity, and decision-making ability decrease day by day. Depression, suicidal tendencies, and social distance are increasing (WHO, 2023). If excessive usage of smartphones among students continues, the country will face the burden of an unskilled workforce. So, it is an emerging issue to determine the adverse health effects of problematic smartphones, and awareness should be increased among the students and the parents. This study aims to determine the reasons for and consequences of excessive smartphone use on university students' health and offer recommendations to lessen the adverse effects on health. To develop ideas, clarify the different issues, and find out the hiatus of the undertaken study, the following pieces of literature have been reviewed.

## 2. LITERATURE REVIEW

The usage statuses of mobile of male science students (Class 10<sup>th</sup> to 12<sup>th</sup>) in the educational institutions of Kanpur, India, have been the focus of research studies. Researchers stated the factors motivating the supply of mobile phones to students. They found out the risk associated with the frequent usage and change of fashion and style made mental disorders. The result depicted that mobile is the symbol of status. Parents gave devices as birthday gifts, and schools' environments and heavy advertisements were liable for choosing mobile phones for the young generation (Vasudev et al., 2012). Three predictive factors, viz. smartphone, social networking, and gaming, were liable for the excessive use of smartphones in Korea (Cha & Seo, 2018). The effects of smartphone addiction had an impact on the learning and overall performance of the students were described (Sunday et al., 2021). Students were engaged in the use of smartphones for gaming at the school level. During the COVID-19 pandemic, students used smartphones for online classes, and their usage time of digital devices was more than 5 hours a day. Students also engaged in gaming for more than one hour a day, resulting in digital eye strain (Mohan et al., 2021). Six factors, i.e., physical activity, nutrition, stress management, health responsibility, interpersonal support, and self-actualization, influencing the sound health-promoting behavior of the university students of Jordan, were described. The analysis revealed a health problem among the students, especially in physical activities and stress management, which is significantly different based on age, income, university type, and employment status (Shaheen et al., 2015).

The health effects of using smartphones among intermediate-level students in the Khulna region of Bangladesh was conducted, and it found that urban science students who come from high society use smartphones for more than one hour daily. Results indicated that sleep hamper had a significant relationship with smartphone usage, which created many problems like eye strain, headache, hearing problems, and depression (Chowdhury et al., 2019). Different health hazards like heart diseases, effects on the fetus, alzheimer's disease, Parkinson's disease, brain tumor, male infertility, and ear impairment of the doctors and staff in the city of Karachi were caused by the excessive usage of mobile phones (Suhag et al., 2016). A review study was conducted to describe the effects of excessive smartphones on health conditions, including both physical and mental health of adolescents and young adults. The researchers concluded that excessive use of smartphones is associated with depression, anxiety, drug

addiction, addiction to social networking, impulsivity, low self-esteem, sleeping problems, physical fitness, unhealthy food habits, pain and so on (Wacks & Weinstein, 2021). Problematic smartphone use (PSPU) and problematic social media use (PSMU) of the students of Bangladesh at the college and university levels during the COVID-19 period were explained. Researchers indicated that lower age, poor sleep, social media use, TV watching, depression, and anxiety were positively associated with PSPU and PSMU. Genders, living with family, urban residence, irregular physical exercise, poor engagement with studies, earning activities, marital status, lower income family, and drug addiction are positively linked with PSMU (Islam et al., 2021). A study to investigate the predictors of problematic smartphone use of the current students of Sigmund Freud University in Vienna was made. In this study, only 497 students (27%) responded to provide information, of which 75 students showed problematic smartphone use and were found neuroticism and extraversion were related positively to those users (Eichenberg et al., 2020). The research was conducted to find out the effects of sleeping using a smartphone before going to bed. The result of research stated that using a smartphone before bed significantly impairs the duration of sleep, wake time, average blood pressure, and HR fluctuation (Kheirinejad et al., 2023). Another study about mobile addiction, depression, and related factors in medical students near the age of 20 years in Thailand was analyzed by applying multiple regression. The findings revealed that addiction to smartphones, depression, and sleeping problems were 43%, 25%, and 11% respectively. A significant relationship of depression was found with smartphone addiction, poor sleep, and study-related problems whereas depression, drug addiction interpersonal deficits were significant factors for mobile addiction (Wattanaudomchai et al., 2023). A study about the frequent usage of smartphones and social media was conducted to find out the causes of psychological problems among university students in Ethiopia. Depression, drug addictions, and urban residences were the influencing factors of problematic smartphone usage and poor sleeping quality significantly associated (Mengistu et al., 2023).

According to the go-through literature, it is found that many researchers have made it from different angles, but none of a single work has researched related topics. So, researchers have chosen the topic. It is hoped that the study will fill the research gap and provide new knowledge to the existing body of knowledge.

### 2.1. Objectives of the Study

The study's main objective is to assess if excessive smartphone rehearses affect the sound health position of university students in Bangladesh. The specific objectives are as follows:

1. To identify smartphone-affected symptoms on the sound health of university students in Bangladesh,
2. To measure the degree of feelings of the students for the selected symptoms included in the study,
3. To extract the factors that harm the student's health soundness for the excessive rehearses of smartphones,
4. To provide suggestions to overcome unavailable situations.

### 2.2. Hypothesis of the Study

H<sub>0</sub>: There is no positive significant impact on overall uneasy feelings for each surrogated variable of the extracted factors under study.

## 3. METHODOLOGY OF THE STUDY

Islamic University has enrolled about 16,000 students with 36 departments under eight faculties (Islamic University, 2023). The department of AIS is one of the important departments under the Business Administration Faculty that has been chosen using a purposive sampling method. There are 350 students in the department, and 289 of them responded to the survey voluntarily, accounting for 83% of the total respondents. June 2022 was the data-gathering period. A closed-ended questionnaire with a five-point Likert scale (1 = strongly disagreed, 2 = disagreed, 3 = no comment, 4 = agreed, and 5 = strongly agreed) to gather data from the students as the scores of agreed levels for various selected issues. The data have been analyzed by tools and techniques of Cronbach's Alpha, mean, standard deviation (S.D), coefficient of variation (C.V.), correlation analysis, factor analysis, and regression analysis to find out the effective outputs of the study.

## 4. ANALYSIS AND FINDINGS

The internal reliability and consistency of the gathered data are tested using Cronbach's alpha. The value of Cronbach's Alpha 0.75 indicated that the consistency and reliability of the collected data are

TABLE I: MEASURES OF DESCRIPTIVE STATISTICS AND RELATIONSHIP

Items	Mean	S.D.	C.V.	Correlation
Physical uncomfortable ( $X_1$ )	4.27	0.91	21.36	0.31**
Headache ( $X_2$ )	4.18	0.86	20.67	0.34**
Eye problem ( $X_3$ )	4.45	0.76	17.13	0.36**
Frustration ( $X_4$ )	3.89	1.05	26.89	0.29**
Decreasing academic performance ( $X_5$ )	4.20	0.97	23.23	0.35**
Woes family bonding ( $X_6$ )	3.53	1.13	31.91	0.30**
Physical exercise ( $X_7$ )	3.58	1.16	32.38	0.32**
Abstain from indoor/outdoor games ( $X_8$ )	3.87	1.08	27.82	0.39**
Overall uneasy feelings ( $Y_1$ )	4.18	0.94	22.50	1
Cronbach's alpha (Reliability measure)				0.75

Note: \*\* Correlation is significant at the 0.01 level (2-tailed) with  $Y_1$  for each independent variable.

in a satisfactory position. The descriptive statistics and relationships of the selected items for the study during the review periods are shown in Table I. The mean value of all the variables was determined to be about 4 (agreed) in the respondents' judgments. The mean value of eye problems (4.45), physical uncomfortable (4.27), decreasing academic performance (4.20), headache (4.18), frustration (3.89), abstaining from indoor/outdoor games (3.87), physical exercise (3.58), woes family bonding (3.53) and the overall uneasy feelings ( $Y_1$ ) is also indicated agreed level. A smaller coefficient of variation (C. V.) value suggests higher consistency, whereas a higher value indicates less uniformity of the respondents' opinions. The value of the coefficient of variation of the selected items  $X_3$ ,  $X_2$ ,  $X_1$ ,  $X_5$ ,  $X_4$ ,  $X_8$ ,  $X_6$ , and  $X_7$  is 17.13%, 20.67%, 21.36%, 23.23%, 26.89%, 27.82%, 31.91%, and 32.38%, respectively. The overall uneasy feelings were 22.5%. The result indicated that respondents' (students) opinions about eye problems are more consistent, whereas physical exercise is less consistent. The overall mean perceptions of excess using smartphones significantly correlate with each of the 8 factors. There have been various recent attempts to pinpoint the smartphone effects on the health condition of university students, and the variables have been found to significantly influence a variety of features, as in the analyses below.

The KMO and Bartlett's Test represent the sampling adequacy of data. The result of the Kaiser-Mayer-Olkin (KMO) of sampling data adequacy is 0.77, which explains the accepted level of data, and the currently collected data is 77% correct at a 99% significance level.

Out of the nine characteristics that were initially considered, the study discovered seven quality variables, as shown in Table II. All nine variables were chosen based on the Eigenvalue, a value greater than 1, and statistically significant. These seven variables create three factors. The study focused on these three factors, resulting in total Eigenvalues of 2.21, 1.86, and 1.48 on Factor 1: Abstaining from physical activities, Factor 2: Physical feelings with uneasiness, and Factor 3: Mental feelings with frustration explained by 24.52, 20.61, and 16.43 respectively. For each extracted factor, the surrogated variables are selected as  $X_8$ ,  $X_2$ , and  $X_4$  from factors 1, 2, and 3 according to the highest loading values. The following analyses have been carried out to find out the impacts of these surrogated variables on overall uneasy feelings.

$H_0$ : There is no positive significant impact on overall uneasy feelings for each surrogated variable of the extracted factors under study.

TABLE II: IDENTIFIED FACTORS AND RELATED MEASURES

Items	Factors extracted		
	Factor 1	Factor 2	Factor 3
Abstain from indoor/outdoor games ( $X_8$ )	0.90		
Physical exercise ( $X_7$ )	0.79		
Woes family bonding ( $X_6$ )	0.65		
Headache ( $X_2$ )		0.84	
Eye problem ( $X_3$ )		0.83	
Frustration ( $X_4$ )			0.85
Physical uncomfortable ( $X_1$ )			0.59
KMO and Bartlett's test adequacy	0.77		
Approx. Chi-Square value	556.06**		
Total variances explained (%)	61.56		
% of Variances explained for Eigen value > 1	24.52 (2.21)	20.61 (1.86)	16.43 (1.48)

Source: Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization and Rotation converged in 5 iterations. \*\* Significant at 1% Level with a degree of freedom 36.

TABLE III: REGRESSION COEFFICIENTS AND ITS RELATED MEASURES

Surrogated variables	$\beta$	t-value	VIF
Abstain from indoor/outdoor games ( $X_8$ )	0.50	22.74**	1.06
Headache ( $X_2$ )	0.41	18.29**	1.10
Frustration ( $X_4$ )	0.47	21.41**	1.06
Related measures regarding model fit			
Model summary	R-squared: 0.871	Adjusted R-squared: 0.869	Std. error: 0.268
ANOVA	Regression: 138.43 (3)	Residual: 20.54 (285)	F-statistics: 640.39**

Notes: *Dependent variable: Overall uneasy feelings ( $Y_1$ ). \*\* Significant at 1% Level;  $\beta$  is treated as a standardized regression coefficient and within the first parenthesis indicates a degree of freedom.*

In Table III, the dependent variable is overall uneasy feelings, and the predictors are abstaining from the game ( $X_8$ ), headache ( $X_2$ ), and frustration ( $X_4$ ) for the undertaken study. The R-squared, adjusted R-squared, and standard error results are estimated as 0.871, 0.869, and 0.268, respectively, with a valid and significant ANOVA test. So, the model is fitted for the study.

These variables mentioned above are shown as significant contributions at a 1% level to the dependent variable by 0.50 ( $X_8$ ), 0.41 ( $X_2$ ), and 0.47 ( $X_4$ ). The variance inflationary factors (VIF) in the model are found to range from a minimum of 1.06 to a maximum of 1.10, indicating a level of acceptable multicollinearity. Each predictor's coefficient has a positive, distinctive, and significant impact on the dependent variable, indicating abstaining from gaming, headache, and frustration are liable for overall uneasy feelings. Thus, the null hypothesis is rejected based on available circumstances.

## 5. DISCUSSION

Significant findings based on the analysis are as follows:

1. The overall mean perceptions of excess using smartphones are significantly correlated with each of the 8 variables: physical discomfort, headache, eye problems, frustration, decreasing academic performance, woes, family bonding, physical exercise, and abstaining from indoor/outdoor games.
2. Factor 1 (Abstaining from physical activities), Factor 2 (Physical feelings with uneasiness), and Factor 3 (Mental feelings with frustration) factors are problematic for the excessive usage of mobile phones. It is crucial to remember that factor loading is the correlation between the primary variable of the problematic factor and the essential element in comprehending the characteristics of that particular factor.
3. Among the factors, abstaining from gaming, headache, and frustration impact the dependent variable significantly, indicating overall uneasy feelings.

## 6. CONCLUSION

All technologies are invented for the well-being of the people. However, the usefulness and effectiveness depend on the usage of mankind. Smartphones are high-tech communication devices and rapidly change their features with the customers' demands. It is noted that adverse health effects are significant with the excessive usage of smartphones among the students of Islamic University. The identified factors are classified under three groups: abstaining from activities, physical feelings of uneasiness, and mental feelings of frustration.

## 7. RECOMMENDATIONS

Based on the observation of the analysis and interpretations, the following suggestions and recommendations may be fruitful in reducing the adverse effects on health due to excessive use of smartphones:

1. Proper authorities should formulate effective policies to improve the current situation and reduce harmful effects.
2. Students should be engaged in different types of indoor and outdoor games, extra-curricular activities like debating, cultural programs (for example, singing, playing, dancing), quiz competitions, science fairs, job fairs for improving mental health, and physical activities.

3. Arrange different types of seminars, awareness programs, psychological counseling programs, and presentation competitions to focus on the adverse effects on the health of the excessive use of smartphones.
4. Individual awareness should be built to keep smartphones in a distant place to protect from ultrasounds that cause headaches and brain tumors.
5. Family bonding among the family members should be developed, and social gathering functions should be introduced.
6. Smartphone should be kept at a distance places from the bed at the time of charging and keep silent mode/airplane mode to ensure sound sleeping.

## 8. LIMITATIONS OF RESEARCH

Overall, negative symptoms of using smartphones were the considered factors in the study without considering the individual segments' impact, like gender effects, age effects, marital status effects, family positions, and residential status. Moreover, the study covers only those symptoms regarding excessive smartphones that harm students' physical and mental soundness.

## CONFLICTS OF INTEREST

The authors declare that there was no conflict of interest.

## REFERENCES

- Billieux, J., Maurage, P., Lopez-Fernandez, O., Kuss, D. J., & Griffiths, M. D. (2015). Can disordered mobile phone use be considered a behavioral addiction? An update on current evidence and a comprehensive model for future research. *Current Addiction Reports*, 2(2), 156–162.
- BTRC (2023a). *License and statistics-internet subscribers*. Bangladesh telecommunication regulatory commission. <http://www.btrc.gov.bd/site/page/347df7fe-409f-451e-a415-65b109a207f5/-#>.
- BTRC, (2023b). *License and statistics-mobile subscribers*. Bangladesh telecommunication regulatory commission. <http://www.btrc.gov.bd/site/page/0ae188ae-146e-465c-8ed8-d76b7947b5dd/->.
- Cha, S. S., & Seo, B. K. (2018). Smartphone use and smartphone addiction in middle school students in Korea: Prevalence, social networking service, and game use. *Health Psychology Open*, 5(1), 2055102918755046. <https://doi.org/10.1177/2055102918755046>.
- Chowdhury, S., Basu, B., & Laskar, M. (2019). Impact of smartphone use on health among higher secondary level students in Khulna. *Bangladesh Mediscope*, 6(1), 1–5.
- Eichenberg, C., Schott, M., & Schroiff, A. (2020). Problematic smartphone use-comparison of students with and without problematic smartphone use in light of personality. *Front Psychiatry*, 11, 599241. <https://doi.org/10.3389/fpsy.2020.599241>.
- Gerosa, T., Gui, M., & Büchi, M. (2022). Smartphone use and academic performance: A pervasiveness approach beyond addiction. *Social Science Computer Review*, 40(6), 1542–1561.
- Islam, M. S., Sujan, M. S. H., Tasnim, R., Mohona, R. A., Ferdous, M. Z., Kamruzzaman, S. et al., (2021). Problematic smartphone and social media use among Bangladeshi college and university students amid COVID-19: The role of psychological well-being and pandemic related factors. *Front Psychiatry*, 12, 1–12. <https://doi.org/10.3389/fpsy.2021.647386>.
- Islamic University, B (2023). *Diary 2023*. Dhaka: The Mudaronbid.
- Khatun, M. S., Rana, M. J., & Ali, M. J. (2017). Consumer's attitude towards the use of smartphone in Bangladesh: A circumstantial study on Rangpur region. *European Journal of Business and Management*, 9(1), 31–56.
- Kheirinejad, S., Visuri, A., Ferreira, D., & Hosio, S. (2023). Leave your smartphone out of bed: Quantitative analysis of smartphone use effect on sleep quality. *Personal and Ubiquitous Computing*, 27(2), 447–466.
- Kim, J.-H. (2017). *Longitudinal Associations among Psychological Issues and Problematic Use of Smartphones*. Journal of Media Psychology.
- Kumar, L. R., Chii, K. D., Way, L. C., Jetly, Y., & Rajendaran, V. (2011). Awareness of mobile phone hazards among university students in a Malaysian medical school. *Health*, 3(7), 406.
- Mengistu, N., Habtamu, E., Kassaw, C., Madoro, D., Molla, W., Wudneh, A. et al., (2023). Problematic smartphone and social media use among undergraduate students during the COVID-19 pandemic: In the case of southern Ethiopia universities. *PloS One*, 18(1), e0280724.
- Mohan, A., Sen, P., Shah, C., Jain, E., & Jain, S. (2021). Prevalence and risk factor assessment of digital eye strain among children using online e-learning during the COVID-19 pandemic: Digital eye strain among kids (DESK study-1). *Indian Journal of Ophthalmology*, 69(1), 140.
- Mubassira, M., & Das, A. K. (2019). The impact of university students' smartphone use and academic performance in Bangladesh: A quantitative study. In *Proceedings of the 13th International Conference on Ubiquitous Information Management and Communication (IMCOM) 2019*, 13 (pp. 734–748). Cham: Springer International Publishing.
- Rahman, T., Rahman, M. M., Sabur, M. A., & Huda, M. N. (2022). Identified factors of the effects of excessive usages of smartphone on health of the university students: A study on Islamic university, Kushtia. *Bangladesh Archives of Business Research*, 10(9), 102–111.
- Rathakrishnan, B., Bikar Singh, S. S., Kamaluddin, M. R., Yahaya, A., Mohd Nasir, M. A., Ibrahim, F. (2021). Smartphone addiction and sleep quality on academic performance of university students: An exploratory research. *International Journal of Environmental Research and Public Health*, 18(16), 8291.
- Sarkar, T. K., Taneja, N., Jana, P. K., Gupta, S., Dalal, R., Dasgupta, R. (2019). Effect of mobile phone overuse on health of medical students. *International Journal of Medical Science and Public Health*, 8(1), 91–94.
- Servidio, R., Koronczi, B., Griffiths, M. D., & Demetrovics, Z. (2022). Problematic smartphone use and problematic social media use: The predictive role of self-construal and the mediating effect of fear missing out. *Frontiers in Public Health*, 10, 814468.

- Shaheen, A. M., Nassar, O. S., Amre, H. M., & Hamdan-Mansour, A. M. (2015). Factors affecting health-promoting behaviors of university students in Jordan. *Health, 7*(1), 1.
- Suhag, A. K., Larik, R. S., Mangi, G. Z., Khan, M., Abbasi, S., & Madiha, H. (2016). Impact of excessive mobile phone usage on human. *Journal of Computer Science & Systems Biology, 9*, 173–177.
- Sunday, O. J., Adesope, O. O., & Maarhuis, P. L. (2021). The effects of smartphone addiction on learning: A meta-analysis. *Computers in Human Behavior Reports, 4*, 100114.
- Turgeman, L., Hefner, I., Bazon, M., Yehoshua, O., & Weinstein, A. (2020). Studies on the relationship between social anxiety and excessive smartphone use and on the effects of abstinence and sensation seeking on excessive smartphone use. *International Journal of Environmental Research and Public Health, 17*(4), 1262.
- Tyagi, A., Prasad, A. K., & Bhatia, D. (2021). Effects of excessive use of mobile phone technology in India on human health during COVID-19 lockdown. *Technology in Society, 67*, 1–7. <https://doi.org/10.1016/j.techsoc.2021.101762>.
- Vasudev, A., Kaur, M., Kumar, H., & Chaturvedi, R. (2012). Mobile phone usage and awareness of health related issues among the male science students. *Studies in Sociology of Science, 3*(3), 62.
- Wacks, Y., & Weinstein, A. M. (2021). Excessive smartphone use is associated with health problems in adolescents and young adults. *Frontiers in Psychiatry, 12*(669042), 1–7. <https://doi.org/10.3389/fpsy.2021.669042>.
- Wang, P. -Y., Chen, K. -L., Yang, S. -Y., & Lin, P. -H. (2019). Relationship of sleep quality, smartphone dependence, and health-related behaviors in female junior college students. *PloS One, 14*(4), e0214769.
- Wattanaudomchai, A., Tangwongchai, S., & Lalitanantpong, D. (2023). Depression, smartphone addiction, and association factors among preclinical medical students. *Chulalongkorn Medical Journal, 67*(2), 113–122.
- WHO (March 31, 2023). Depressive disorder (depression). <https://www.who.int/news-room/fact-sheets/detail/depression>.