



PREVALENCE OF SMARTPHONE DEPENDENCY AMONG KABUL UNIVERSITY OF MEDICAL SCIENCES STUDENTS

Sifatullah Asadi, Mohammad Baryalai Barya, Wafa Mohammad Halimi

Abstract

Background: Smartphone dependency is a global problem that is increasing rapidly every year. This study aims to investigate the prevalence of smartphone dependency among medical students of KUMS and to determine which groups have the highest Prevalence according to their academic year (class) and professional department (faculty).

Methods: In this descriptive cross-sectional study, a total of 310 students were included in the fall semester of 1402 at Kabul University of Medical Sciences. The questionnaire had two parts. The first part gathered information about demographic characteristics and some other variables, such as having regular exercise, sleep problems, the number of smartphones, daily use of smartphones, and other variables that were thought to be related to the possible results of the research. The second part of the questionnaire had 10 questions with a six-point Likert scale and collected information about smartphone dependency.

Result: This study shows that smartphone dependency is a common problem among students; more than half of students (52.11%) are dependent on smartphones. Among the faculties, 69.09% of students in public health and the grades (61.9%) of students in the 3rd class were recognized as the groups with the highest prevalence of smartphone addiction. Almost all participants (99.65%) had a smartphone, except one person.

Keywords: smartphone, medical students, dependency, prevalence, SAS-SV

Introduction

Adolescence is one of the most important periods of a person's life because many beliefs and habits are formed during these years. We are well aware that efforts must be made to improve health very early and before the arising of unhealthy beliefs and habits, because changing a habit is one of the few failures for which science does not have a fully successful and easy plan. Personal change and transformation in this important period are considered very important in physical and psychological aspects.

In the absence of necessary facilities, such as not having a guide, good friends, and official engagement, a youngster may go towards social decline. In order to get out of this loneliness, they may try alternative ways such as watching movies or using the internet and online games. Unfortunately, other problems have reached such a level that it doesn't need to be explained. Regarding smartphone dependency, in my opinion, this is one of the problems that may challenge the entire population of the world. And I think that we can use the word "pandemic". If you go to research sites, you will come across a large number of articles in different countries about smartphone dependency, but what makes this article more distinctive is the location and population.

The population of our country (Afghanistan), especially school and university students, may not be as rich as Europe, America, or the Arab world, and may not have as many expensive smartphones as the others have, but what they have, they will use more due to the increase in free

time. Among the whole population of the country, medical university students may use more smartphones because of daily lesson repetition and checking references, or even following online medical series like Dr. Najib, etc. That's why I want to find the prevalence of smartphone dependency among KUMS (Kabul University of Medical Sciences) students in 1402. And I want to investigate the severity of the problem closely.

Materials and methods

In this study, a descriptive cross-sectional method has been used to find the prevalence of smartphone dependency among students of the Kabul University of Medical Sciences. This research was conducted in the fall semester of 1402 from the "7 Asad 1402 to the 25 Aqrab 1402", which is equal to "29 July 2023 to 14 November 2023". Study population: This study includes all active students of the fall semester of 1402 of Kabul University of Medical Sciences, excluding interns, as the general population.

Sampling Method

In this research, quota sampling was used. Quota sampling is similar to stratified sampling, but after giving a portion to all the subgroups, the participants within each subgroup are selected in a non-random way. So, first, from the total population of 1591 students, a sample size of 309 students was determined using the Epi Info application.

Table 3.1: Total numbers of all available students by class and faculty.

Faculty	1 st Class	2 nd Class	3 rd Class	4 th Class	5 th Class	Total
Medicine	124	109	93	112	91	529
Stomatology	90	87	57	56	50	340
Public Health	89	68	74	61	0	292
Nursing	53	43	25	19	0	140
Health Supplement	100	73	73	44	0	290
Total	456	380	322	292	141	1591

Table 3.2: Total Number of distributed questionnaires by class and faculty

Faculty	1 st Class	2 nd Class	3 rd Class	4 th Class	5 th Class	Total
Medicine	24	21	18	22	18	103
Stomatology	17	17	11	11	10	66
Public Health	17	13	15	12	0	57
Nursing	10	8	5	4	0	27
Health Supplement	19	14	14	9	0	56
Total	87	73	63	58	28	309

Sample Size

From the total population of 1591 students of Kabul University of Medical Sciences, A sample size of 309 students was determined, and the specifications of the applied formula are as follows:

- Population Size = 1,591
- Confidence level = 95%
- Expected Frequency = 50%
- Confidence Limits = 5%
- Sample Size = 309

Data Source and Measurement Methods

In this research, a short version of the Smartphone Addiction Scale SAS-SV was used¹⁹. This scale calculates all 10 questions' answers and then decides whether the participant is dependent on a smartphone or not. And then added some demographic information questions related to the subject, adapted from validated research instruments, after consultation with my academic advisor.¹²

What I did to avoid possible errors (Bias)

Eliminating all biases from research is an ideal theory, but efforts should be made to reduce possible errors to their smallest limit. Some bias reduction measures are as follows:

- Valid questionnaires and demographic information: In this section, A validated questionnaire was selected, which had the highest scores for Cronbach's alpha ($\alpha = 0.91$).
- Demographic information: This information was selected to produce the most reliable and best results.
- Sampling method: To avoid errors in selection (Selection Bias), quota sampling was used.
- Excluded cases from the research whose information was not completed.

Statistical Methods: To find smartphone dependency, I used the SAS-SV questionnaire. This questionnaire has 10 questions with a six-point Likert scale. (1= Strongly disagree, 2 = Disagree, 3 = Weakly disagree, 4 = Weakly agree, 5 = Agree, 6 = Strongly agree) All 10 answers are taken to calculate the sum of scores. Based on all previous studies, if the sum of all 10 answers is more than 30, it is considered to be dependent on the smartphone. Moreover, Data were analyzed using Microsoft Excel and SPSS version 26.

Missing Data

According to the statistical rules, when more than half of the data is not available in a case, the entire case will be deleted, and if more than half of the data is not available in a variable, the entire variable will be deleted. If any case or variable has a small number of missing values, there are two solutions: Step 1: checking for missed information in a questionnaire, because it may not be entered correctly. Step 2: If we have a phone number, email, or any other possible way to communicate with the participant, it's better to ask him/her directly. Step 3: If there is no possible path, or it's too expensive/time-consuming to know the original data, then we can use these methods.

1. Removing: case or variables which has more than half of missing data.

2. Imputation: replacing with the nearest value.

The first way is obvious: to delete the variable or observation whose data is not complete. In qualitative variables (Nominal/Ordinal), we calculate the statistical mode of that variable, and later, we replace the empty cells with the mode of the same variable. In quantitative variables (scale), we replace the mean of the relevant variable.²⁰

Ethical Issues

The present research has been reviewed and approved by my academic advisor and the directorate of public health faculty and assessed for students' statistics (all formal letters are available if needed).

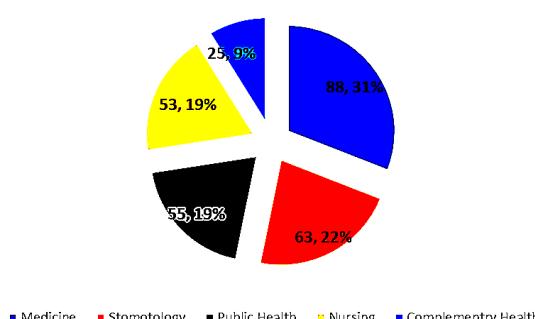
In the header part of each questionnaire, there was a clear consent for participants that their information is safe and just used only for academic purposes.

All participants' information is gathered anonymously.

Results

This research has included all the classes at the Kabul University of Medical Sciences. In this study, questionnaires were distributed to a total of 310 students; after removing the missing data, 284 valid questionnaires were used for further analysis. The variable of monthly income was completely deleted from further analysis. In my opinion, most students don't have any exact monthly income, so they may not answer this question.

Which faculty's student you are?



Which grade's student you are?

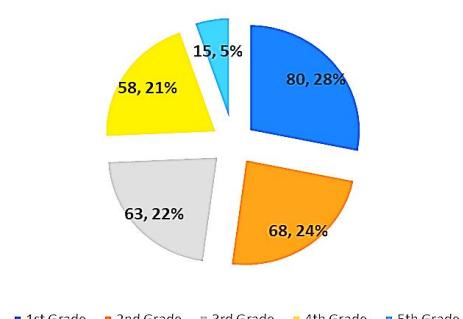
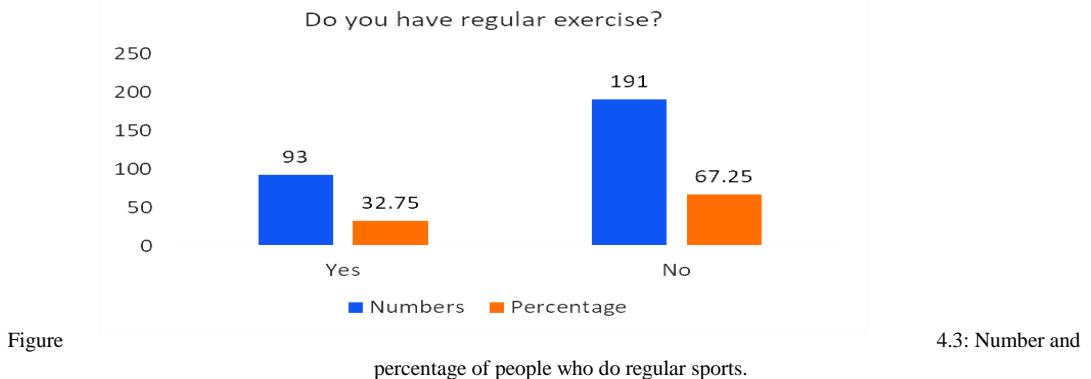


Figure 4.1: According to the statistics, ased on the field of study. The largest number is from the Faculty of Medicine, and the smallest number is from nursing.

Figure 4.2: Number and percentage of participants by class or academic year.



According to the statistics based on the academic year, the highest number is from the first class, and the lowest number is from the fifth class. By growing up in class or the academic year, the percentage of participants decreases. The majority (91.90%) of 261 people in this study are single. While the married are only 23 (8.10%) people. According to the statistics based on the academic year, the highest number is from the first class, and the lowest number is from

the fifth class. By growing up in class or the academic year, the percentage of participants decreases. The majority (91.90%) of 261 people in this study are single. While the married are only 23 (8.10%) people. After the marital status question, the next variable is regular exercise. In this section, there were (32.70%) 93 people who had regular exercise, and (67.30%) 191 people who did not have any regular schedule for exercise.

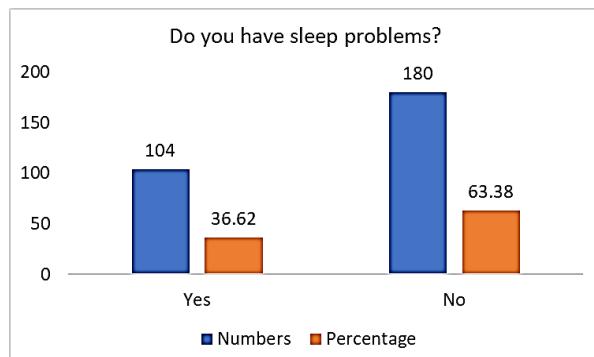
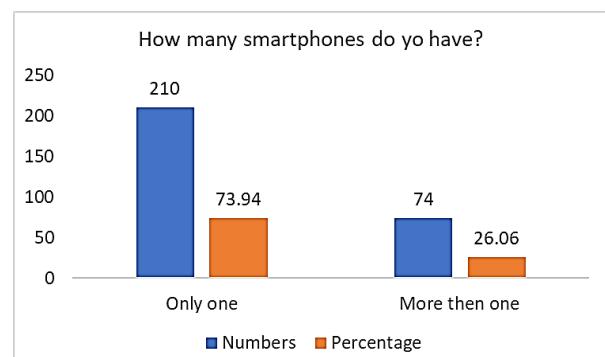


Figure 4.4: Number and percentage of people with sleep problems.

Among the participants of this study, (36.60%) 104 people had trouble sleeping, and (63.40%) 180 people were free of sleep problems. Fortunately, there are only nine people (3.20%) who lost one or both parents. And people who use cigarettes are fewer (4.20%), 12 people. In the above bar chart, we can see that the number of people who have



more than one smartphone is 26.06%, or 74 students, and the number of people who have one smartphone is 73.94%, or 210 students. Another important variable is the variable of daily smartphone use by hours. The chart above shows that 42.25% of 120 people use their smartphones for more than 3 hours. In contrast, there are (57.75%) 164 people who use less than 3 hours.

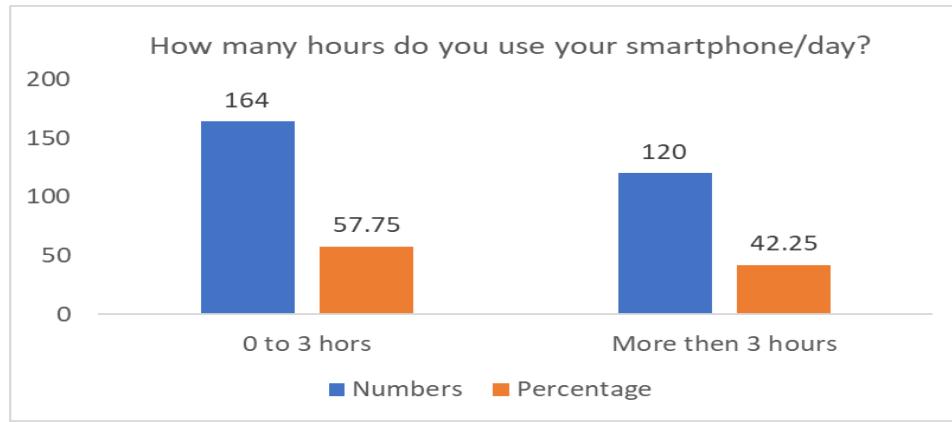


Figure 4.6: The number and percentage of people according to the daily use of the smartphone by the hour.

Table 4.1: Summary of the number and percentages of demographic information and variables.

Variable	Category	Number	Percentage
Faculty	Therapeutic Medicine	88	31.00
	Stomatology	63	22.23
	Public Health	55	19.44
	Nursing	25	8.80
	Health Supplement	53	18.74
Academic Year	First Class	80	28.26
	Second Class	68	23.91
	Third Class	64	22.23
	Fourth Class	58	20.45
	Fifth Class	15	5.30
Marital Status	Single	261	91.93
	Married	23	8.14

Table 4.2: Summary of numbers and statistics of smartphone usage patterns and some other variables.

Variable	Category	Number	Percentage
Exercise	No	191	67.30
	Yes	93	32.71
sleep problems	No	180	63.45
	Yes	104	36.60
Marital status of parents	widow/divorce	9	3.23
	Married	275	96.81
Cigarette Use	No	272	95.84
	Yes	12	4.27
Number of Smartphones	One	210	73.91

Daily use of smartphones by Hour	More than one	74	26.13
	From 0 to 3 hours	164	57.74
	More than 3 hours	120	42.37

Part two: Research results considering research questions and research objectives

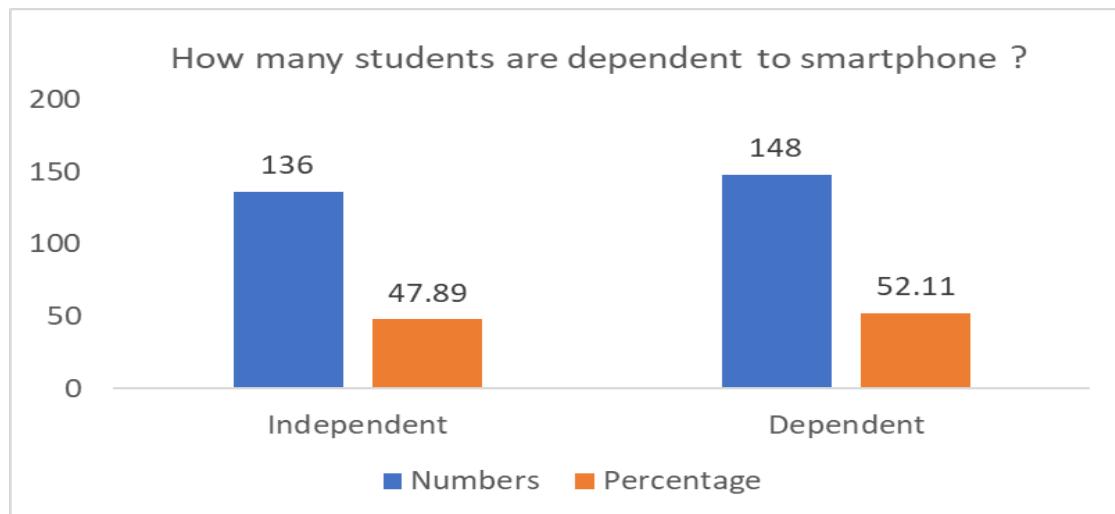


Figure 4.7: Number and percentage of people dependent on the smartphone.

The general Prevalence of smartphone addiction among students of Kabul University of Medical Sciences is more than half, and (52.11%) 148 people are addicted to phones.

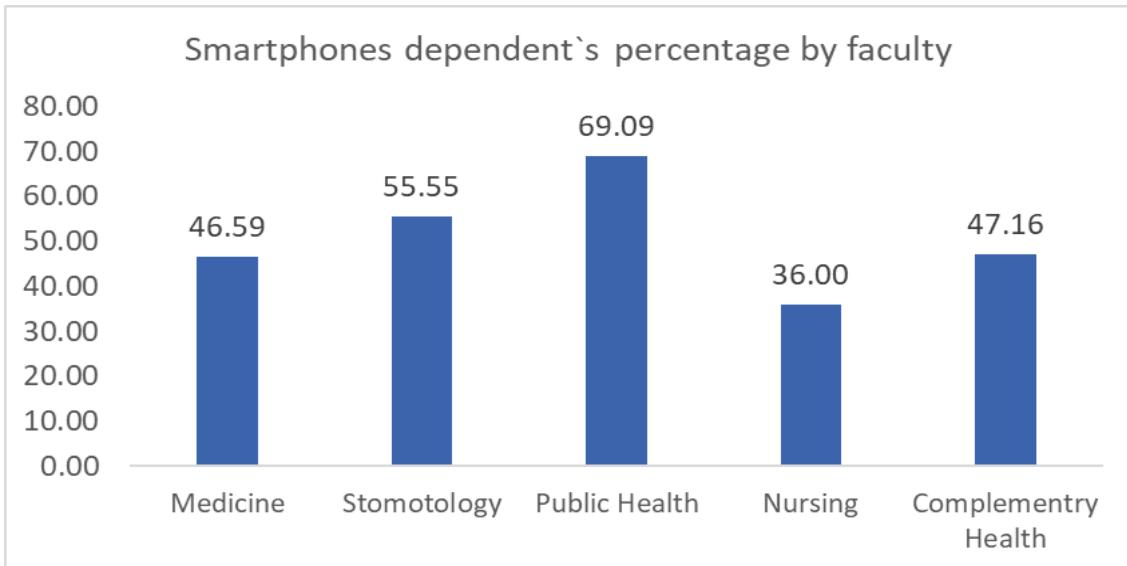


Figure 5.1: Percentages of smartphone-dependent participants in each faculty.

According to the field of study, (69.09%) of public health students, (55.55%) of stomatology students, (47.16%) of complementary health students, (46.59%) of medicine students, and (36%) of nursing students were recognized as smartphone dependents.

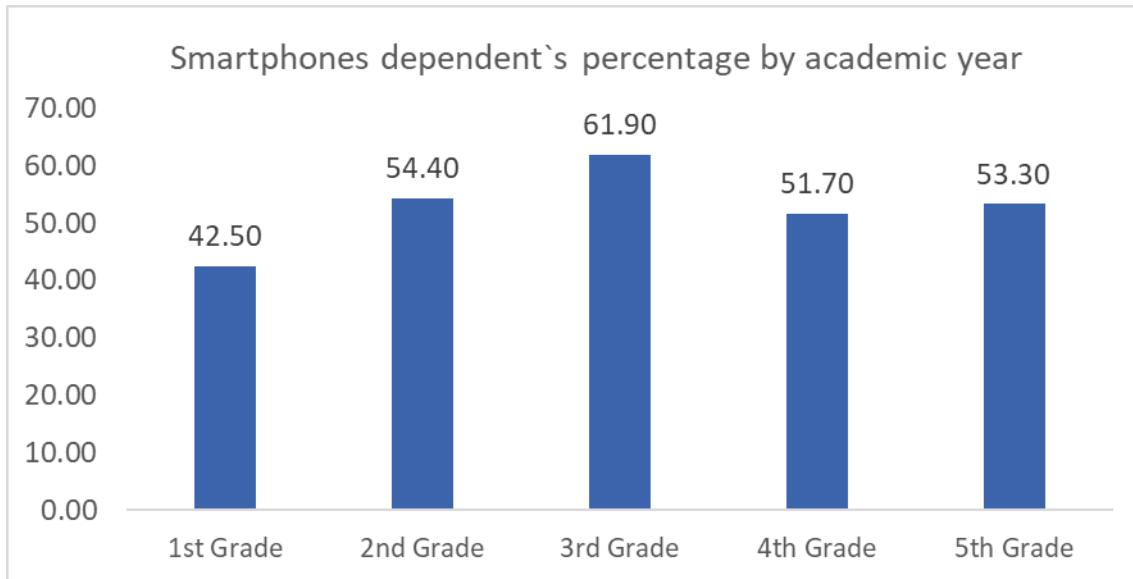


Figure 5.2: Percentages of smartphone-dependent participants in each class.

According to the academic year, the third class has won first place, with 61.90% of students dependent on smartphones. And the next (54.40%), (53.30%), (51.70%), and (42.50%) were from the second, fifth, fourth, and first classes, respectively.

The Prevalence of having at least one smartphone among students was at its highest level (99.65%). Part three: results of Smartphone Dependency. In this section, some information about the main part of the (SAS-SV) questionnaire is mentioned. The question with which most participants (197 students) disagreed (the set of strongly disagree, weakly disagree, and disagree) is the sixth question (I have a smartphone in my mind even when I am not using it), and the question with which most participants agreed (the set of strongly agree, weakly agree and agree) is the second question (Because of using my smartphone, I can't concentrate in class, while doing assignments or while working). For checking other answers, please see the table below.

Table 4.3: Number and percentage of students who agree/disagree with the main part of SAS-SV.

No	Variable	Answer	number	Percentage
1	Missing planned work due to smartphone use	Disagree	186	65.49
		Agree	98	34.51
2	Having a hard time concentrating in class, while doing assignments, or while working, due to smartphone use	Disagree	117	41.20
		Agree	167	58.80
3	Feeling pain in the wrists or at the back of the neck while using a smartphone	Disagree	180	63.38
		Agree	104	36.62
4	I won't be able to stand not having a smartphone	Disagree	124	43.66
		Agree	160	56.34
5	Feeling impatient and fretful when I am not holding my smartphone	Disagree	156	54.93
		Agree	128	45.07
6	Having my smartphone in my mind even when I am not using it	Disagree	197	69.37
		Agree	87	30.63
7	I will never give up using my smartphone, even when my daily life is already greatly affected by it	Disagree	201	70.77
		Agree	83	29.23
8	Constantly check my smartphone so as not to miss conversations between other people on Twitter or Facebook	Disagree	144	50.70
		Agree	140	49.30
9	Using my smartphone longer than I had intended	Disagree	125	44.01
		Agree	159	55.99
10	The people around me tell me that I use my smartphone too much	Disagree	177	62.32
		Agree	107	37.68

Information about (Missing Data)

A short explanation of missing data is as follows.

1. Missing data related to the case or observation. Some questionnaires, which did not have enough information, were excluded from the analysis. Only one questionnaire (the holder of serial number 19) was excluded from the analysis because it did not have a smartphone.
2. Missing data related to the variable. In this section, the only variable that was excluded from the analysis due to the large amount of missing data was the monthly income variable.

Table 4.4: Missing data table of demographic variables/first part of the questionnaire.

No	Variable	Valid	Missed	Mode
1	Marital state	272	13	Single
2	Monthly income	51	233	
3	Exercise	281	3	No
4	Sleep problems	283	1	No
5	Marital status of parents	276	8	Married
6	Cigarette use	282	2	No
7	Number of smartphones	282	2	one
8	Daily use of the smartphone by hour	282	2	0 to 3 hours

Table 4.5: Missing data table of dependency section/main part variables.

No	Variable	Valid	Missing	Mode
1	Missing planned work due to smartphone use	283	1	Agree

2	Having a hard time concentrating in class, while doing assignments, or while working, due to smartphone use	284	0	
3	Feeling pain in the wrists or at the back of the neck while using a smartphone	282	2	Strongly disagree
4	I won't be able to stand not having a smartphone	281	3	Agree
5	Feeling impatient and fretful when I am not holding my smartphone	281	3	Strongly disagree
6	Having my smartphone in my mind even when I am not using it	278	6	Opposite
7	I will never give up using my smartphone, even when my daily life is already greatly affected by it	282	2	Strongly disagree
8	Constantly check my smartphone so as not to miss conversations between other people on Twitter or Facebook	282	2	agree
9	Using my smartphone longer than I had intended	281	3	agree
10	The people around me tell me that I use my smartphone too much.	284	0	

In general, 148 students (52.11%) of participants depended on their smartphone.

Table 4.6: Smartphone dependency statistics by faculty.

Faculty	Percentage	Number
Medicine	46.59%	41
Stomatology	55.55%	35
Public Health	69.09%	38
Nursing	36.00%	9
health supplementary	47.16%	25

Table 4.7: Smartphone dependency statistics by faculty

Class	Percentage	Numbers
First Class	42.50%	34
Second Class	54.40%	37
Third Class	61.90%	39
Forth Class	51.70%	30
Fifth Class	53.30%	8

Moreover, there was only one person (0.3%) who did not have a smartphone.

Discussion

In this section, the findings of the research are compared with the research of other countries in the world. The results of different research in different countries are different for different reasons. For a better comparison, I would like to briefly mention the results of this research. And later, I will bring some research that was completed in different countries in different years. Later, I will compare the results of each research with my research and finally have a general result. The current research was conducted at Kabul University of Medical Sciences in 1402. In this research, questionnaires were distributed to 310 students, and after removing invalid questionnaires, 284 valid questionnaires were included in the research. In this research, there were 283 students who had at least one smartphone (99.64%). Among 284 students (52.11%), 148 participants are known to be dependent on smartphones. Based on the field of study, the highest percentage of dependency is related to public health, and the lowest percentage is related to nursing. Based on the year of graduation, the highest percentage of dependency is seen among third-grade students and the lowest among first-grade students.

A university study at Suleyman Demirel University, which randomly selected 319 students, was conducted in Sparta, Turkey. The research aimed to find the relationship between the severity of smartphone use, sleep quality, depression, and anxiety. Among 319 students, 248 (78%) were addicted to smartphones.¹³ Another cross-sectional study was conducted among the Middle Eastern population in 2017 by a questionnaire that collected information through social networks. The purpose of the research was to investigate the Prevalence and factors related to smartphone addiction and depression among the Middle Eastern population. The set of valid questionnaires was 935. The graphs show that 17% of the participants were addicted, 64% were mildly addicted, and 19% were non-addicted.¹⁴ In the above research, there are two categories of dependent participants: one is dependent, and the second is mildly dependent, where the general percentage of dependent participants reaches 81%. The reason for the high percentage of this research, according to the current research,

may be changes in the population. This research was done through social media, which means that the people who participated in the research were all following social media. However, the population of the current research is medical students, whose lessons and busyness are far more than those who mostly follow social media. A cross-sectional study in 2020 of 2,182 first-year college students of Wannan Medical College, located in China, took place under research. The research aimed to investigate the Prevalence of smartphone addiction and its relationship with personal factors, mental health, and professional personality. Out of the number of 2182 students, 866 (39.7%) of them were known to be addicted to smartphones based on SAS-SV.² The results of this research show that the prevalence is lower than the current research, which may be due to the type of sampling. This means that this research has used convenience sampling; probably, students who use smartphones more may not have participated in the research due to feelings of shame, and so on. Or it may be because of the difference in research conducted each year. Except for a few other studies, dependency results of all studies have risen over the year; even the discussion part of this study mentioned that this Medical College has also said that compared to the previous research (29.8%²¹). It shows a large increase. A cross-sectional study at King Abdul-Aziz University (KAU), located in Jeddah, showed that 387 students were studied. From the total sample of 387 students, (66.4%) 257 people were smartphone addicted based on SAS-SV. This study aims to investigate the relationship between smartphone addiction and wrist/thumb pain and to determine the worsening of the pain and prevalence of Quervain tenosynovitis among medical students of KAU University.¹⁰ The prevalence of the above research is higher than the current research; the main probable reason may be the COVID-19 pandemic. This research was conducted in 2020, which was the exact time of the COVID-19 pandemic. In this field, most researchers have found evidence of a relationship between smartphone dependency and COVID-19 or the Internet and COVID-19. This research can be an example: (The COVID-19 outbreak has affected many people around the world, but most importantly,

it has negatively affected teenagers by helping increase the use of media and smartphones, making them more susceptible to smartphone addiction).²² A cross-sectional study was conducted from October 14 to November 14, 2020, through an online questionnaire among students of Wannan Medical College. Out of 2,741 students, 1,447 (52.8%) were known to be smartphone addicted based on SAS. This study was done to examine smartphone addiction and its effects on health and Insomnia.¹¹ The results of this research (52.8%) are completely consistent with the results of the current research (52.11%). Another cross-sectional study was conducted among medical students of the pre-clinic course in the faculty of Medicine and Dentistry at a public university in Malaysia through convenience sampling. This study was conducted to identify the prevalence of smartphone addiction risk and related factors among medical and dental students in a public university in Malaysia. Of the total 328 students, 225 participants were from the Faculty of Medicine and 102 from dentistry. The Prevalence of smartphone addiction among them, based on SAS-SV, was 47.9%.¹² The results of this research are relatively consistent with the current research (52.11%). According to the research mentioned above and other international research, we see that smartphone dependency is not the same in all countries, and there are huge differences. A survey was conducted from February to June 2015 on a sample of 127 school classes with a collection of 1519 valid questionnaires in Switzerland; out of 1519 students, only 256 (16.9%) were known to be addicted to smartphones based on the German version of SAS-SV.⁸ But in some studies, the Prevalence (Sparta, Turkey, mentioned above) goes up to 78%.¹³ One reason for the low prevalence in the Swiss research may be the sample population, and we know that most of the young people who go to school own fewer smartphones than university students. The second reason can be the year of research. On the one hand, we see that the numbers in the sales graphs of smartphones increase dramatically every year, and it is clear that when the number of smartphones increases, the use and, finally, the prevalence of dependency also increase. On the other hand, the research conducted during the years of the COVID-19 pandemic shows a high percentage of the Prevalence of smartphone dependency. People have turned to social networks and personal phones due to the quarantine and the loss of their daily jobs; in short, COVID-19 can be one of the causes of increasing smartphone dependency. As a general conclusion, I can say that the issue of smartphone dependency is a multifactorial problem, which can be affected by various variables such as job, place of residence, year, social situation, etc.

That is why different research around the world has different results. Strengths and weaknesses. In this research, I tried as much as possible to follow and apply all the criteria of standard research. However, it does not mean that it is completely free of weaknesses and errors. One of these weaknesses is drawing

References

1. Robert West, Jamie Brown. Theory of Addiction: What are definitions? The changing definitions of addiction, Current variation in definitions of addiction, Diagnosing and measuring addiction.PDF Drive. 2013.P10, 11, 12, 13 & 20 Available at: <https://pdfdrive.to>
2. Huan Liu, Zhiqing Zhou, Ergang Zhu, et al. Smartphone addiction and its associated factors

interns from the stomatology and medicine departments. The mentioned interns come to the university once every four weeks due to their work commitments, and I unfortunately had very little chance of finding them. Another weakness that I noticed during the research was the lack of accountability of the research participants. But on the other hand, it has more strengths. First, I used new sources as much as possible. The second point is getting unbiased information from the most reliable journals in the world or from the most reliable statistical sites, such as Statistics of America, the network's data center in China, and so on.

Generalization

It is a pity that not only this research but also the world's authoritative research cannot represent the entire population in terms of smartphone dependency. As I mentioned earlier in the discussion section, this is a multifactorial problem; it differs from one region to another, from one society to another, and even from one year to another. The best possible way is to investigate the severity of this problem at the level of each community and region and take relevant actions to solve it.

Conclusion

In general, 52.11% of participants were dependent on smartphones. Among all participants, the highest level of addiction is related to public health (69.09%), and the lowest level (36%) is related to nursing. According to the academic year, the third class, with 61.9% of people dependent on smartphones, won first place, compared to the first class, with 42.5% of dependent people. According to the results of this research, it is clear that more than half of the students suffer from smartphone dependency. If we see the results carefully, public health has the most dependent people among them. The reason for this rise may be the difference between the future work areas of different departments. Public health usually deals with the public system, which mostly receives information through smartphones and the Internet. However, other departments usually have to spend most of their time on practical exercises, lessons, and books because of their clinical area. Or there may be other reasons that are impossible to find in this study.

Suggestions

- Universities' public awareness departments should work on increasing public awareness about the physical and mental harm of continuous use of smartphones. Through posters, social media, short cartoon movies, workshops, and campaigns.
- Future research should explore the reasons for high smartphone use among students. And find the relationship between smartphone dependency and health problems, such as mental illnesses, anxiety, depression, wrist pain, insomnia problems, etc.

among freshmen medical students in China: a cross-sectional study: Introduction, Results, Abstract, Discussion. BMC Psychiatry 2022. 22. P1, 2, 4, and 5 are Available at. Available at <https://doi.org/10.1186/s12888-022-03957-5>

3. YING LI, GUANGXIAO LI, LI LIU, et al. Correlations between mobile phone addiction and anxiety, impulsivity, and poor sleep

- quality among college students: A systematic review and meta-analysis: Introduction. *J Behavioral Addiction*. 2020; 9. P1. Available at <https://doi:10.1556/2006.20.20.00057>
4. Suliman S, Aljomaa, Mohammad F, AlQudah, Ismael S, Albursan, et al. Smartphone addiction among university students in the light of some variables: Introduction. *J ScienceDirect*. 2016; 61. P1&2. Available at <https://www.elsevier.com/locate/comphumbeh>
 5. Statista.com. Number of smartphones sold to end users worldwide from 2007 to 2022 . Accessible in. 2023/Jan. Available at <https://www.statista.com/statistics/263437/global-smartphone-sales-to-end-users-since-2007>
 6. Josh Howarth. How Many People Own Smartphones: Smartphone Ownership Statistics, How Many Smartphones Are There? 2023/Jan. Accessible in <https://explodingtopics.com/blog/smartphone-stats#number-of-smartphones>.
 7. China Internet Network Information Center (CNNIC). The 50th Statistical Report on China's Internet Development: Number of Mobile Phone Base Stations. 2022/Aug. P6.
 8. SEVERIN HAUG, RAQUEL PAZ CASTRO, MIN KWON, et al. Smartphone use and smartphone addiction among young people in Switzerland: Results, Discussion. *J Behavioral Addiction*. August 22, 2015. P 5 & 6. Available at <https://doi:10.1556/2005.4.2015.037>
 9. Balan Rathakrishnan, Soon Singh Bikar Singh, Mohammad Rahim Kamal Uddin, et al. Smartphone Addiction and Sleep Quality on Academic Performance of University Students: An Exploratory Research: Abstract, Results, Discussion. *J Environmental and Public Health*. 5 August 2021. P 1, 6 & 8. Available at <https://doi.org/10.3390/ijerph18168291>
 10. Ayman Baabdullah (MBBS), Diyaa Bokhary (MBBS), Yousef Kabli (MBBS), et al. The association between smartphone addiction and thumb/wrist pain a cross-sectional study: Results, Discussion. *J Medicine*. 10 January 2020. P 2 & 3. Available at <http://dx.doi.org/10.1097/MD.00000000000019124>
 11. Huan Liu, Zhiqing Zhou, Long Huang, et al. Prevalence of smartphone addiction and its effects on sub health and insomnia: a cross-sectional study among medical students: Results, Abstract. *J BMC Psychiatry*. 2022. P 1 & 3. Available at <https://doi.org/10.1186/s12888-022-03956-6>
 12. Abdul Hadi Said, Farah Natasha Mohd, Muhammad Zubir Yusof, et al. Prevalence of smartphone addiction and its associated factors among pre-clinical medical and dental students in a public university in Malaysia: Abstract, Results & Discussion. *J Malaysian Family Physician*. 2022; Volume 17. P 1, 3, 5 & 7. Available at <https://doi.org/10.51866/oa.75>
 13. KADİR DEMİRÇİ, MEHMET AKGÖNÜL and ABDULLAH AKPINAR. Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students: Abstract & Results. *J Behavioral Addiction*. April 26, 2015. P 1& 3. Available at <https://doi:10.1556/2006.4.2015.010>
 14. Aljohara A. Alhassan, Ethar M. Alqadhib, Nada W. Taha, et al. The relationship between addiction to smartphone usage and depression among adults: a cross-sectional study: Abstract, Discussion & Results. *J BMC Psychiatry*. 2018. P 1, 3 & 4. Available at <https://doi.org/10.1186/s12888-018-1745-4>
 15. Meng Xuan Zhang& Anise M.S. Wu. Effects of smartphone addiction on sleep quality among Chinese university students: The mediating role of self-regulation and bedtime procrastination: Abstract & Results. *J ELSEVIER*. 13 July 2020. P 1 & 3. Available at <https://doi.org/10.1016/j.addbeh.2020.106552>
 16. Jay A. Olson, Dasha A. Sandra, Elissa S. Colucci, et al. Smartphone addiction is increasing across the world: A meta-analysis of 24 countries: Abstract & Results. *J ELSEVIER*. 2022. P 1-4. Available at <https://doi.org/10.1016/j.chb.2021.1107138>
 17. Richard Emanuel, Rodney Bell, Cedric Cotton, et al. The truth about smartphone addiction: Abstract & Result. *J ResearchGate*. January, 2015. P 3, 10 & 11. Available at <https://www.researchgate.net/publication/281243425>
 18. Kums.edu.af. تاریخچه و دیدگاه. 2019. Available at <https://www.kums.edu.af/dr/%d8%aa%d8...>
 19. Min_Kwon, Dai-Jin Kim, Hyun Cho, et al. The Smartphone Addiction Scale: Development and Validation of a Short Version for Adolescents. *J Plos One*. December 31, 2013. Available at <https://doi.org/10.1371/journal.pone.0083558>
 20. Masters in Data Science. How to deal with missing data: Imputation vs Removing Data. Master in Data Science. 2023. Available at <https://www.mastersindatascience.org/learning/how-to-deal-with-missing-data/....>
 22. Chen B, Liu F, Ding S, et al. Gender differences in factors associated with smartphone addiction: a cross-sectional study among medical college students. *BMC Psychiatry*. 2017; 17(1):341.
 23. JongSeri Chun, Hae Kook Lee, HyeSook Jeon, et al. Impact of COVID-19 on Adolescents' Smartphone Addiction in South Korea: Abstract. PMID. Oct 2022. Available at <DOI:10.1080/19371918.2022.21342>

