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Assessing Internet Addiction Levels Among Medical Students in Jordan: Insights from a Cross-Sectional Survey

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ABSTRACT This Study designed to explore internet addiction among medical students in Jordan, associated factors of internet addiction, possible effects on academic performance and possible interventions. A cross-sectionals study was performed with 172 medical students from different Jordanian university, aged 18-23 years. Internet Addiction Test (IAT) created by Dr. Kimberly Young was used to assess addiction level. The results showed that 43% of the students had medium internet addiction. These students mostly used social media activities for three to six hours daily. The study also revealed that male students had much more sever addiction than females. In addition, males had higher rate of medium internet addiction. Excessive use of the internet was inversely proportional to academic proportional to academic performance and sleep patterns according to previous studies as mentioned. Suggested solutions included controlled internet bundle, parental involvement, pharmacological and non-pharmacological treatments. The study emphasizes to find proper strategies to prevent internet addiction among medical students and stands firm on early interventions to stop the negative consequences.

INDEX TERMS Internet Addiction, Medical Students, social media usage.

I. INTRODUCTION

In recent years, the use of internet has greatly increased among students on university campuses and among people in society. Moreover, internet primary use in an academic field is for learning and doing researches. Internet has also played an important role in students' life [1]. Internet is mainly created for searching about various information and share information among other people. In addition, people now can't do some aspects of daily life tasks easily without internet. Internet becomes essential in many aspects including personal communication, education and health aspects. Shopping online, business and entertainment which could be as social media applications are other aspects that internet could play an important role to present them to people out of screen [2]. For medical students, using internet is essential in their lives and unavoidable due to the modern transformation of medicine practices such as, telemedicine and evidence-based medicine [3]. Medical students often use internet and rely on it for searching medical literatures and relevant information. They use internet for these purposes because it's more affordable than buying books. Furthermore, being easily able to access to internet and using it for causal uses in addition to the academic use is also other factor that encourage students to use internet [4]. Recent studies indicated that the average use of internet of 38 hours per week can cause issues such as lack of sleep and experience excessive tiredness which will affects their academic performance and affects their concentration at lecturers [5]. This generation is vulnerable to have internet addiction. This is due to have a more modern culture where parents have less control over their children because parents are focusing more on their work and academic life. Teenagers and even children turn to internet hoping to meet their demands and escape their problems, which could be at school or family issues.

As technology and internet become more important and significant, it's difficult to distinguish between excessive and unnecessary internet use and between functional internet use [6]. In 2011, a study was made which handled among students at the Faculty of Health Prevention at the Medical University of Bialystok in Poland evaluated internet addiction. The findings showed that students who don't own a computer at home spent an average of 3 hours per day online, while those who didn't own a computer at home spent

anywhere from half to 8 hours daily [7]. However, another study managed by the Center of Internet Addiction in the USA, which involved 149 medical students from University of Sultan Zainal Abidin. The study showed that both male participants had average score of 44.9, on the other hand, female participants had average score of 41.4. These scores indicate mild internet addiction among both genders [8]. The use of internet has determined by various factors, including socio-economic status and gender, especially in the Middle East. A study was made on internet addiction among adolescents in northeastern Jordan showed that 93.78% of participants had internet addiction. A percentage of 65% were classified as moderate to severe addicts.

The study revealed that addiction rates were higher among male participants aged 16 to 19, who used Internet outside their homes, compared to female participants. These participants relieved poor performance in school, didn't use internet for education, or had parents who didn't control and monitor their internet usage [9]. A trial study assessed a treatment protocol for 39 patients who were dealing with anxiety and internet addiction. The treatment included both medications and modified cognitive behavioral therapy (CBT). Various Medications were prescribed by psychiatrists to approach panic disorder (PD), Generalized Anxiety Disorder (GAD) and internet addiction. These medications involved antidepressants such as, fluoxetine sertraline, venlafaxine, desvenlafaxine, paroxetine, escitalopram, zolpidem and duloxetine. In addition, anxiolytics were included too, such as clonazepam and alprazolam. Psychostimulants, like methylphenidate, and antipsychotics, like quetiapine, were also involved.

25 patients out of 39 were diagnosed with PD. While 14 patients were diagnosed with GAD, in addition to having internet addiction. The average anxiety levels of the patients before the treatment, measured by the HAM-A scale, an average score of 34.26 (SD 6.13) which suggests severe anxiety levels. After the treatment, the score dropped to 15.03 (SD 3.88), which reflects a significant reduction in anxiety. The average score of the Internet Addiction Test at the start was 67.67 (SD 7.69), which indicated a problematic internet use. After the treatment sessions, the average IAT score was decreased to 37.56 (SD 9.32), showing moderate internet use and a notable improvement in addiction levels [14][26][27]. Drugs are not always the solution for every medical problem. There are other solutions that have been found. A study defined a locally developed, multi-level counseling program which aimed at young people who struggled with internet addiction. This study was based on feedback from 59 participants. Objective outcome evaluations indicated that participants' internet addiction problem generally reduced after completing the program. Moreover, there were also little improvements in parenthood attributes. The evaluations showed that participants felt that the program was beneficial for them. Comprehensively, these results suggest that this multi-level counseling program keep promise for helping teenagers overcome internet addiction [15]. Moreover, parental control, limiting the daily internet use and having hobbies or doing some other activities with family are other solutions to avoid internet addiction. The aim of our research is to investigate Internet addiction among medical students, specifically in Jordanian public universities. Moreover, we will mention the factors that contribute to Internet addiction, solutions and the methods we used to investigate with ethical approval.

II. RELATED WORKS

Internet addiction has emerged as a significant concern in recent years, particularly among university students, who are among the most frequent users of digital technologies. Previous studies have explored the prevalence, predictors, and consequences of internet addiction, highlighting its impact on academic performance, mental health, and overall well-being.

A. PREVALENCE OF INTERNET ADDICTION

Research indicates that internet addiction is a global issue, with varying prevalence rates across different regions and populations. For example, a study conducted in Saudi Arabia found that 34% of university students exhibited symptoms of internet addiction [16]. Similarly, a study in Lebanon reported a prevalence rate of 28% among medical students [17]. In contrast, studies from Western countries, such as the United States, have reported lower prevalence rates, ranging from 10% to 15% [18]. These variations may be attributed to cultural, socioeconomic, and technological differences across regions.

B. PREDICTORS OF INTERNET ADDICTION

Several demographic and psychological factors have been identified as predictors of internet addiction. Gender differences are commonly reported, with male students often exhibiting higher levels of internet addiction compared to females [19]. Year of study has also been linked to internet addiction, with senior students more likely to report problematic internet use due to increased academic and social pressures [20]. Additionally, socioeconomic status has been found to play a role, with students from lower-income families more likely to experience internet addiction, possibly due to limited access to alternative recreational activities [21].

C. IMPACT ON ACADEMIC PERFORMANCE

The relationship between internet addiction and academic performance has been widely studied, with most research indicating a negative correlation. For instance, a study in Turkey found that students with higher internet addiction scores had significantly lower GPAs compared to their peers [22]. Similarly, a study in China reported that excessive internet use was associated with reduced study time, missed deadlines, and lower-class participation [23]. These findings underscore the detrimental effects of internet addiction on academic outcomes.

D. MENTAL HEALTH AND WELL-BEING

Internet addiction has also been linked to poor mental health outcomes, including anxiety, depression, and stress. A

study in South Korea found that students with high levels of internet addiction were more likely to report symptoms of depression and anxiety [24]. Similarly, a study in India highlighted the role of internet addiction in exacerbating stress levels among medical students, particularly during exam periods [25]. These findings suggest that internet addiction not only affects academic performance but also has broader implications for students' mental health.

E. GAPS IN THE LITERATURE

Despite the growing body of research on internet addiction, several gaps remain. First, few studies have focused specifically on medical students, who face unique academic and psychological pressures that may influence their internet use patterns. Second, there is limited research on internet addiction in the Middle Eastern context, particularly in Jordan. Finally, most studies have relied on cross-sectional designs, making it difficult to establish causal relationships between internet addiction and its predictors or outcomes. The current study aims to address these gaps by examining the prevalence, predictors, and consequences of internet addiction among medical students in Jordan.

III. METHODOLOGY

A cross-sectional study design was employed to examine internet addiction levels among medical students in Jordanian universities. Data collection was conducted using a structured questionnaire, which included demographic questions to collect student identity information and the Internet Addiction Questionnaire (IAQ) developed by Kimberly Young.

A. QUESTIONNAIRE STRUCTURE

The questionnaire consisted of 15 items, 5 of which were adapted from Young's Internet Addiction Questionnaire. Each item was measured using a five-point Likert scale, with response options defined as follows:

- **0** = Not Applicable
- **1** = Rarely
- **2** = Occasionally
- **3** = Frequently
- **4** = Often
- **5** = Always

The final internet addiction score for each participant was computed by summing the numerical values assigned to each response:

$$S = \sum_{i=1}^{N} Ri$$

Where S is the total internet addiction score, Ri represents the response score for question ii, and N is the total number of questions answered.

B. INTERNET ADDICTION CLASSIFICATION

The Internet Addiction Test (IAT) developed by Kimberly Young originally consists of 20 questions, with a maximum total score of 100. To classify internet addiction levels, the following thresholds were used:

$$\begin{cases} 0 \le S \le 30, \text{Normal internet usage (not addictive)} \\ 31 \le S \le 49, \quad \text{Mild level of internet addiction} \\ 50 \le S \le 79, \text{Moderate level of internet addiction} \\ 80 \le S \le 100, \quad \text{Severe internet addiction} \end{cases}$$

Since our study used a 15-item version of the questionnaire, the maximum score achievable was 75. To align our findings with the established IAT classification, we adjusted the threshold proportionally by applying the following transformation:

$$S_{adj} = \frac{S}{75} \times 100$$

Where: S_{adj} is the adjusted score on a scale of 100.
Using this transformation, the internet addiction classification remains consistent with the original IAT scale. The adjusted classification is:

$$\begin{cases} 0 \le S_{adj} \le 30, \text{Normal internet usage (not addictive)} \\ 31 \le S_{adj} \le 49, \quad \text{Mild level of internet addiction} \\ 50 \le S_{adj} \le 79, \text{Moderate level of internet addiction} \\ 80 \le S_{adj} \le 100, \quad \text{Severe internet addiction} \end{cases}$$

C. DATA COLLECTION AND ANALYSIS

Data were collected through online distribution of the questionnaire. However, a statement was provided at the beginning of the questionnaire, informing participants about the study's purpose, ensuring anonymity, and emphasizing voluntary participation. After responses were gathered, the total internet addiction scores were computed for each participant using the summation formula. Descriptive statistics, such as mean, standard deviation, and frequency distributions, were used to analyze the scores. Further statistical tests were applied to identify any significant differences in addiction levels based on demographic factors such as age, gender, and study year.
This methodology ensures a structured approach to assessing internet addiction while maintaining alignment with established classification frameworks.

IV. RESULTS

The total number of students who answered the questionnaire is 172 medical students. Data such as, Age, gender, place of residence, academic year were collected. Beside these data and questions, the questionnaire contains other questions regarding internet usage. In addition, Main location of using the internet, main time of using the internet, on which subject they spend the most time on the internet (scientific topics, research, web browsing, online chatting, social media (YouTube, Instagram, Facebook, Tik Tok, etc.) and their daily internet use (in hours).

A. P-VALUE INTERPRETATION

The p-value is a statistical measure used to determine the significance of differences between groups. A lower p-value (typically ≤ 0.05) suggests that the observed differences are

statistically significant and unlikely to be due to chance. In this study, significant p-values were found in place of residence ($p = 8.2 \times 10^{-3}$), academic year ($p = 1.97 \times 10^{-7}$), affordability of internet payment ($p = 0.0206$), main location of internet use ($p = 9.19 \times 10^{-12}$), preferred online activity ($p = 15 \times 10^{-9}$), and daily internet usage hours ($p = 8.36 \times 10^{-15}$). This indicates that these factors have a meaningful impact on internet addiction levels among the surveyed students. However, gender ($p = 0.47$) and the main time of internet use ($p = 0.248$) did not show statistically significant differences in internet addiction levels. The demographic characteristics of the study participants are summarized in Table 1.

TABLE 1
Demographic Characteristics of Participants

Variable	Category	Frequency (n)	Percentage%	p-Value
Age/years	19	79	45.8%	-
	20	53	30.6%	-
	23	14	8.3%	-
	21	12	6.9%	-
	22	7	4.2%	-
	18	7	4.2%	-
Gender	Female	110	63.9%	0.47
	Male	62	36.1%	
Place of Residence In Jordan	North	42	24.7%	8.2×10^{-3}
	Central	110	63.9%	
	South	9	5.6%	
	Other	10	5.8%	
Year of Study	First	52	30%	1.97×10^{-7}
	Second	43	25%	
	Third	43	25%	
	Fourth	34	20%	
(Income)	Low	52	30%	-
	Middle	86	50%	-
	High	34	20%	-
Internet Addiction Level	No	-	12% (M) 8.5% (F)	0.47
	Mild	-	44% (M) 38.3% (F)	
	Moderate	-	41.8% (M) 42.5% (F)	
	Severe	-	2.2% (M) 6.3% (F)	
Main Location of Internet Use	Home	-	85.0%	9.19×10^{-12}
	Classroom	-	1.4 %	
	Public	-	13.6%	
Main Time of Internet Use	Morning to Afternoon	-	18.1%	0.248
	Afternoon to Evening		13.8%	
	Evening to Night	-	52.8%	
	Night to Morning	-	15.3%	
Internet Usage Purpose	Social media	-	74.2%	1.5×10^{-9}
	Research	-	37.5%	
	Online Chatting	-	10%	
	Web Browsing	-	9%	

Figure 1 shows the students who responded to the questionnaire were aged between 18-23 years old. The majority of them were aged 19 years old (45.8%) and 20 years old (30.6%). There were less responses from students aged 23 years old (8.3%), 21 years old (6.9%), 22 years old (4.2%) and 18 years old (4.2%).

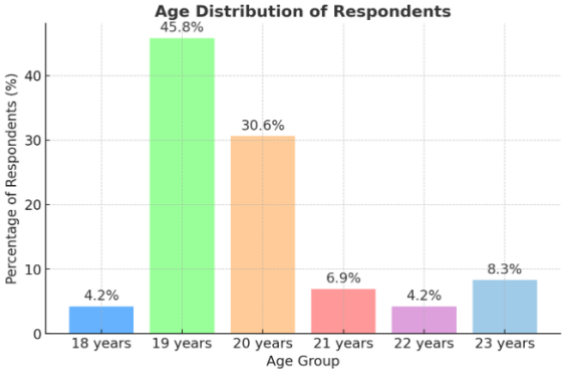

FIGURE 1. **Age Distribution of Respondents**

Figure 2 shows the majority of responders were females (63.9%), while responses from males were 36.1%.

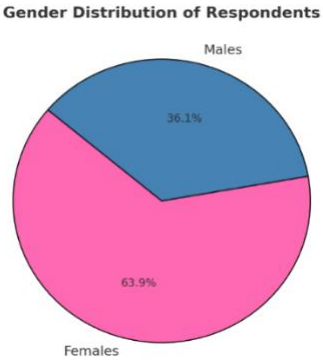

FIGURE 2. **Gender Distribution of Respondents**

Figure 3 shows the place of residence for the majority of students was in Central Jordan (Balqa, Amman, Zarqa, Madaba) in a total of 63.9% of responses. Less students were from South Jordan (karak, Tafilah, Ma'an, Aqaba) in a percentage of 5.6%.

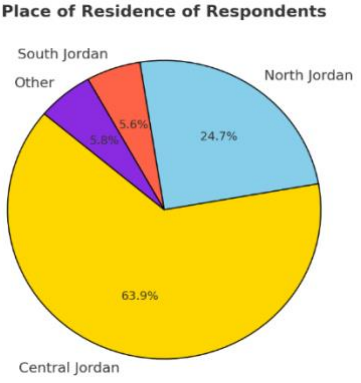

FIGURE 3. **Respondents Place of Residence**

Figure 4 shows that the questionnaire analysis also showed that the most of the students who responded were second year medical students (47.2%).

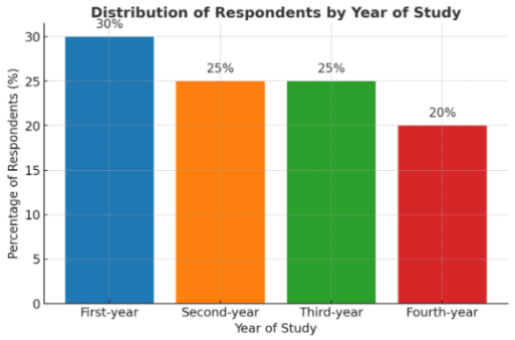

FIGURE 4. Distribution of Respondents by year of study

Most of the responders felt comfortable affording their internet payment (80.6%). Most of the responses scored 64 out of 100, which reflects a presence of a moderate level of internet addiction, as shown in figure 5 the chart shows that mild and moderate addiction levels are the most common among both males and females, while severe addiction is more prevalent in females.

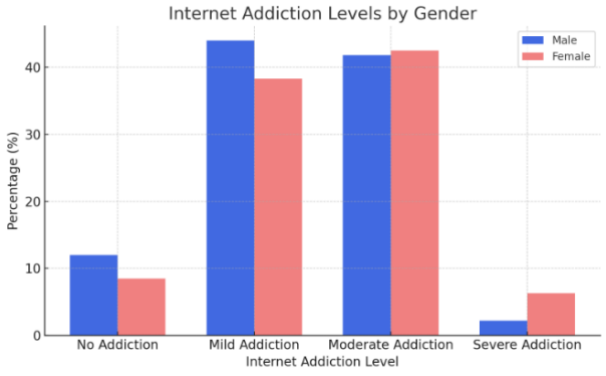

FIGURE 5. Internet Addiction Level by Gender.

Figure 6 shows the main location of using the internet was their home (85%), while other public places is (13.6%), and classrooms were the least locations for using the internet by the responders (1.4%).

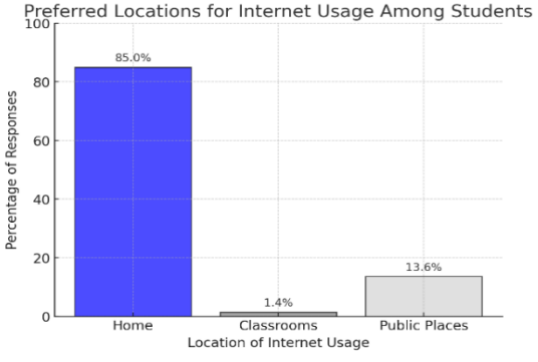

FIGURE 6. Preferred Locations for Internet Usage.

Most responses showed that the main time of using the internet was from evening to night (52.8%) and the minority was from afternoon to evening (13.8%). Figure 2 shows the main time of internet usage. Figure 7 shows the times of internet usage.

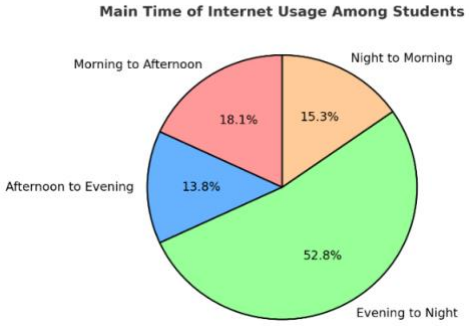

FIGURE 6. Main Time for Internet Usage.

Figure 8 shows that social media was the most where they spend the most time on the internet (74.2%). suddenly, web browsing was the least where they spent most of the time on the internet (3.6%).

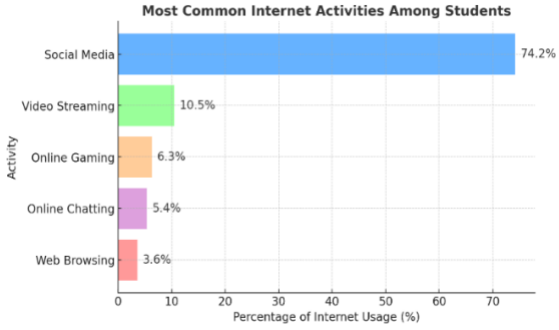

FIGURE 8. Most Common Internet Activities.

The most common response for average daily internet use age was between three to six hours, in a total of 51.4% of responses, as shown in figure 9.

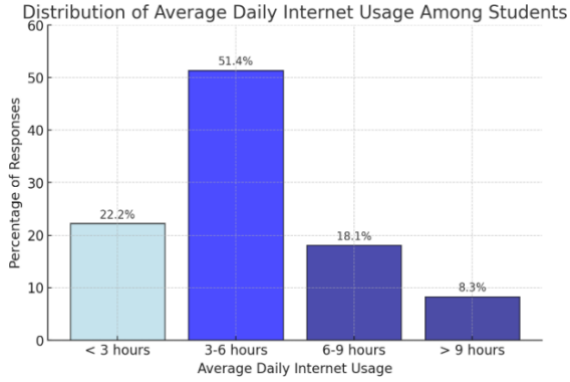

FIGURE 9. Average Daily Internet Usage.

V. DISCUSSION

The percentage of internet addiction among medical students is 43% (Moderate level of addiction). In comparison, a previous study revealed that 30.1% of 3651 medical students

were addicted to the internet [10]. A cross-sectional survey was assisted at Tehran University of Medical Sciences, including 174 medical students in their fourth to seventh years. A score above 50 on the Internet Addiction Test (IAT) was classified as addicted. The study showed that 28 students, or 16.9%, had an IAT over 50[11]. Moreover, the score which is indicated in our study shows that Jordan has a higher rate of Internet addiction among medical students than the rest of other countries which have done similar studies. The increased usage of the internet has been influenced by many factors, such as having unlimited access to the internet provided by universities, libraries and other public places. Which means, if a student has an uncontrolled addiction, they can finish their internet bundle earlier than a month and then they will try every time to buy a new bundle as soon as they can. Like these actions, can influence Internet addiction. A proper solution to have control over the internet bundle so it can stay for the whole month. This will not only have bad side effects on health, like tiredness and suffering from constant headaches. It can affect the economic side as well. Also, students have their own developmental needs which reflects a less control from the parents' side. From the academic side, after COVID-19 pandemic, students now prefer to study online rather than on campus. Higher rate of students who have been absent from lectures has risen. Being home and not attending lectures at campus, this will lead to unlimited internet access for some students who have unlimited internet access at home. On the social side, being a virtual mode of social interaction, and allowing to express a range of emotions are other features which the internet can provide and leads to addiction. Playing video games and other modes of games online has influenced the male population greatly. There are other studies confirming that males are more addict than females [13]. Our study also demonstrated that males have a higher rate of server internet addiction in a total of 6.3%, while females had 2.2% in total. Despite the widespread internet addiction worldwide, there is still a lack of evidence-based interventions. Although, pharmacological and non-pharmacological interventions have been studied and recommended for those in need. Talking on the clinical side, there should be caution when diagnosing internet addiction and they should provide therapies with benefits which are suitable for every individual case [28][29].

The findings of this study have important implications for educators, policymakers, and mental health professionals. The negative association between internet addiction and academic performance underscores the need for interventions that promote healthy internet use among students. Targeted programs for at-risk subgroups, such as male students and senior students, may be particularly effective. Additionally, integrating time management and digital literacy training into the curriculum could help students balance internet use with academic responsibilities

VI. CONCLUSION

The prevalence of internet addiction among medical students is notably high, with 43% classified at a moderate level of addiction. This highlights the urgent need for early intervention and preventive measures. Internet addiction has significant negative health impacts, particularly for students who primarily use the internet from night to morning, with 9% experiencing severe addiction. Staying up late has well-documented effects on health, including impaired behavioral, emotional, and attentional control, which are essential for academic success and social development. Moreover, chronic sleep deprivation has been linked to an increased risk of psychiatric disorders, high-risk behaviors, substance abuse, and automobile accidents. There is also strong evidence supporting the bi-directional relationship between sleep disturbances and emotional or behavioral dysregulation, further emphasizing the need for structured interventions to mitigate these risks among students.

Future research should explore intervention strategies to mitigate internet addiction among medical students, focusing on sleep hygiene awareness programs, time management strategies, and digital well-being initiatives. Longitudinal studies could assess the long-term impact of internet addiction on academic performance, mental health, and overall well-being. Additionally, investigating the role of institutional policies and support systems in reducing excessive internet use could provide valuable insights. Future studies may also consider cross-disciplinary approaches by integrating psychological, neurological, and behavioral perspectives to develop personalized intervention models for students at higher risk of severe addiction

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