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# A study of internet addiction and its effects on mental health: A study based on Iranian University Students

Javad Yoosefi Lebni<sup>1</sup>, Razie Toghrolif<sup>2</sup>, Jaffar Abbas<sup>3</sup>, Nazila NeJhaddadgar<sup>4</sup>, Mohammad Reza Salahshoor<sup>5</sup>, Morteza Mansourian<sup>6</sup>, Hadi Darvishi Gilan<sup>1</sup>, Neda Kianipour<sup>7</sup>, Fakhreddin Chaboksavar<sup>1</sup>, Seyyed Amar Azizi<sup>7</sup>, Arash Ziapour<sup>1</sup>

<sup>1</sup>Health Education and Health Promotion, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran, <sup>2</sup>Social Determinants in Health Promotion Research Center, Hormozgan Health Institute, Hormozgan University of Medical Sciences, Bandar Abbas, Iran, <sup>3</sup>Antai College of Economics and Management/School of Media and Communication, Shanghai Jiao Tong University, Shanghai-China, <sup>4</sup>Department of Health Care Services and Health Education, School of Health, Ardabil University of Medical Science, Ardabil, Iran, <sup>5</sup>Department of Anatomical Sciences, Medical School, Kermanshah University of Medical Sciences, Kermanshah, Iran, <sup>6</sup>Health Management and Economics Research Center, Iran University of Medical Sciences, Tehran, Iran, <sup>7</sup>Students Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran

**Address for correspondence:**

Dr. Arash Ziapour,  
Health Education and Health Promotion,  
Health Institute,  
Kermanshah University of Medical Sciences,  
Kermanshah, Iran.  
E-mail: arashziapoor@gmail.com

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**Abstract:**

**INTRODUCTION:** The Internet has drastically affected human behavior, and it has positive and negative effects; however, its excessive usage exposes users to internet addiction. The diagnosis of students' mental dysfunction is vital to monitor their academic progress and success by preventing this technology through proper handling of the usage addiction.

**MATERIALS AND METHODS:** This descriptive-analytical study selected 447 students (232 females and 215 males) of the first and second semesters enrolled at Kermanshah University of Medical Sciences, Iran, in 2018 by using Cochran's sample size formula and stratified random sampling. The study applied Young's Internet Addiction Test and Goldberg General Health Questionnaire 28 for data collection. The study screened the data received and analyzed valid data set through the t-test and Pearson's correlation coefficient by incorporating SPSS Statistics software version 23.0.

**RESULTS:** The results of the current study specified that the total mean score of the students for internet addiction and mental health was  $3.81 \pm 0.88$  and  $2.56 \pm 0.33$ , correspondingly. The results revealed that internet addiction positively correlated with depression and mental health, which indicated a negative relationship ( $P > 0.001$ ). The multiple regression analysis results showed students' five significant vulnerability predictors toward internet addiction, such as the critical reason for using the Internet, faculty, depression, the central place for using the Internet, and somatic symptoms.

**CONCLUSIONS:** The study findings specified that students' excessive internet usage leads to anxiety, depression, and adverse mental health, which affect their academic performance. Monitoring and controlling students' internet addiction through informative sessions on how to use the Internet adequately is useful.

**Keywords:**

Internet addiction, medical sciences, mental health, students, technology advancement

## Introduction

In recent years, technological advancements have taken place in the modern world. In the complexity of today's world, internet use is playing a vital role in educational institutions to attain different learning skills, which have become a necessity for university students. However, scholars have shown

concerns about the excessive use of this technology and the hidden risk factors of internet users, such as physical and mental health.<sup>[1,2]</sup> The Internet is an easy and quick medium of interaction to gain the required information for communication with others around the world. However, a lack of control over excessive internet use can disturb individuals' living standards and relationships between family members, and it can bring instability of feelings.<sup>[3,4]</sup>

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The users of the Internet have increased incredibly worldwide, with the peak of a digital industrial revolution in progress, and new technological revolution will undoubtedly create new problems and predicaments.<sup>[4,5]</sup> The history of internet users goes back some decades at present. The Internet has become one of the most fast-growing and transformative technologies. Globally, the users of the Internet have increased from 414 million in 2000, 665 million in 2002, and over 4.574 billion by December 31, 2019. The US National Science Foundation specified that the internet users enabled by smartphones access would increase to 5 billion in 2020.<sup>[6,7]</sup> In recent years, internet users in Iran have grown dramatically. According to the reported statistics, the Iranian users of the internet have risen from 11.0 million in 2006, 33.0 million in 2002, and over 62 million by July 1, 2019. Hence, the users of the Internet in Iran have increased drastically over 25 times, and recent research conducted in Iran indicated that the young population makes up the majority of internet users.<sup>[8]</sup> Previous research specified that the Iranian users devote 35% of their time to chat rooms, 28% to online games, 30% to checking E-mails, and 25% to surfing the net on averages, while connected to the Internet. Besides, another study reported that Iranian users spend 52 min/week as an average time, while linked to the Internet.<sup>[9]</sup>

Internet addiction disorder, pathological internet use, or problematic internet use typically refers to the questionable or compulsive use of the Internet, which results in substantial impairment in the function of individuals in their different life domains over prolonged time. Internet addiction and other relationships based on the usage of digital media and mental health are vital considerable research fields, arguments, and discussions among numerous experts and researchers in various disciplines. This addictive behavior has made controversy from the areas of scientific, medical, and technological communities. Internet addiction is an interdisciplinary phenomenon, and different researchers have investigated it from different perspectives from various disciplines, such as medicine, computer science, sociology, law, and psychology.<sup>[10]</sup> Some scholars have considered internet addiction as a social crisis, and it has attracted the attention of different researchers and experts. This phenomenon is a biological, psychological, social, economic, and cultural problem, which is impossible to be taken into account as a simple matter because different factors influence it.<sup>[11]</sup> The excessive and pathological use of the Internet refers to internet addiction.<sup>[6]</sup> Therefore, with the growing number of internet users and its widespread psychological and sociological implications, it is necessary to determine and recognize the contribution of predictive factors

in internet addiction. By conducting pathological studies about internet addiction to judge the addictive behaviors, it would enable us to utilize this technology with a balanced approach better and more usefully.<sup>[12]</sup> Internet addiction generally refers to a type of applying the Internet, which leads to psychological, social, educational, or occupational problems in a person's life.<sup>[13,14]</sup> Scholars have described this phenomenon as internet addiction dysfunction<sup>[15]</sup> and the problematic application of the Internet,<sup>[16]</sup> or habitual use of the Internet,<sup>[17]</sup> which determines it as one of the forms of behavioral addiction.<sup>[18]</sup> Researchers have also described internet addiction as "the modern addiction." In practice, this type of addiction is true dependency, like drug addiction and other kinds of dependency. Although this kind of dependency does not have the somatic problems of chemical addiction, its resultant social problems are like other types of addiction.<sup>[1]</sup> In the 2015 World Statistics report, the number of internet users and the population of countries were specified; it was reported that the total world population was 7,264,623,793, of which 3,079,339,857 were using the Internet, and the young made up the majority of users.<sup>[8]</sup> While taking into account many points of proper and practical use of the Internet and prevention of mental illness, these reported statistics underscore the importance of the Internet and social networks. Internet addiction is an etymological process of using the Internet that creates a psychological state in which the user's behavior is disturbed, thereby leading to a dysfunction in his/her cognitive status.<sup>[19]</sup> Mental health is one of the main pillars of healthy human societies, which plays a vital role in ensuring the dynamism and efficiency of any society. As university students are among the most prestigious layers of societies, they present future builders in any country, and newly arrived students in universities from far-away cities are the first who fall victim to internet addiction. The mental health of the students is essential for raising their learning and scientific awareness.<sup>[19]</sup> Mental health is a concept that reflects our thinking, feelings, and functioning in dealing with various life situations.<sup>[20]</sup> In this modern world, the disease patterns are shifting toward non-communicable diseases, and the rising rate of mental dysfunction and the resultant costs imposed on societies have attracted the attention of health promotion specialists.<sup>[8]</sup> In this regard, the Global Burden of Disease statistics has introduced mental illnesses as one of the three primary causes of lost years of life due to disability.<sup>[21]</sup> According to the WHO, mental health is defined as one's ability to communicate with others harmoniously; modify the personal and social environment; and resolve conflicts and personal preferences logically, fairly, and appropriately.<sup>[22]</sup> Besides, the statistics announced by the WHO reported that 52 million people of different age groups suffer

from severe illnesses worldwide and 250 million have mild mental dysfunction. In Iran, these statistics are not lower than those in other countries.<sup>[23]</sup> The results of the epidemiological studies conducted to examine psychiatric dysfunction in Iran are indicative of the variability of the prevalence of dysfunction between 11.9% and 30.2%.<sup>[24,25]</sup>

Concerning internet addiction, addressing the problems of individuals' mental health is of great importance. An earlier study conducted by Fallah reported that depression was more prevailing among internet users with addictive behavior as compared with average internet users. The finding specified that individuals having internet addiction showed anxious behavior and their mental health was more exposed to higher risks.<sup>[23]</sup> Lashgarara *et al.* described that 34% of university students had addictive behavior to the Internet based on the Young's categorization.<sup>[26]</sup>

In a previous study, Fonia *et al.* reported that students' mental health and internet addiction showed a negative relationship, and their internet addictive behavior was not significant. It was different from the students' gender and marital status variables.<sup>[27]</sup> Another study of Nastizai claimed that students' internet addiction developed a higher risk of mental health than ordinary users of the Internet.<sup>[28]</sup> Fonia *et al.* reported that there was a significant difference between internet addiction among male and female students.<sup>[27]</sup> Similarly, the relationship between internet addiction and users' mental health received more considerable attention, and previous studies have emphasized this matter, such as the investigations of Fallah Mehneh,<sup>[29]</sup> Alavi *et al.*,<sup>[30]</sup> Mirzaian *et al.*,<sup>[31]</sup> and Taheri Mobarakeh *et al.*<sup>[32]</sup> The tendency of using the Internet among students is higher, and they are more vulnerable to the risk of internet addiction. Thus, more attention to students' mental health needs should be considerable paid for their future as well as the development of the nation.<sup>[22,25]</sup> Universities need to pay attention to boosting students' mental health, personal growth, and well-being. Because internet addiction prevails worldwide, it also exists in Iran for several years, and young individuals have shown greater engagement toward internet use, while students make up the majority of internet users. The excessive use of the Internet leads to psychological injury, mental health damage, and other health problems. Experts have suggested necessary measures to prevent internet addiction among students and treat disorders and health problems where appropriate.<sup>[33]</sup> The present research emphasized investigating internet addiction and its effects on the mental health of medical students at Kermanshah University of Medical Sciences, and its findings provide valuable insights.

## Materials and Methods

This descriptive-analytical study selected 447 students (232 females and 215 males) of the first and second semesters enrolled at Kermanshah University of Medical Sciences, in 2018 (May 2017–October 2018) by applying Cochran's sample size formula and stratified random sampling methods. This method draws the statistical population according to the hierarchy of the types of population units. The study applied Young's Internet Addiction Test (IAT) and Goldberg General Health Questionnaire (GHQ-28) for data collection. The study screened the data received and analyzed valid data set through the *t*-test and Pearson's correlation coefficient by incorporating SPSS Statistics software version 24.0. Hence, the authors randomly selected nine faculties (medicine, dentistry, pharmaceutical medicine, nursing and midwifery, paramedics, public health, nutrition sciences, and food industries, and self-governing college). In the next step, we selected majors and classes from each faculty (as many as the number of research samples) and evaluated the data. The inclusion criterion was the right to choose the courses freely, and the investigators have excluded incomplete questionnaires from the study. Besides, we assured participants about the confidentiality of the collected information and lack of disclosure of their personal information. Besides, the ethical principles employed in the present study included critical steps, such as obtaining the necessary permits, retaining the right for the schools under investigation to either accept or reject to participate in the research study, and ensuring confidentiality and nondisclosure of agreement. The investigators distributed the questionnaires among the target respondents. The authors explained the objectives of the present study to the target individuals and obtained informed consent from all participants before to execute the research. Not to mention, the exclusion criteria were the sample's disinterest in participating in the study and handing over incomplete questionnaires.

### Demographic questionnaire

The first section of the self-administered instrument contained the demographics and comprised questions on gender, age, marital status, place of residence, faculty, education, having a personal computer, central location, and time of using the Internet, and the primary reason for using the Internet.

### Tools

#### *Internet Addiction Test*

Young developed this 20-item scale for measuring the internet addiction, which affects a variety of aspects in users' lives.<sup>[17]</sup> The study applied the Persian translation of Young's IAT developed by Alavi *et al.*<sup>[30]</sup> The questions showed the scores on a selected 5-point



Likert scale (5 = always, 4 = usually, 3 = most of the time, 2 = sometimes, and 1 = seldom). The ranges of minimum and maximum scores showed 20–100. The scores divided internet users into the following three groups: typical users indicating a score of 20–49; at-risk users, specifying a score of 50–79; and the internet users having an addiction with a score of 80–100. The highest scores represent the highest levels of students' dependency on the Internet, which leads to addictive behavior. Recent studies evidenced that a score of 50 or above shows internet addiction. Besides, this study confirmed the questionnaire's validity from three experts by applying the content validity index (0.84), while the survey confirmed reliability through the *t*-test (0.88). The Cronbach's alpha provided a satisfactory value (0.87) with a sample of twenty medical students within 2-week process of data collection. The findings of the reliability and validity of this instrument/tool are consistent with the results of previous studies, which indicated over 90%.<sup>[34-38]</sup>

### The General Health Questionnaire

This prospective study used GHQ-28 for gathering data.<sup>[39]</sup> The study screened the data received and analyzed valid data set through the *t*-test and Pearson's correlation coefficient by using the SPSS Statistics software version 24.0. The self-reported Goldberg's 28-item questionnaire examines the individual's mental health in the recent month and includes symptoms such as abnormal thoughts and feelings and aspects of visible behavior. This questionnaire consists of the following four subscales: somatic symptoms (questions 1–7), anxiety (questions 8–14), social dysfunction (questions 15–21), and depression (questions 22–28). Each subscale contains seven questions that measure the various aspects of mental health, ranging from somatic to psychological dysfunction.<sup>[39]</sup> The questions presented scores with a 4-point Likert scale (0 = not at all, 1 = average, 2 = more than average, and 3 = far more than average). The minimum and maximum ranges illustrated 0–84, which showed categories into four levels of mental health, for instance, normal (0–22), weak (21–40), balanced (41–60), and severe (61–84). The highest ratings/scores represented the lowest level of students' mental health status. The study examined and confirmed the questionnaire's reliability for each section by using content validity (0.80). The sought the opinion from three experts by using the content validity index (0.80) and confirmed reliability through several tests, such as test-retest (0.87). The study calculated the Cronbach's alpha (0.93) value from the sample of twenty medical students. The results derived from the tests of reliability and validity of this instrument are in line with the findings of previous global studies, which specified the same results.<sup>[9,40-42]</sup>

The study applied descriptive statistics (percentage, mean, and standard deviation) and inferential

statistics (*t*-test and Pearson's correlation coefficient) to analyze the data received by using the SPSS Statistics software (version 23.0, SPSS Inc., Chicago, IL, USA), and applied required analysis at the statistical significance level of 0.05 ( $P < 0.01$ ).

### Ethical consideration

This study is the part of the research project (IR.KUMS.REC.1397.108, No. 97056) sponsored by the Deputy of Research and Technology from Kermanshah University of Medical Sciences, Iran. The authors maintained all the protocols before performing all the procedures engaged in this study involving human participants in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

## Results

The total population comprised of 447 participants in the present study, including 215 male (48.1%) and 232 female (51.9%) students. The average age of the respondents under investigation was  $23.47 \pm 4.58$  years, and the majority of respondents' age ranged between 19 and 24 years (69.6%). Concerning the marital status, there were 360 single participants (80.50%) in this population. The second majority of the study indicated bachelor's degree students (202 students or 45.20%), and the majority of the discipline was a school of medicine (71 students or 15.90%). The majority of the dormitory students comprised 48.30% (216/447). The study findings specified that 356 students possessed their computers ( $356/447 = 79.60\%$ ), and the number of students using the Internet at their dormitories comprised 205 respondents ( $205/447 = 45.90\%$ ). The results indicated that the majority of the students used the Internet either in the morning or in the evening ( $367/447 = 82.10\%$ ).

The main reason for using the internet application was chatting with friends and family members. The mean and standard deviation of students with internet addiction was  $3.81 \pm 0.88$ . Besides, the mean and standard deviation of students' mental health was  $2.56 \pm 0.33$ , which stated that the general mental health of students was not in good condition. Regarding the mental health of the students' sample, the study results indicated that the highest and lowest rates showed linkage to depression with a mean and standard deviation of  $2.84 \pm 0.21$  and somatic dysfunction with a mean and standard deviation of  $2.16 \pm 0.79$ , respectively, as indicated in Table 1. This specific study applied the Pearson's correlation coefficient to determine the relationship between the students' internet addiction and mental health. The results of the correlation matrix demonstrated that they did not statistically significantly correlate with each other ( $P < 0.001$ ,  $r = 0.052$ ). The study

**Table 1: Internet addiction and mental health scores for different genders**

Variable	Male (%)	Female (%)	Total (%)	P
Nonaddicted users (a score of 20-49)	8 (1.8)	32 (7.2)	40 (8.9)	0.042
At-risk users (a score of 50-79)	104 (23.3)	100 (22.4)	204 (45.6)	
Addicted users (a score of 80-100)	103 (23)	100 (22.4)	203 (45.4)	
Internet addiction	2.44±0.56	2.29±0.69	3.81±0.88	0.013
Mental health	2.57±0.33	2.55±0.34	2.56±0.33	0.574

results specified that students' depression and somatic symptoms had the highest ( $P = 0.001$ ,  $r = 0.166$ ) and lowest ( $P > 0.001$ ,  $r = 0.006$ ) relationships with internet addiction, as indicated in Table 2.

## Discussion

The present study aimed to investigate internet addiction and its effects on the mental health of medical students at Kermanshah University of Medical Sciences. The results of the present study demonstrated that 45.5% of students at Kermanshah University of Medical Sciences were addicted to the Internet. This finding was concurrent with the results of studies conducted by Farhadinia *et al.*,<sup>[43]</sup> Sepehrian and Jokar,<sup>[44]</sup> Fonia *et al.*,<sup>[27]</sup> and Dargahi and Razavi.<sup>[45]</sup> Those who use the Internet more than others can replace stronger relationships in real life with low-quality social relationships, thereby resulting in more loneliness and depression. To further explicate the matter, the Internet may serve as a substitute for lives without vitality. Loneliness and isolation may cause people to spend more time on the Internet, thereby decreasing the quality of their social relationships.

As for the demographic characteristics, the results demonstrated that there was a significant difference between male and female students in terms of internet addiction. In addition, 23% of male students were internet addicts, which exceeded that of female students by 22.4%. In this study, male students should be given priority in prevention programs for internet addiction. These results were consistent with the results of studies conducted by Alavi *et al.*,<sup>[30]</sup> Orsal *et al.*,<sup>[46]</sup> and Fonia *et al.*,<sup>[27]</sup> whereas inconsistent with the results of studies performed by Atashpour *et al.*,<sup>[47]</sup> and Shahbazirad and Mirderikvand.<sup>[48]</sup> Male students seem to have more internet addiction than girls. In fact, the present research, in line with the findings of previous studies, shows that men are more exposed to internet addiction, not because of biological differences between the two genders, but due to different social and environmental factors to which each gender is exposed. According to the results, it seems that this finding can be an alarm at the increase in this disorder among students, and it is better that proper planning be done in this area in cooperation with university officials.

Based on the results of the present study, the mean score of male students' mental health was higher than that of

**Table 2: The results of Pearson's correlation coefficient between internet addiction and mental health among students**

Variable	1	2	3	4	5	6
Somatic symptoms	1					
Anxiety	0.020	1				
Social dysfunction	0.055	0.071	1			
Depression	0.153**	0.002	0.155**	1		
Mental health	0.419**	0.374**	0.871**	0.340**	1	
Internet addiction	0.006	0.054	0.048	0.166**	-0.052	1

\*\*Correlation was significant at the 0.01 level (two tailed)

female students, and no significant difference was seen between gender and mental health. However, the finding of the present study was consistent with the results of studies conducted by Taji and Verdinejad,<sup>[49]</sup> Namdar *et al.*,<sup>[50]</sup> and Imani *et al.*<sup>[51]</sup> In studies done by Asadi *et al.*,<sup>[52]</sup> Gorgich *et al.*,<sup>[9]</sup> Fonia *et al.*,<sup>[27]</sup> and Xu and Liu,<sup>[23]</sup> it was expressed that female students had more mental disorders than male students, which was inconsistent with the results of the present study. It should be noted that the mean score of male students' mental health was higher than that of female students, possibly due to men's ability to communicate with others in the society and university, the ability to deal with problems and difficulties, and the ability to earn money, as well as women's excessive emotional dependency on their families and lack of social security in the society.

The results of this study revealed that half of the students had poor mental health, and there was a significant difference between the mean scores of depression and internet addiction. These results were consistent with the results of studies done by Nastizai,<sup>[28]</sup> Anderson *et al.*,<sup>[12]</sup> and Chung and Wong.<sup>[53]</sup> In a study done by Abdollahi on nursing students at Tehran University of Medical Sciences, it was shown that 32.1% of students had suspected mental disorders, which was 29.7% in women and 34.3% in men.<sup>[54]</sup> In addition, Rafiei and Mosavipour showed that 67.9% of students at Arak University of Medical Sciences had symptoms of mental disorders, and only 32.1% of them had normal mental health.<sup>[55]</sup> Similarly, Masoudi *et al.* concluded that 52.4% of students at Tehran University of Medical Sciences were suffering from mental health disorders.<sup>[56]</sup> Similarly, in a study done by Yavarian *et al.* on students at Uromia University of Medical Sciences, it was demonstrated that 45.8% of students had different degrees of mental

health disorders. In their study, it was also revealed that 10%, 0.5%, and 3.2% of students had severe disorders in terms of somatic symptoms, anxiety and insomnia, and depression, respectively. This finding was concurrent with the results of the present study.<sup>[57]</sup> It seems that the different prevalence of psychiatric disorders in various studies can be attributed to several factors, including the differences in groups under study.

The results revealed that internet addiction and mental health were negatively related, which was consistent with the results of studies conducted by Shahbazirad and Mirderikvand,<sup>[48]</sup> Fallah Mehneh,<sup>[58]</sup> and Mousavomoghadam *et al.*<sup>[59]</sup> Hosseini *et al.* showed that 4.2% of students at Payam Noor University of Charm had severe addiction to the Internet. In addition, a significant relationship was observed between internet addiction and mental health.<sup>[60]</sup> Similarly, in a study performed by Farhadinia *et al.*, it was demonstrated that internet addiction and mental health significantly correlated among the students of Lorestan University of Medical Sciences,<sup>[43]</sup> which seems to lay the groundwork for the internet addicts. Some people resort to the Internet to reduce their depression. In this case, the Internet may provide a substitute for the joyless lives of depressed people, or they may get depressed as a result of internet addiction. In other words, the internet addicts will experience the negative consequences, such as depression.

In justifying the relationship between depression and internet addiction, it can be expressed that the excessive use of the Internet can lead to social isolation and depression through reducing familial, social, and local connection. Therefore, depression may occur as a result of internet addiction, and in this case, the internet addicts experience the resultant negative consequences, such as depression.<sup>[28]</sup>

The results revealed that the five major predictors of vulnerability to internet addiction in university students were as follows: the key reason for using the Internet, faculty, depression, the main place for using the Internet, and somatic symptoms.

### Limitations of the study

Concerning the limitations, this study evaluated medical students in the classrooms based on different groups. The discussions among students could present bias in their feedback. There was no face-to-face interview session, and the data set reported on a self-reported questionnaire, which increases the risk of social desirability biases among medical students of medicine, dentistry, and pharmaceutical departments at self-governing Education Incubator of Kermanshah, Iran. The limitations of the current study specify that researchers can consider a

large sample size based on medical students as well as other departments to execute their investigations in western part of Iran. Scholars can find experimental and longitudinal methods with larger samples to examine different results.

## Conclusions

According to the findings of the present study, it can be concluded that students' excessive use of the Internet leads to depression, anxiety, and reduced mental health, thereby affecting their academic performance. Hence, it is suggested that further monitoring and control be exercised on how the Internet is used by university students, and they should be informed of the detrimental effects of this technology in the case of misuse or overuse. The findings of the present study are also indicative of the significance of preventative measures in the form of educational and counseling programs for students regarding the proper and practical use of the Internet. In addition, addressing the issues and problems relating to communication technologies, such as the Internet, can lay the groundwork for proper education and instigate parents' and families' further attention to proper and effective use of the Internet.

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### Conflicts of interest

There are no conflicts of interest.

## References

1. Bisen SS, Deshpande YM. Prevalence, predictors, psychological correlates of internet addiction among college students in India: A comprehensive study. *Anatol J Psychiatry* 2020;21:117-23.
2. Abbas J, Aman J, Nurunnabi M, Bano S. The impact of social media on learning behavior for sustainable education: Evidence of students from selected universities in Pakistan. *Sustainability* 2019;11:1683-91.
3. Zhang MW, Lim RB, Lee C, Ho RC. Prevalence of internet addiction in medical students: A meta-analysis. *Acad Psychiatry* 2018;42:88-93.
4. Reshadat S, Zangeneh A, Saeidi S, Ghasemi SR, Rajabi Gilan N, Abbasi S. Investigating the economic, social and cultural factors influencing total fertility rate in Kermanshah. *J Mazandaran Univ Med Sci* 2015;25:108-12.
5. Bener A, Yildirim E, Torun P, Çatan F, Bolat E, Aliç S, *et al.* Internet addiction, fatigue, and sleep problems among adolescent students:



- A large-scale study. *Int J Mental Health Addict* 2018;24:1-11.
6. Fumero A, Marrero RJ, Voltes D, Penate W. Personal and social factors involved in internet addiction among adolescents: A meta-analysis. *Comput Hum Behav* 2018;86:387-400.
  7. Plunkett JW. Plunkett's E-Commerce & Internet Business, Almanac 2020. American Reference Books Annual: Plunkett Research, Limited; 2020.
  8. Hilty DM, Snowdy CS, Shoemaker EZ, Gutierrez YS, Carli V. Social media, e-health and clinical practice: Tips for clinicians, guidelines, and exploring pathological internet use. *Med Res Arch* 2016;3:2-14.
  9. Gorgich EA, Moftakhar L, Barfroshan S, Arbabisarjou A. Evaluation of internet addiction and mental health among medical sciences students in the Southeast of Iran. *Shiraz E Med J* 2018;19:E55561.
  10. Smita G, Azhar F. Prevalence and characteristics of internet addiction among university students in Mauritius. *SM J Case Rep* 2018;4:1077-82.
  11. Guillot CR, Bello MS, Tsai JY, Huh J, Leventhal AM, Sussman S. Longitudinal associations between anhedonia and internet-related addictive behaviors in emerging adults. *Computers Hum Behav* 2016;62:475-9.
  12. Anderson EL, Steen E, Stavropoulos V. Internet use and problematic internet use: A systematic review of longitudinal research trends in adolescence and emergent adulthood. *Int J Adol Youth* 2017;22:430-54.
  13. Dalbudak E, Evren C. The relationship of Internet addiction severity with Attention deficit hyperactivity disorder symptoms in Turkish university students; impact of personality traits, depression and anxiety. *Compre Psychiatry* 2014;55:497-503.
  14. Ziapour A, Kianipour N. Health-related quality of life among university students: The role of demographic variables. *J Clin Diagn Res* 2018;12:JC01-4.
  15. Ko CH, Yen JY, Yen CF, Chen CS, Chen CC. The association between Internet addiction and psychiatric disorder: A review of the literature. *Eur Psychiatry* 2012;27:1-8.
  16. Lu WH, Lee KH, Ko CH, Hsiao RC, Hu HF, Yen CF. Relationship between borderline personality symptoms and Internet addiction: The mediating effects of mental health problems. *J Behav Addict* 2017;6:434-41.
  17. Young KS. Internet addiction: The emergence of a new clinical disorder. *Cyberpsychol Behav* 1998;1:237-44.
  18. Mohamed G, Bernouss R. A cross-sectional study on internet addiction among Moroccan high school students, its prevalence and association with poor scholastic performance. *Int J Adol Youth* 2020;25:1-12.
  19. Wu XS, Zhang ZH, Zhao F, Wang WJ, Li YF, Bi L, et al. Prevalence of Internet addiction and its association with social support and other related factors among adolescents in China. *J Adol* 2016;52:103-11.
  20. World Health Organization. Promoting mental health: Concepts, emerging evidence, practice: Summary report. Melbourne: Department of Mental Health and Substance Abuse in Collaboration with the Victorian Health Promotion Foundation and the University of Melbourne; 2009.
  21. Rigi Kootesh B, Raisi M, Ziapour A. Investigation of relationship between internet addict with mental health and quality sleep in students. *Acta Med Mediterr* 2016;32:1921-5.
  22. Kaboudi M, Dehghan F, Ziapour A. The effect of acceptance and commitment therapy on the mental health of women patients with type II diabetes. *Ann Trop Med Public Health* 2017;10:1709-13.
  23. Xu N, Liu Y. Coping strategy mediates the relationship between body image evaluation and mental health: A study with Chinese college students with disabilities. *Disabil Health J* 2020;13:100830.
  24. Chung S, Lee J, Lee HK. Personal factors, internet characteristics, and environmental factors contributing to adolescent internet addiction: A public health perspective. *Int J Environ Res Public Health* 2019;16:4635-42.
  25. Reshadat S, Saedi S, Zangeneh A, Amooie MR, Karbasi A. Equity in access to health care using geographic information system: A Kermanshah case study. *J Mazandaran Univ Med Sci* 2014;24:134-40.
  26. Lashgarara B, Taghavi Shahri M, Maheri AB, Sadeghi R. Internet addiction and general health of dormitory students of Tehran University of Medical Sciences in 2010. *J Sch Publ Health Instit Public Health Res* 2012;10:67-76.
  27. Fonia B, Godiyal S, Uniyal MM. Internet addiction and mental health of higher secondary level students. *Int J Educ Psychol Res* 2016;5:42-4.
  28. Nastizai N. The relationship between general health and internet addiction. *Zahedan J Res Med Sci* 2009;11:57-63.
  29. Fallah Mehneh T. Disorder of internet addiction. *Psychol Informa* 2007;1:26-31.
  30. Alavi S, Eslami M, Meracy M, Najafi M, Jannatifard F, Rezapour H. Psychometric properties of Young internet addiction test. *Int J Behav Sci* 2010;4:183-9.
  31. Mirzaian B, Baezzat F, Khakpoor N. The addiction among students and its effect on mental health. *J Inform Commun Techno Educ* 2011;2(1):141-60.
  32. Taheri Mobarakeh M, Salami M, Hashemian M, Norouzi A. The effects of social networks on mental health of library users. *J Health Admin* 2017;19:71-80.
  33. Simo B, Bamvita JM, Caron J, Fleury MJ. Predictors of mental health service use among individuals with high psychological distress and mental disorders. *Psychiatry Res* 2018; 270:1122-30.
  34. Mohammadsalehi N, Mohammadbeigi A, Jadidi R, Anbari Z, Ghaderi E, Akbari M. Psychometric properties of the Persian language version of yang internet addiction questionnaire: An explanatory factor analysis. *Int J High Risk Behav Addict* 2015;4:E21560.
  35. Mohammadbeigi A, Mohammadsalehi N. Prevalence of internet addiction and related risk factors in students. *J Guilan Univ Med Sci* 2011;20:41-8.
  36. Arbabisarjou A, Gorgich EA, Barfroshan S, Ghoreishinia G. The association of internet addiction with academic achievement, emotional intelligence and strategies to prevention of them from student's perspectives. *Int J Hum Cult Stud* 2016;3:1656-66.
  37. Gorgich EA, Barfroshan S, Ghoreishi G, Balouchi A, Nastizaie N, Arbabisarjou A. The association of self-assessed emotional intelligence with academic achievement and general health among students of medical sciences. *Glob J Health Sci* 2016;8:27-32.
  38. Kim JH, Lau C, Cheuk KK, Kan P, Hui HL, Griffiths SM. Brief report: Predictors of heavy Internet use and associations with health-promoting and health risk behaviors among Hong Kong university students. *J Adol* 2010;33:215-20.
  39. Goldberg D. Manual of the General Health Questionnaire. NFER Nelson; 1978.
  40. Bashiri Z, Aghajani M, Alavi NM. Effects of psychoeducation on mental health in patients with coronary heart disease. *Iran Red Crescent Med J* 2016;18:E25089.
  41. Gorgich EA, Zare S, Ghoreishinia G, Barfroshan S, Arbabisarjou A, Yoosefian N. Job stress and mental health among nursing staff of educational hospitals in South East Iran. *Thrita* 2017;6:777-80.
  42. Jackson C. The general health questionnaire. *Occupat Med* 2007;57:79-83.
  43. Farhadinia M, Jalilvand M, Foroughi S, Rezaii S. Study of relationship between the Internet addiction and general health of students of Lorestan university of medical sciences in 2013. *Yafte* 2015;17:62-74.
  44. Sepehrian F, Joka L. Surveying internet addiction prevalence rate among Orumiye Universities' students and its predicting factors. *J Daneshvar* 2011;1:51-60.
  45. Dargahi H, Razavi M. Internet addiction and factors related with it in Tehran city. *Q J Payesh* 2007;6:265-72.

46. Orsal O, Orsal O, Unsal A, Ozalp SS. Evaluation of internet addiction and depression among university students. *Proc Soc Behav Sci* 2013;82:445-54.
47. Atashpour H, Jalali D, Asadian S. Comparison of internet addiction in users based on thinking styles. *Knowledge Res Apply Psychol* 2005;23:55-72.
48. Shahbazirad A, Mirderikvand F. The relationship of internet addiction with depression, mental health and demographic characteristic in the students of Kermanshah University of Medical Sciences. *Sci J Ilam Univ Med Sci* 2014;22:1-8.
49. Taji F, Verdinejad F. The study of the relation between internet addiction and mental health of the BA and MA students of the faculty of management and accounting at Allameh Tabataba'i University. *J Med Cult* 2013;3:59-79.
50. Namdar AH, Ebrahimi H, Sahebihagh MH, Arshadi BM. Mental health status and its relationship with academic achievement in students of Tabriz Nursing-Midwifery School. *Iran J Med Educ* 2013;13:146-52.
51. Imani E, Khademi Z, Soudagar S, Naghizadeh F. Health status of nursing students of Hormozgan University of medical sciences by Goldberg's general health questionnaire-2011. *Hormozgan Med J* 2013;17:357-64.
52. Asadi M, Adarvishi S, Mahmoodi M, Fayazi S, Ghasemi DehCheshmeh M. Relationship between mental health and demographic factors in nursing students. *Iran J Health Care* 2014;14:79-88.
53. Cheung LM, Wong WS. The effects of insomnia and internet addiction on depression in Hong Kong Chinese adolescents: An exploratory cross-sectional analysis. *J Sleep Res* 2011;20:311-7.
54. Abdollahi D. Association of educational planning with mental health of nursing students of Tehran Medical Science University with emphasis on the educational stressor factors and stress management methods. *Iran J Health Educ Health Prom* 2016;4:40-9.
55. Rafiei M, Mosavipour S. Happiness, mental health, and their relationship among the students at Arak University of Medical Sciences in 2010. *Arak Med Univ J* 2012;15:15-25.
56. Masoudi AI, Rajabi Vasokolaee G, Nazari H, Goudarzi L, Raadabadi M. The evaluation of relationship between mental health and spiritual health of students at Tehran University of Medical Sciences, 2013. *Teb Tazkiyeh* 2013;23:55-66.
57. Yavarian R, Ramezanpour A, Haghighi M, Radfar M. A survey on relationship between perfectionism and mental health in students of Urmia University of Medical Sciences. *J Urmia Nurs Mid Faculty* 2017;15:497-503.
58. Fallah Mehneh T. Disorder of internet addiction. *Psychology* 2007;1:26-31.
59. Mousavomoghadam SR, Nouri T, Khodadadi T, Ahmadi A, Ghiasi G. Association of internet addiction and self-control with mental health among students of the university of applied sciences and technology, Ilam City, Iran. *J Sch Public Health Instit Public Health Res* 2017;15:1-8.
60. Hosseini S, Hematfard H, Isfahani P, Moradpour I. Mental health status and its relation with students' internet addiction at Charam Payame Noor University in 2014. *Q J Sabzevar Univer Med Sci* 2015;22:481-9.