ORIGINAL ARTICLE

Prevalence and Characterization of Internet Addiction among College Students at Sultan Qaboos University and its Association with Depression

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Abstract

Background: Internet addiction (IA) poses a growing concern among young people, adversely affecting their personal, academic, and professional lives.

Objective: This study aimed to assess the prevalence of IA and its correlates among college students at a major public university in Muscat, Oman. Furthermore, the study aimed to investigate the potential link between IA and depression within the surveyed population.

Methods: A cross-sectional study was conducted at Sultan Qaboos University (SQU) in Muscat, Oman. Data were collected using a multi-part, self-reported questionnaire. It was conducted from January 2023 until June 2024 Degree of IA severity was assessed using the 20-item Internet Addiction Test, while depression was screened using the 9-item Patient Health Questionnaire (PHQ-9).

Results: A total of 1,036 SQU students participated in the study, of which 67.7% were female. The mean age was 20.4 ± 1.7 years with range of 18-25 years. The overall prevalence of IA was 53.6%, with 40.3% exhibiting mild, 12.6% moderate, and 0.6% severe IA. While IA was more common among female students, no significant association was found between IA and any sociodemographic or academic variables. However, a significant association was observed between IA and depression, with 46.7% of students with IA displaying symptoms of depression compared to 18.7% without IA with (OR=4.028, 95% CI: 3.011-5.388, p<0.001)

Conclusion: This study revealed a notable prevalence of IA, with over half of all surveyed SQU college students exhibiting symptoms of internet addiction. Additionally, a significant association was found between IA and depression, underscoring the importance of addressing both IA and its associated psychological comorbidities for promoting student well-being.

Keywords: *Depression, students, university, young adults, surveys and questionnaires, prevalence, Oman.*

INTRODUCTION

The Internet is widely recognized as an invaluable tool across numerous domains, including business, education, culture, and governance [1]. Its rapid expansion over the last several decades has brought about fundamental transformations in human communication, education, and entertainment [1-3]. Despite its utility, improper usage of the Internet can cause various issues, including social isolation, cyberbullying, hindered neurological development, and addiction [4]. Internet addiction (IA) describes behavioral patterns characterized by excessive or compulsive online and offline computer use for diverse purposes, accompanied by diminished control over this use, resulting in psychological distress, impaired functioning and social relations, and a range of mental, behavioral, and physical symptoms [5, 6]. While the precise etiology of IA remains uncertain, the condition is likely the result of an accumulation of psychological and physical factors rather than a single underlying cause [6].

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Received: September 01, 2024; Revised: November 13, 2024; Accepted: December 11, 2024
DOI: https://doi.org/10.37184/lnjpc.2707-3521.7.34

Over the past two decades, people—particularly younger individuals—have shown a strong interest in the Internet compared to other age groups, with over 79% of those aged 15-24 worldwide using the Internet daily as of 2023 [7, 8]. In particular, college students emerge as one of the most substantial and frequent Internet user groups, dedicating an average of 2 hours to daily online activities [9, 10]. Notably, in certain regions, average daily Internet usage among college students has been found to surpass 4 hours [11]. Frequent usage of the Internet in this demographic group can be attributed to the heavy reliance of higher education institutions on online resources for research, coursework, communication, and administrative tasks. Additionally, college students often utilize the Internet for non-academic pursuits such as socializing, entertainment, shopping, and accessing various services.

Long-term use of computers or mobile devices can lead to physical and mental health issues [12, 13]. Specifically, IA is a significant public health problem that affects students' psychological well-being and academic performance [14, 15]. Excessive use of the Internet has been linked to social isolation and frequent psychiatric comorbidity, especially mood disorders, anxiety, impulse control, and substance abuse [16]. Multiple studies

have shown that IA is highly prevalent among college students and is associated with depression, anxiety, and stress [17, 20]. Some researchers suggest that the relationship between IA and poor mental health status is bidirectional, with each increasing the risk of onset of the other [21, 22].

The aim of this cross-sectional study was to determine the prevalence of IA and to explore the potential association between IA and depression within the sample. While prior research in Oman has predominantly focused on IA prevalence among medical student populations, this study aims to contribute new insights by focusing on a broader sample of college students [23, 24]. The findings from this research are expected to expand upon existing literature and shed light on the relationship between IA and depression as a correlated psychological comorbidity in university students.

METHODS

This cross-sectional study was conducted at Sultan Qaboos University (SQU), the largest public university in Oman. This study was conducted from January 2023 to June 2024, with ethical approval obtained from the Medical Research and Ethics Committee of the SQU College of Medicine and Health Sciences (Ref. No. SQU-EC/119/2023, MREC #3039). The target population consisted of all Omani students aged 18-25 years old enrolled in any of the SQU colleges. To mitigate confounding factors, students with prior diagnoses of Internet addiction, depressive disorders, known chronic medical conditions, or those currently on any medication were excluded from the analysis. This includes students under psychiatric follow-up for these conditions, as well as those with chronic illnesses, such as type 1 diabetes or thyroid disease, who are receiving ongoing treatment. The minimum required sample size for the study was calculated to be 377, considering the total SQU student population (~18,000) and using a 95% confidence level and 5% margin of error. However, to enhance the reliability of the findings, an additional 123 subjects were included beyond the calculated optimum sample size, resulting in a total necessary sample size of 500 students.

Data were collected using a multi-part, self-reported questionnaire administered through Google Forms, with a response rate of 100%. The first section assessed general demographic information, including each student's gender, age, grade point average (GPA), college, and residency status (living on campus, alone, or with family or friends). The second part of the questionnaire consisted of the Internet Addiction Test (IAT). Finally, to determine the association between IA and depression, the last section of the questionnaire consisted of the Patient Health Questionnaire-9 (PHQ-9).

Based on the criteria for pathological gambling and alcoholism in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V), the IAT is a reliable psychological tool to determine an individual's degree of addiction to the Internet and its impact on their daily activities, social life, productivity, sleeping patterns, and feelings [25]. The test includes 20 items rated on a five-point Likert scale from 1 (signifying 'not at all') to 5 (signifying 'always'). The degree of addiction is classified as either mild (total scores of 20-49, representing the average online user with full control over their usage), moderate (scores of 50-79, suggesting excessive usage resulting in occasional or frequent difficulties), or severe (scores of 80-100, indicating that the level of Internet usage is a direct cause of substantial problems or difficulties) [23]. Similarly, the PHQ-9 tool assesses nine depression symptoms based on the DSM-IV criteria [26]. Symptoms are rated on a 4-point scale, yielding total scores from 0 to 27. A total PHQ-9 score of 12 indicates depression in this study.

Data entry and analysis were performed using the Statistical Package for the Social Sciences (SPSS), Version 22.0 (IBM Corp., Armonk, NY). Descriptive statistics were calculated for sociodemographic characteristics. For categorical variables, frequencies and percentages were reported, while means and standard deviations were reported for continuous variables. Associations between independent and outcome variables were estimated using either Pearson's Chi-squared ($\chi 2$) test or Fisher's exact test (for cells <5). The odds ratios (OR) and 95% confidence intervals (CI) obtained from binary logistic regression models were taken as the measures of association between depression and selected socio-demographic predictors. The level of two-tailed significance was set at $P \leq 0.050$. Students were recruited from their colleges after providing written informed consent to participate in the study.

RESULTS

The questionnaire was completed by 1,036 SQU students in total out of 1300 students. The socio-demographic and academic characteristics of the participants are shown in Table **1** below. The mean age was 20.4 ± 1.7 years (range: 18 to 25 years old). Most students were female (67.7%) and single (98.0%) and the majority (53.7%) lived on campus. The sample included many medical and science students (20.9% and 20.6%, respectively). Just under half of the sample (43.4%) were in their third or fourth year of study. In terms of academic performance, most students (51.4%) had a GPA of between two and three.

Table 1: Sociodemographic characteristics of students attending Sultan Qaboos University, Muscat, Oman (N = 1,036).

Characteristic	n (%)
Age (mean ± SD)	20.4 ± 1.7
Gender	
Female	701 (67.7)
Male	335 (32.3)
Residency status	
Alone	35 (3.4)

Characteristic	n (%)
On campus	556 (53.7)
With family	257 (24.8)
With friends	188 (18.1)
Marital status	
Single	1,015 (98.0)
Married	20 (1.9)
Divorced	1 (0.1)
Widowed	0 (0)
GPA	
<2	74 (7.1)
2-3	532 (51.4)
>3	430 (41.5)
Academic year	
1-2	338 (32.6)
3-4	450 (43.4)
≥5	248 (23.9)
College	
Agriculture and Marine Sciences	76 (7.3)
Arts and Social Sciences	99 (9.6)
Economics and Political Science	70 (6.8)
Education	153 (14.8)
Engineering	96 (9.3)
Law	41 (4.0)
Medicine and Health Sciences	217 (20.9)
Nursing	71 (6.9)
Science	213 (20.6)

Abbreviations: SD, standard deviation; GPA, grade point average.

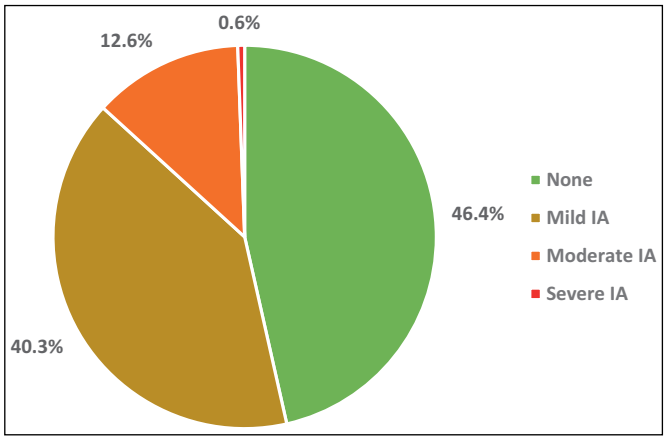

Fig. (1): Severity of internet addiction among students attending Sultan Qaboos University, Muscat, Oman (N = 1,036).
Abbreviations: IA, Internet addiction.

Fig. **(1)** presents the frequency of IA in the sample. The overall prevalence of IA among the students was 53.6%, with 40.3%, 12.6%, and 0.6% of students exhibiting mild, moderate, and severe IA, respectively. Although most students with IA were female rather than male (65.8% *vs.* 34.2%), there was no significant association between IA and sex (P = 0.161). Similarly, no associations were observed between IA and any other sociodemographic or academic characteristics, as shown in Table **2**.

With regards to the connection between IA and depression, the majority (56.9%) of students without IA showed no symptoms of depression. Conversely, 74.2%

Table 2: Associations between internet addition and selected demographic and academic characteristics among students attending Sultan Qaboos University, Muscat, Oman (N = 1,036).

Characteristic	n (%)		p-value
	Students with IA (n = 555)	Students without IA (n = 481)	
Age (mean ± SD)	20.5 ±1.69	20.4 ±1.71	0.087
Gender			
Female	365 (65.8)	336 (69.9)	0.161
Male	190 (34.2)	145 (30.1)	
Residency status			
Alone	19 (3.4)	16 (3.3)	0.186
On campus	283 (51.0)	273 (56.8)	
With family	152 (27.4)	105 (21.8)	
With friends	101 (18.2)	87 (18.1)	
Marital status			
Single	543 (97.8)	472 (98.1)	0.642
Married	11 (2.0)	9 (1.9)	
Divorced	1 (0.2)	0 (0.0)	
Widowed	0 (0.0)	0 (0.0)	
GPA			
<2	45 (8.1)	29 (6.0)	0.378
2-3	286 (51.5)	246 (51.1)	
>3	224 (40.4)	206 (42.8)	
Academic year			
1-2	176 (31.7)	162 (33.7)	0.744
3-4	242 (43.6)	208 (43.2)	
≥5	137 (24.7)	111 (23.1)	
College			
Agriculture and Marine Sciences	47 (8.5)	29 (6.0)	0.144
Arts and Social Sciences	51 (9.2)	48 (10.0)	
Economics and Political Science	44 (7.9)	26 (5.4)	
Education	84 (15.1)	69 (14.3)	
Engineering	54 (9.7)	42 (8.7)	
Law	20 (3.6)	21 (4.4)	
Medicine and Health Sciences	102 (18.4)	115 (23.9)	
Nursing	71 (6.9%)	32 (5.8%)	
Science	213 (20.6%)	121 (21.8%)	
Depression			
With depression	259 (74.2%)	90 (25.8%)	<0.001
Without depression	296 (43.1%)	391 (56.9%)	

Abbreviations: SD, standard deviation; GPA, grade point average.

of students who had IA also displayed symptoms of depression, as shown in Fig. **(2)**. There was a significant association between IA and depression in the sample (p <0.001).

The regression model showed that depression, and being in the College of Economics and Political Science are two independent predictors of internet addiction in college students. Students who have depression have four times increased risk for internet addiction compared to those who do not have depression (OR= 4.028, 95% CI= 3.011-5.388, P<0.001). Students in the College of Economics and Political Science have an 85.5% increased risk for internet addiction compared to students in the College of Medicine and Health Sciences (OR= 1.855, 95% CI: 1.041-3.306, p=0.036) (**Table 3**).

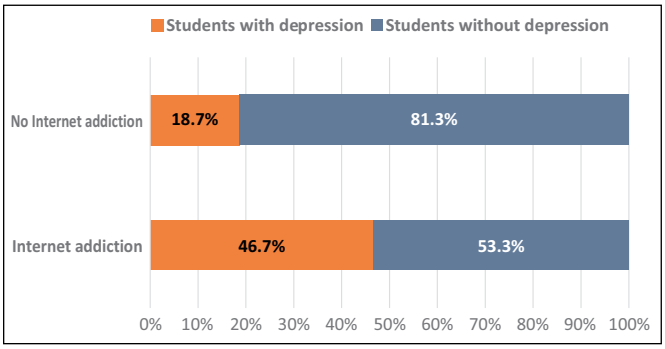

Fig. (2): Frequency of internet addiction and depression among students attending Sultan Qaboos University, Muscat, Oman (N = 1,036).

Table 3: Multivariate binary logistic regression analysis to determine the independent predictors of internet addiction in college students.

Variable	Odds Ratio (OR)	95% CI for OR		p-value
		Lower	Upper	
Gender				
Female (Reference)	1.000			
Male	1.373	0.850	2.220	0.195
Current place of residence				
In the campus	1.000			
Alone	1.059	0.458	2.445	0.894
With friends	0.958	0.540	1.698	0.882
With family	1.465	1.000	2.147	0.050
College				
College of medicine and health sciences	1.000			
College of agriculture and marine science	1.713	0.976	3.005	0.061
College of arts and social science	1.218	0.733	2.025	0.446
College of economics and political science	1.855	1.041	3.306	0.036*
College of Education	1.359	0.875	2.111	0.173
College of engineering	1.114	0.664	1.866	0.683
College of law	1.041	0.516	2.102	0.910
College of science	1.318	0.879	1.976	0.181
College of nursing	0.851	0.476	1.524	0.588
Depression				
No	1.000			
Yes	4.028	3.011	5.388	<0.001*

*Statistically significant at p<0.05, PAC = 64.0%, Nagelkerke R square = 0.140.

DISCUSSION

Overall, younger individuals tend to be more susceptible to IA, with various psychological and environmental factors contributing to the risk of addiction [27]. Elevated prevalence rates of IA in college students could potentially stem from factors such as increased communication opportunities, unstructured leisure time, dependence on online academic resources, or utilization of the Internet as a means of alleviating the pressures and strains associated with university life [19]. Moreover, the purpose of Internet usage plays a significant role, with students showing increased susceptibility to Internet addiction (IA) when engaging in social media activities as opposed to academic pursuits. Sgery *et al.* also, highlight that students are more prone to IA when using the Internet for leisure, such as social media, rather than for academic activities [19].

The prevalence and correlates of IA vary considerably across studies and in different regions. In the present study, the prevalence of IA among SQU students in Oman was 53.6%, with 0.6% exhibiting severe IA. Conversely, in Iran, only 14.3% of students enrolled at Gonabad Universities were addicted, although the researchers noted that 33.9% were at risk of addiction [28]. Similarly, in Saudi Arabia, only 12.4% of medical students enrolled at Qassim University suffered from IA [29]. In contrast, studies from Iraq reported high IA prevalence rates of 68.7% and 74.8% among university students, respectively, with 10.2% and 0% demonstrating severe IA [19, 27]. Studies from India similarly reported high IA prevalence rates of 54% and 78.7%, respectively, with 11% and <0.1% having severe IA [18, 30]. In Ethiopia, the rate of IA was 85% among undergraduate students at Wollo University [21].

In our study, although most individuals with IA were female, no significant correlation was found between IA and sex. This lack of statistical significance extended to other demographic and academic variables such as age, marital status, college, and GPA. Similar findings were observed in a study conducted among students at Gonabad universities in Iran, where no significant correlations were found between IA prevalence and gender, marital status, or academic field; however, significant associations were noted with age, education level, place of residence, and university [28]. Conversely, studies among medical students in Iraq reported no correlation between IA and age or gender, yet other research from Iraq and India found a higher prevalence of IA among males [18, 19, 27]. Interestingly, at Qassim University in Saudi Arabia, female medical students exhibited higher Internet usage than males [29]. Additionally, factors such as inadequate sleep and late-night Internet use have also been observed to increase the risk of IA among college students [27].

Disparities in findings across these studies may be attributed to various factors. Firstly, differences in study populations, societal norms, and cultural attitudes towards Internet usage can significantly impact the prevalence of IA. Secondly, variations in research methodologies, including measurement tools and criteria for defining addiction, may contribute to conflicting outcomes [31]. Additionally, social determinants such as socioeconomic status, educational attainment, and technological access can influence Internet usage patterns and addiction prevalence. Given the intricate interplay of these factors, further investigation is warranted to comprehensively understand the nuances of IA and its manifestation across diverse demographic groups.

Among the surveyed students at SQU, those with IA exhibited a significantly higher prevalence of depression

symptoms compared to those without IA, indicating a strong correlation between IA and depression ($p < 0.001$). This finding aligns with previous research among medical students in Iraq, as well as studies conducted in India and Egypt, all of which found a positive correlation between IA and depressive features [18, 20]. Additionally, Ethiopian students experiencing mental distress were more likely to demonstrate higher levels of IA, potentially explained by maladaptive social and psychological characteristics such as social isolation, reduced self-esteem, and coping mechanisms involving excessive Internet use [21]. While the precise relationship between IA and psychological issues remains uncertain, further cohort studies are needed to elucidate whether IA exacerbates conditions like depression, anxiety, and stress, or if excessive use of the Internet is utilized as a coping mechanism by individuals with pre-existing mental distress.

LIMITATIONS AND RECOMMENDATIONS

The actual prevalence of IA may have been overestimated due to the self-reported nature of the data collection tools, potentially leading to recall bias and symptom overreporting. Moreover, while the IAT is a well-known and validated screening tool, the test results should be complemented with clinical evaluation for accurate diagnosis and management [25]. Additionally, the cross-sectional design of this study can only provide a snapshot of the prevalence of IA in the sample at a specific point in time, highlighting the need for longitudinal studies to capture changes over time. Future research could delve deeper into factors contributing to IA among SQU students, including their social media usage, stress, and psychological well-being. Longitudinal designs, qualitative analyses of student experiences, and evaluations of intervention effectiveness could enhance our understanding of this issue and guide the development of support plans for students suffering from IA.

CONCLUSION

A notable proportion of students at SQU were found to be affected by IA, with 53.6% of surveyed students exhibiting symptoms of addiction, posing a significant concern for their academic success and mental health. The distribution of severity levels—ranging from mild (40.3%) to severe (0.6%)—underscores the diverse impact of IA on students' behaviors, from manageable to potentially detrimental patterns. Given the observed association between IA and depression, educational institutions should prioritize mental health support services and interventions to address both IA and its associated psychological comorbidities, fostering a healthier academic environment. Providing counseling services and promoting responsible technology use are essential steps in assisting students, particularly those with severe IA, in overcoming this challenge. Policymakers can support these efforts by allocating funding for comprehensive mental health programs, establishing guidelines for technology use within educational settings, and integrating IA awareness into national education policies. Additionally, policymakers should collaborate with educators and health professionals to implement school-wide initiatives that promote digital literacy, emphasize balanced technology use, and provide resources for early detection and intervention. These measures collectively aim to mitigate the psychological and academic consequences of IA while ensuring the well-being of students.

ETHICS APPROVAL

Ethical approval of this study was obtained from the Medical Research and Ethics Committee of the SQU College of Medicine and Health Sciences (Ref. No. SQU-EC/119/2023, MREC #3039). All procedures performed in studies involving human participants followed the ethical standards of the institutional and/ or national research committee and the Helsinki Declaration.

CONSENT FOR PUBLICATION

Students have provided written informed consent.

AVAILABILITY OF DATA

The data that support the findings of this study are available on request from the corresponding author.

FUNDING

No funding was received for this study.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

The authors would like to thank all of the participants who volunteered in this study, as well as Sultan Qaboos University who gave their valuable time for this endeavor.

AUTHORS' CONTRIBUTION

Asma Al Salmani was involved in question formulation, methodology, data cleaning and writing, submitting and revising the manuscript. Nouf Al Alawi was involved in question formulation, designing the methodology and revising the manuscript. Roaa Al Bahri and Shahd Al Khamisi contributed to data collection, data analysis and manuscript writing.

REFERENCES

1. Hoffman DL, Novak TP, Venkatesh A. Has the Internet become indispensable? Commun ACM 2004; 47(7): 37-42. DOI: https://doi.org/10.1145/1005817.1005818
2. Bargh JA, McKenna KY. The Internet and social life. Annu Rev Psychol 2004; 55: 573-90. DOI: https://doi.org/10.1146/annurev.psych.55.090902.141922
3. Pedrouzo SB, Krynski L. Hyperconnected: Children and adolescents on social media. The TikTok phenomenon. Arch Argent Pediatr 2023; 121(4): e202202674. DOI: https://doi.org/10.5546/aap.2022-02674.eng
4. Small GW, Lee J, Kaufman A, Jalil J, Siddarth P, Gaddipati H, *et al.* Brain health consequences of digital technology use. Dialogues

Clin Neurosci 2020; 22(2): 179-87.
DOI: https://doi.org/10.31887/DCNS.2020.22.2/gsmall

5. Cash H, Rae CD, Steel AH, Winkler A. Internet addiction: a brief summary of research and practice. Curr Psychiatry Rev 2012; 8(4): 292-8.
DOI: https://doi.org/10.2174/157340012803520513
6. Shaw M, Black DW. Internet addiction: definition, assessment, epidemiology and clinical management. CNS Drugs 2008; 22(5): 353-65.
DOI: https://doi.org/10.2165/00023210-200822050-00001
7. International Telecommunication Union. Youth Internet use: young people more connected than the rest of the population [Internet]. Geneva: International Telecommunication Union, United Nations; 2021 [cited 2024 Apr 24]. Available from: https://www.itu.int/itu-d/reports/statistics/2021/11/15/youth-internet-use/
8. Statista. Age distribution of internet users worldwide as of 2023, by region [Internet]. Hamburg: Statista; 2024 [cited 2024 Apr 25]. Available from: https://www.statista.com/statistics/209101/age-distribution-internet-users-worldwide-by-region/
9. Anderson KJ. Internet use among college students: an exploratory study. J Am Coll Health 2001; 50(1): 21-6.
DOI: https://doi.org/10.1080/07448480109595707
10. Zhou R, Xia D, Yin Y, Zhang J, Zhang W, Fen J. Analyzing the impact of the Internet on higher education. Int J Secur Appl 2016; 10(6): 341-50.
DOI: https://doi.org/10.14257/ijsia.2016.10.6.32
11. Ayub AF, Hamid WH, Nawawi MH. Use of Internet for academic purposes among students in Malaysian institutions of higher education. Turkish Online J Educ Technol 2014; 13(1): 232-41.
12. Nakshine VS, Thute P, Khatib MN, Sarkar B. Increased screen time as a cause of declining physical, psychological health, and sleep patterns: a literary review. Cureus 2022; 14(10): e30051.
DOI: https://doi.org/10.7759/cureus.30051
13. Wacks Y, Weinstein AM. Excessive smartphone use is associated with health problems in adolescents and young adults. Front Psychiatry 2021; 12: 669042.
DOI: https://doi.org/10.3389/fpsyt.2021.669042
14. Ali I, Kalsoom O, Kazmi SA, Munir TA, Qayyum Z, Akhter N, *et al*. Effect of Internet addiction on academic performance and mental health of medical students. J Bahria Univ Med Dent Coll 2019; 9(1): 48-52.
DOI: https://doi.org/10.51985/JBUMDC2018063
15. Javaeed A, Jeelani R, Gulab S, Ghauri SK. Relationship between Internet addiction and academic performance of undergraduate medical students of Azad Kashmir. Pak J Med Sci 2020; 36(2): 229-33.
DOI: https://doi.org/10.12669/pjms.36.2.1061
16. Bozkurt H, Coskun M, Ayaydin H, Adak İ, Zoroglu SS. Prevalence and patterns of psychiatric disorders in referred adolescents with internet addiction. Psychiatry Clin Neurosci 2013; 67(5): 352-9.
DOI: https://doi.org/10.1111/pcn.12065
17. Ibrahem RA, Shalaby AS, Hegazy NN. Internet addiction in relation to mental health among medical students, Menoufia University, Egypt. Egypt J Hosp Med 2022; 88(1): 2325-31.
DOI: https://doi.org/10.21608/ejhm.2022.235956
18. Kumari R, Langer B, Gupta R, Gupta RK, Mir MT, Shafi B, *et al*. Prevalence and determinants of Internet addiction among the students of professional colleges in the Jammu region. J Family Med Prim Care 2022; 11(1): 325-9.
DOI: https://doi.org/10.4103/jfmpc.jfmpc_991_21
19. Sgery AS, Yaseen YA, Husam-Aldin MM, Sulaiman SN, Tahir LB. Internet addiction and its relation to stress and depression among Duhok Medical College students. Duhok Med J 2021; 15(2): 1-12.
DOI: https://doi.org/10.31386/dmj.2021.15.2.1
20. Sayed M, Naiim CM, Aboelsaad M, Ibrahim MK. Internet addiction and relationships with depression, anxiety, stress and academic performance among Egypt pharmacy students: a cross-sectional designed study. BMC Public Health 2022; 22(1): 1826.
DOI: https://doi.org/10.1186/s12889-022-14140-6
21. Zenebe Y, Kunno K, Mekonnen M, Bewuket A, Birkie M, Necho M, *et al*. Prevalence and associated factors of Internet addiction among undergraduate university students in Ethiopia: a community university-based cross-sectional study. BMC Psychol 2021; 9(1): 4.|
DOI: https://doi.org/10.1186/s40359-020-00508-z
22. Otsuka Y, Kaneita Y, Itani O, Tokiya M. Relationship between Internet addiction and poor mental health among Japanese adolescents. Iran J Public Health 2020; 49(11): 2069-77.
DOI: https://doi.org/10.18502/ijph.v49i11.4722
23. Al Mukhaini AM, Al Houqani FA, Al Kindi RM. Internet addiction and depression among postgraduate residents: A cross-sectional survey. Sultan Qaboos Univ Med J 2021; 21(3): 408-15.
DOI: https://doi.org/10.18295/squmj.4.2021.008
24. Masters K. Social networking addiction among health sciences students in Oman. Sultan Qaboos Univ Med J 2015; 15(3): e357-63.
DOI: https://doi.org/10.18295/squmj.2015.15.03.009
25. Widyanto L, McMurran M. The psychometric properties of the internet addiction test. Cyberpsychol Behav 2004; 7(4): 443-50.
DOI: https://doi.org/10.1089/cpb.2004.7.443
26. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. J Gen Intern Med 2001; 16(9): 606-13.
DOI: https://doi.org/10.1046/j.1525-1497.2001.016009606.x
27. Abduallah HH, Obaid SS, Salman BI, Abutiheen AA. Prevalence and possible attributes of Internet addiction disorder among students of University of Kerbala. Karbala J Med 2021; 14(1): 2456-66.
28. Safarzade S, Dehghani Y. The prevalence of internet addiction and its relation with demographic factors among the students of Gonabad Universities. J Res Health 2022; 12(6): 389-96.
DOI: https://doi.org/10.32598/JRH.12.6.1036.5
29. Taha MH, Shehzad K, Alamro AS, Wadi M. Internet use and addiction among medical students in Qassim University, Saudi Arabia. Sultan Qaboos Univ Med J 2019; 19(2): e142-7.
DOI: https://doi.org/10.18295/squmj.2019.19.02.010
30. Kumari M, Kaur N, Chahil NK, Kaur N, Kaur P, Kaur P. Descriptive study to assess the prevalence and effects of Internet addiction among undergraduates. Baba Farid Univ Nurs J 2015; 8(1): 58.
31. Kuss DJ, Lopez-Fernandez O. Internet addiction and problematic internet use: A systematic review of clinical research. World J Psychiatry 2016; 6(1): 143-76.
DOI: https://doi.org/10.5498/wjp.v6.i1.143