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### References

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Focused Small-Group Teaching in ENT: 3 Years' Experience in 159 Medical Students

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## Internet/Digital Use Among Medical College Students of King Khalid University, Saudi Arabia

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#### Institution

Abstract

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Objective: Modern-day lifestyles have a heavy dependence on various digital technologies for information, inter-personal relationships, entertainment, and even economic transactions. The number of hours being spent by individuals has been increasing day by day. Due to the addictive nature of the problem, the terms Internet Addiction and Digital Addiction Disorder have been coined. With the aim to analyse epidemiological aspects of Internet/digital usage amongst medical students studying at King Khalid University, Abha, Saudi Arabia, we conducted this study.

Patients and Methods: In this prospective study, 153 subjects responded to an online questionnaire sent through WhatsApp. The majority of respondents were female medical students, followed by dental students.

Results: The results of the study found that about 21.57% of students were using the Internet for more than 10 hours out of 24 daily. The most commonly used application on their mobiles was WhatsApp (94.12%). A further 42.48% of students suffered from sleep disturbance, while 44.4% thought that digital devices were very important to their lives.

Conclusion: The study revealed a very serious trend regarding the time spent by students on the internet and the associated adverse health issues. There was evidence of dependence noted in a subset of students. It was concluded that awareness is a key factor as internet usage is personal and has an impact on both individuals and society as a whole.

#### **Key Words**

Internet, Addiction, Digital Devices

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#### Introduction

The Internet has brought about a revolution in the present-day digital world. The Internet is reaching an incredible speed and, at the same time, more of the world's population is gaining access to it. With the simultaneous expansion in innovations like smartphones, laptops, and iPods, the lives of present -day human beings have been affected in all spheres. This combination has changed the technical ways and approaches to education, business, and economics and has gone beyond to non-technical communities, social networking, and collaborative services. In the form of Facebook, Twitter, Linked-In, YouTube, and Wikis, the Internet has enabled people to communicate and share interests in many more ways. But how much internet is acceptable in terms of time, type, and content is quite variable. With people spending lot of time on the internet, terms like "Internet addiction" came up in research papers. Griffiths<sup>1</sup> was the first person who considered internet addiction to be a kind of technological addiction (such as computer addiction). He considered it as one in a subset of behavioral addiction (such as compulsive gambling).

With this background, we focused on the use of the internet among students of a Saudi university. We aimed to look at the time, type, content, health issues and other related aspects among the students in relation to internet usage. Although there have been many studies around the globe, we are the first group carrying out this study in Saudi Arabia. This study focused on students in the medical and allied colleges of King Khalid University.

 Table 1: Distribution of the studied group regarding age

A S.N									
	Asser Central H	ospit	al 1			KKU, College of Medicine 2			
B Working	KKU, College of Dentistry 3				KKU, College of Dentistry 4				
Place/Studying Place	KKU, College of	Nur	sing 5			KKU, College of Dentistry 6			
	Others		7						
C Sex	Male 1					Female 2			
D Social Status	Married 1					Single 2	)		
E Age Group	15-25 1	26-	35 2		36-45 3		46-5	54	56-65 5
F Number of Hours Spent on Internet	Less than 1 hour		1-2 ho	ours		2-3 hours			More than 3 hours
<b>G</b> Number of Times You Check Your Mobile per Hour	Less than 5 times 5-10 ti		times 1		11-15 times			More than 15 times	
H M/bat do you	WhatsApp 1		Facebook 2		Twitter 3			Snapchat 4	
use the device	Instagram 5		Blogging and Vlogging 6		Reading e-Books 7		oks 7	Education 8	
choose more than one).	News 9 Sports		5 10	10 YouTube and ot video apps		other os 11	Religion 12		
than only.	Others 13								
	Anxiety 1		Depre	ssion	2	Addiction 3			Stomach upset 4
Do you have	Headache 5		Eating	disor	ders 6	Neck p	ain /		Back pain 8
any of the fol- lowing?	Dry eye 9		Visual 10	distur )	bances	Sleep d	isturba	ances	Family problems
	Other health issue 13								
J How impor- tant are digital devices to you?	Very important 1	y important 1 Important		ortant 2			Neces	ssary 3	
K Do you think you could live without digital devices?	Yes 1		No 2	2			Canno	ot answer 3	

	Number of Participants	Percentage of Participants (%)
Age Group		
18-25	144	94.1
26-35	8	5.2
36-45	0	0.0
46-55	0	0.0
55-65	1	0.7
Total	153	100.0



Figure 1: Distribution of the studied group regarding age

#### Materials and Methods

This study was conducted among the students of various health-related branches like medical, nursing, and dental.

1. **Questionnaire:** (Figure 1) A team consisting of the rank of assistant professor and students from different specialties framed a questionnaire. The questionnaire was based on the various aspects of the internet and digital usage using common questions. It consisted of a total of 10 questions, with 7 directly related to internet usage.

Students received the questionnaire through WhatsApp groups. Everyone was given the

option to participate or not. Replying to the questionnaire was taken as voluntary participation. No participant needed to disclose his or her personal details like their name, address or email. The questionnaire was sent to more than 300 students/staff within different colleges and both sexes, but unfortunately, it was mainly the girls who replied. We received a reply from 153 participants only.

- 2. **Collection of Data:** The data received from the questionnaire were entered in Microsoft Excel by three student editors. All the data entered was doubly checked.
- 3. **Analysis of Data:** The data collected was analysed with the help of the Bio-statistics department of the university.

Table 2: Distribution of the studied group regarding sex

Sex	Number of Participants	Percentage of Participants (%)
Female	139	90.9
Male	14	9.1
Total	153	100.0



Figure 2: Distribution of the studied group regarding sex

Marital status	Number of Participants	Percentage of Participants (%)
Single	143	93.5
Married	10	6.5
Total	153	100.0



Figure 3: Distribution of the studied group regarding marital status

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 Table 4: Distribution of the studied group regarding college

College	Number of Participants	Percentage of Participants (%)
Medical	139	90.8
Dental	9	5.9
Pharmacy	2	1.3
Applied Medical Sciences	3	2.0
Total	153	100.0



Figure 4: Distribution of the studied group regarding college

Table 5: Distribution of the studied group regarding job

Job	Number of Participants	Percentage of Participants (%)
Student	150	98.0
Faculty member	0	0.0
Other staff	3	2.0
Total	153	100.0

Student

Faculty Member

Other Staff



Figure 5: Distribution of the studied group regarding job

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 Table 6: Distribution of the studied group regarding job

Number of Hours Spent on the Internet per Day	Number of Participants	Percentage of Participants (%)
<2 hrs	36	23.53
2-5	62	40.52
5-10	22	14.38
>10	33	21.57
Range	1-14	
Mean	4.21	
S.D.	3.22	
Total	153	100.0



Figure 6: Distribution of the studied group regarding the number of times they check their mobile per hour

Number of Times You Check Your Mobile per Hour	Number of Participants	Percentage of Participants (%)	
<1	39	25.49	
1-3	45	29.41	
4-6	36	23.53	
6-10	21	13.73	
>10	12	7.84	
Total	153	100.0	





Figure 7: Distribution of the studied group regarding the number of times they check their mobile per hour

What do you use your device for?	Number of Participants	Percentage of Participants (%)
WhatsApp	144	94.12
Twitter	115	75.16
Education	103	67.32
Videos	87	56.86
Games	42	27.45
News	41	26.80
Sports	21	13.73
Religion	19	12.42
Facebook	12	7.84
Others	25	16.34
Total	153	100.0

Table 8: Distribution of the studied group regarding what they use their device for

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Figure 8: Distribution of the studied group regarding what they use their device for

Do you have any of the following symptoms?	Number of Participants	Percentage of Participants (%)
Sleep disturbance	65	42.48
Anxiety	53	34.64
Dry eye	48	31.37
Headache	47	30.72
Visual disturbance	44	28.76
Back pain	38	24.84
Depression	37	24.18
Neck pain	31	20.26
Eating disorder	25	16.34
Stomach upset	22	14.38
Family problems	22	14.38
Any other health issue	9	5.88
Total	153	100.0

Table 9: Distribution of the studied group regarding whether they had any of the symptoms provided



Figure 9: Distribution of the studied group regarding whether they had any of the symptoms provided

Number of Psychological Complaints	Number of Participants	Percentage of Participants (%)
One	18	11.8
Two	29	19.0
Three	66	43.1
Four	33	21.6
Five	10	6.5
Total	153	100.0

Table 10: Distribution of the studied group regarding the number of psychological complaints

Table 11: Distribution of the studied group regarding the importance of digital devices

How important are digital devices to you?	Number of Participants	Percentage of Participants (%)			
Very important	68	44.4			
Important	52	34.0			
Necessary	33	21.6			
Total	153	100.0			



Figure 10: Distribution of the studied group regarding the ability to live without digital devices

Do you think you could live	Number of Darticipants	Percentage of		
without digital devices?		Participants (%)		
Yes	47	30.7		
No	64	41.8		
Cannot answer	42	27.5		
Total	153	100.0		

 Table 12: Distribution of the studied group regarding the ability to live without digital devices



*Figure 11*: Distribution of the studied group regarding the ability to live without digital devices

		Number										
	On "n=1	e 8″	Tw "n=2	0 9″	Th "n=	ree :66″	Four or more "n=43"		Four or Total more "n=43"		otal	P-value
Sex	No.	%	No.	%	No.	%	No.	%	No.	%		
Male	16	88.9	24	82.8	60	90.9	39	90.7	139	90.9	0.152 N.S.	
Female	2	11.1	5	17.2	6	9.1	1	2.3	14	9.1		

■ Male ■ Female





Figure 12: Relationship between the number of symptoms and gender

	Number of Psychological Complaints										
	One "n=18"		Two "n=29″		Three "n=66"		Four or more "n=43″		Total		P-value
College	No.	%	No. %		No.	%	No.	%	No.	%	
Medical	16	88.9	27	93.1	65	98.5	31	72.1	139	90.8	
Dental	1	5.6	2	6.9	1	1.5	5	11.6	9	5.9	
Pharmacy	1	5.6	0	0.0	0	0.0	1	2.3	2	1.3	0 011
Applied Medical Sciences	0	0.0	0	0.0	0	0.0	3	7.0	3	2	N.S.

Table 14: Relationship between the number of symptoms and the participant's place of study

	Numb	per of Psy										
	One "n=18"		Two "n=29"		Three "n=66"		Four or more "n=43"		Total		P-value	
Number of Hours Spent on the Internet per Day	No.	%	No.	No. %		%	No. %		No.	%		
<2 hrs	18	100.0	7	24.1	11	16.7	0	0.0	36	23.53		
2-5	0	0.0	14	48.3	36	54.5	12	27.9	62	40.52		
5-10	0	0.0	8	27.6	10	15.2	4	9.3	22	14.38	0.0001*	
>10	0	0.0	0	0.0	9	13.6	24	55.8	33	21.57		

Table 15: Relationship between the number of symptoms and the number of hours spent on the internet per day



■ <2 hrs ■ 2-5 ■ 5-10 · ■ >10

Figure 13: Relationship between the number of symptoms and the number of hours spent on the internet per day

Table 16: Relationship between the number of symptoms and the number of times one checks their mobile per hour

	Numbe	er of Psy									
	One		Тwo		Three		Four or more		Total		P-value
	"n=18"	r	"n=29″		"n=66"		"n=43"		1		
Number of Times You Check Your Mobile per Hour	No.	%	No.	%	No.	%	No.	%	No.	%	
<1	18	100.0	20	69.0	1	1.5	1.5	0	39	25.49	
1-3	0	0.0	8	27.6	27	40.9	40.9	10	45	29.41	
4-6	0	0.0	1	3.4	20	30.3	30.3	15	36	23.53	0.001*
6-10	0	0.0	0	0.0	18	27.3	27.3	3	21	13.73	
>10	0	0.0	0	0.0	0	0.0	0.0	12	12	7.84	



Figure 14: Relationship between the number of symptoms and the number of times one checks their mobile per hour

#### Results

- 1. The total number of student respondents were 153. The majority of students belonged to the age group of 18-25 (94.1%). (**Table 1** and **Figure 1**).
- 2. Sex: Most of the respondents were females (90.9%). (Table 2 and Figure 2).
- 3. Marital Status: The majority of subjects were single (93.5%). (Table 3 and Figure 3).
- Technical Background: More than half of the participants (90.8%) were students at Medical School, followed by students at Dental School (5.9%); the remaining were from Allied Medical Sciences branches (Table 4 and Figure 4).
- 5. **Staff/Student:** The majority of the respondents were students (98%) as presented in **Table 5 and Figure 5**.
- 6. Duration of Usage: 23.53% participants stated that they used the internet for an average of 2 hours. 40.52% of respondents used the internet from 2-5 hours per day followed by 14.38% respondents who stated that they were using the internet for 5-10 hours per day. Strikingly, about 21.57% respondents were using the internet for more than 10 hours per day (Table 6 and Figure 6).
- Repeated Mobile Phones Checking: As for checking their mobile per hour, 29.41% of subjects checked their phones 1-3 times per hour, 25.49% checked their phones once per hour, 23.53% of subjects checked their phones 4-6 times per hour, 13.37% of subjects checked their phones 6-10 times per hour while 7.84% of subjects used their phones more than 10 times per hour (Table 7 and Figure 7).
- Applications Used (More Than One Answer): The percentage of the most commonly used applications on mobiles were WhatsApp (94.12%), followed by Twitter (75.16%); 67.32% used phones for education and 56.86% used phones for watching videos. (Table 8 and Figure 8).
- Symptoms/Complaints: As for the symptoms of using phones, the results are presented in Table 9 and Figure 9. Most of the participants (42.48%) suffered from sleep disturbance, followed by anxiety (34.64%), dry eye (31.37%), headache (30.72%) and visual disturbance (28.76%).
- 10. **Number of Complaints:** The study reveals that most of the subjects (43.1%) suffered from at least 3 complaints, 21.6% suffered from 4 complaints and 19% suffered from 2 complaints, while only 6.5% suffered from 5 complaints and 11.8% suffered from one complaint. (**Table 10**)
- 11. Digital Dependence: Most of the subjects

(44.4%) thought that digital devices are very important for their lives, 34% of subjects thought it is important for their life and 21.6% rated digital devices as necessary for their life (**Table 11**). Most of the subjects (41.8%) answered that they can't live without their devices, 30.7% said yes they can live without their devices while 27.5% can't answer this question (**Table 12**).

12. Correlation Between the Subjects Demographics and the Symptoms of Using Digital Devices: There was no significant difference between the number of complaints and the gender and college (Table 13 and 14). On the other hand, the higher the number of hours spent on the internet, the higher the number of psychological complaints with a significant relationship (Table 15). Table 16 showed a significant relationship between the number of psychological complaints and the higher number of times checking their mobile.

#### Discussion

In the present era, our lives have a very heavy dependence on various digital technologies for information, inter-personal relationships, entertainment, and even financial transactions. As there is now over-dependence on digital technology, it often results in addiction. It was Goldberg<sup>2</sup> who coined a term for pathological use of the internet, terming it "Internet Addiction Disorder (IAD)". Digital addiction is not different from other addictions; those suffering from it exhibit compulsive behaviour and often use the virtual fantasy world as a substitution for real-life human connection. Even though all true effects are not known, it has been established that the life of an addicted user leads to social isolation, anxiety, depression, immune system disruption, brain damage, and even death.

It was Kandell<sup>3</sup> who defined Internet addiction as "a psychological dependence on the Internet, regardless of the type of activity once logged on". As per him, college students as a group appear more vulnerable in developing a dependence on the internet than any other segment of society. The reason he gave was that college students have a strong drive to develop a firm sense of identity and to develop meaningful and intimate relationships. They usually have free and easily accessible connections, and their internet use is implicitly, if not explicitly, encouraged. Although the majority of people use the internet in healthy and productive ways, some college students develop a "pathologic" use of the internet.

In order to compare our results with other studies,

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we could not find any previous study dealing with these factors. However, we found many leading news agencies have conducted surveys about digital dependence so we compared mainly with them. In our study, we received the maximum number of responses from female students only. However, previous studies reveal that for public institutes there were no gender differences in the amount of time spent on the internet, however, at private institutions, males spent significantly more time online than females  $(p = 0.019)^4$ . The Telegraph News UK published an article, "a decade of smartphones"<sup>5</sup>. The article provides a survey on digital usage; the main points of relevance to our research include that, on average, the maximum usage of internet in the 16-24 age group is 34.3 hours per week. We found that the majority of students in our study belonged to the 18-25 age group (94.1%), but to our surprise, 35% of students were using the internet for more than 5 to 10 hours in a single day. They found that young people also check their phones every 8.6 minutes, which is more frequent than any other age group. We found that the repeated checking was either the same or less in our study, but it may be because the person is already working on their phone for long durations so does not check their phone repeatedly. Regarding the apps or websites used, there is variation. In general, it is usually Facebook, WhatsApp, Instagram, or Twitter which are commonly used throughout the world; this is almost the same as the findings of our group. However, a good point worth noting is that 67.32% admitted that they use the internet for educational purposes as well.

Our study revealed that the most common issue among students was sleep disturbance. A recent review article has found that there is significantly shorter total sleep time with greater mobile device screen time reported in 10/12 studies. The same review reports in 5/5 studies a greater subjective day-time tiredness or sleepiness<sup>6</sup>. Studies have revealed a moderate evidence of association in about 34.64% of subjects<sup>7</sup>. Dry eyes and visual disturbances were also a major presentation in the study group. It has recently been established that individuals in possession of a mobile phone for more than 2 years are at a significantly increased risk of blurred vision (p<0.05) compared to users in possession of a mobile phone for fewer than 2 years<sup>8</sup>. In users of mobile phones, women complained significantly (p<0.05) more often of inflammation in the eyes than men<sup>8</sup>. Headache was complained about by 30.72% of students. The headache associated with mobile phone usage is called HAMP (headache associated with mobile phones). It is defined as a headache attack during

mobile phone use or within 1 hour after mobile phone use. A study concluded that HAMP usually showed stereotyped clinical features including mild intensity, a dull or pressing quality, localisation ipsilateral to the side of mobile phone use, provocation by prolonged mobile phone use and was often accompanied by a burning sensation<sup>9</sup>.

We found that most of the subjects (41.8%) answered that they can't live without their devices. We also found from our study that the more time spent on mobile and other digital devices, the greater the number of associated psychological issues.

#### Conclusion

The study revealed a very serious trend in terms of the time spent by students on the internet and the associated adverse health issues, with evidence of dependence in a subset of students. Despite the size being low and limited to a well-defined group, we recommend that the need of the hour is to act at three different levels. Students at the individual level need to be educated about the proper use of the internet and digital devices at the induction phase when they are most receptive. At the university level, proper software or applications need to be made so that students and staff can access relevant websites and apps within the university campus. At the society level, the educational and health sector needs to play a vital role so that masses are made aware of the individual, social, and health issues associated with improper and overuse of digital technology.

#### Limitations

There are two major shortcomings in this study. The first one is that the sample size is low and represents trends in a very specific group of students. The second one is that we did not look into internet usage and the impact on student grades and other educational achievements. We really feel any further studies would be quite helpful in understanding this new aspect of digital revolution and deciding whether it is boon or bane.

#### **Conflict of Interest**

All the authors declare there is no conflict of interest among them.

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MW designed the study, questionnaire and wrote the paper. LF, NF, AA modified the questionnaire

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