

# The Analysis of Psychological Aspects of Online Education: Depression and Happiness and Their Relationship with College Students' Academic Achievement

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## Abstract

**Background:** Physical and psychological problems faced by college students during the COVID-19 pandemic and via online education can be investigated and prevented. Internet addiction, especially in online education, affects the student's academic and social life. This study aimed to explore the psychological aspects of depression and happiness due to Internet addiction and their relationships with students' academic achievement.

**Methods:** This cross-sectional study was conducted on 510 students who were studying at Kerman University of Medical Sciences in 2019. The students were selected using multi-stage cluster sampling. The instruments used to collect the data were three standard questionnaires and a data collection form. The collected were analyzed statistically with SPSS software (version 22).

**Results:** The mean score of Internet addiction was  $36.73 \pm 18$ . Overall, 140 students (27.4%) were at the pre-addiction stage and 19 students (3.7%) were severely dependent on the Internet and social media. Internet addiction had a significant correlation with depression and happiness. However, no significant relationship was observed between Internet addiction and academic achievement. The results of multivariate linear regression analysis showed that Internet addiction was significantly correlated with the students' age ( $P = 0.047$ ), marital status ( $P = 0.001$ ), and academic level ( $P = 0.002$ ).

**Conclusion:** The results of this study suggested approximately one-third of students were dependent on the Internet and social media or were about to become addicted. The results also confirmed the link between Internet addiction with depression and happiness in the students. Thus, Internet addiction showed a negative correlation with happiness but a positive correlation with addiction and depression. However, no significant relationship was observed between Internet addiction and academic achievement. Although the use of online education is a complementary and effective educational technique, it should be carefully managed in educational programs.

**Keywords:** Internet Addiction, Social Media, Students, Academic Achievement, Happiness, Depression

## Background

Internet access is growing fast, with a greater number of people becoming Internet users each day. The Internet is everywhere: at home, at school, and even in malls, and the number of Internet users is growing dramatically [1]. In Iran, the use of the Internet has been increasing rapidly since the beginning of the century. Besides, the use of social media and networks has become widespread in the last decade and, according to the Statistical

Center of Iran, more than 47 million Iranians use social media and networks [2].

Along with the growing access of people to the Internet, we are witnessing a new type of addiction, i.e. Internet addiction, which is a growing issue in the Information age [3]. Ivan Goldberg first introduced Internet addiction in 1995, which develops a kind of behavioral dependence on the Internet in people and acute cas-

es can manifest themselves as a disease that needs treatment. Many patients are unaware of it or do not take it seriously. In his article, Goldberg states that the first step in treating Internet addiction is to be aware of one's illness [4-6].

Like all other forms of addiction, Internet addiction is associated with symptoms such as anxiety, depression, mood swings, restlessness, obsessive thoughts, isolation, emotional disorders, and social breakdown. There are various statistics on the prevalence of Internet addiction in different societies. But on average, the proportion of addicts is about 2 to 5 million for every 50 million regular users. In other words, it can be suggested that approximately 5 to 10% of Internet users have addiction problems [3].

Various studies conducted on students have suggested that the use of the Internet, as well as the incidence and prevalence of Internet addiction, is increasing and is associated with problems such as reduced interpersonal communication, anger, aggression, and excitement. Internet addiction also increases academic failure in this group [4]. Young's studies suggested that 50% of students who regularly use the Internet had lower grades and paid less attention to instructions provided in the classroom [7-9].

Donnelly et al. found a positive relationship between Instagram addiction and depression [10]. Rastgar et al. explored Internet addiction, social intimacy, and happiness in college students using the Oxford Happiness Inventory. The results showed no significant difference between the two groups of healthy users and users with mild Internet addiction in terms of happiness and social intimacy. However, the level of happiness and social intimacy reported by both groups was significantly higher compared to the group of users with acute Internet addiction [11].

Given the importance and widespread use of the Internet and social media in higher education and their effects on the social and academic life of students, this study explores the association of Internet addiction with students' academic achievement, depression, and happiness.

## Methods

### Design and Setting

This cross-sectional study was conducted on students of Kerman University of Medical Sciences.

### Sample and Eligibility

The participants were selected using multi-stage cluster sampling. To this end, each faculty was considered as a cluster. First, 5 faculties were randomly selected from among the faculties of the university, and the sample size for each faculty was calculated in proportion to the number of students in each faculty. In the next stage, several classes were randomly selected from each faculty and the questionnaires were completed for all students of the selected classes.

The inclusion criterion for attending the study covered all students studying at Kerman University of Medical Sciences. Students who were not willing to participate in the study for any reason, people who were replaced by accident, and also fresh-

man students were not included in the study because they are newcomers and no grade point average was calculated for them.

Various studies were reviewed to calculate the sample size. The prevalence of Internet addiction among students of Kurdistan University of Medical Sciences was reported by Vahabi et al. to be 30% [12]. Using the sample size calculation formula for two independent groups and considering the prevalence of 30%, the sample size was estimated as 510 persons.

The instruments used to collect the data were three standard questionnaires and a data collection form. The data collection form assessed the participants' age, marital status, academic level, place of residence, college, and field of study.

## Questionnaire Design

### *Internet and Social Network Addiction Questionnaire*

To measure Internet addiction, a self-administered social media addiction questionnaire developed by Khajehmadi et al. was used [13]. This questionnaire was the localized and updated version of Young's Addictive Use of the Internet Questionnaire [14]. The questionnaire contained 23 items that were scored on a five-point Likert scale ranging from *Disagree*, *Somewhat Disagree*, *No Comment*, *Somewhat Agree*, and *Agree*. The scores ranged from 0 to 92, with a higher score indicating greater Internet addiction and more severe problems resulting from overuse of the person. To interpret the score obtained from administering the questionnaire, the instructions provided by the developer were used. Accordingly, a score of 0 to 23 indicated a lower-than-normal user, a score of 24 to 46 indicated a normal user, a score of 47 to 70 indicated a pre-addicted user, and a score of 71 to 92 denoted an addicted user.

### *Oxford Happiness Inventory*

The Oxford Happiness Inventory (OHI) was used to measure the students' happiness [15]. The validity and reliability of the Persian version of the inventory were assessed by Alipoor and Noorbala by administering it to students of Tehran University [16]. The inventory contains 29 items, each with four statements scored from 0 to 3, respectively. The total score ranges from 0 to 87, with a higher score indicating a greater level of happiness.

### *Patient Health Questionnaire (PHQ-9)*

The Patient Health Questionnaire (PHQ-9) was used to assess the students' depression. This questionnaire contains 9 items that assess the individual's condition in the last two weeks. The items are scored based on a four-point Likert scale from never to almost every day and were developed by Kroenke et al. with 88% sensitivity and specificity for diagnosing depression. A score of 1 to 4 shows no depression, a score of 5 to 9 denotes mild depression, a score of 10 to 14 indicates moderate depression, a score of 15 to 19 shows relatively severe depression, and a score of 20 to 27 indicates severe depression [17]. Before completing the questionnaires, one of the researchers provided the students with some explanations about the objectives of the study and how to complete the questionnaires. The students were free not to complete the questionnaire if they wished so. The average time given to the students to complete the questionnaires was 25 minutes.

## Data Analysis

The collected data were coded and analyzed using SPSS software (version 22) through linear regression analysis and Pearson correlation test at the significance level of 0.05 ( $P = 0.05$ ).

## Ethical Approval

The ethical principles for medical research involving human subjects under the Declaration of Helsinki (2013) were observed in all stages of the study. Also, the research proposal was reviewed by the Ethics Committee of Kerman University of Medical Sciences and was registered with the code IR.KMU.REC.1397.515. All methods were carried out in accordance with relevant guidelines and regulations in the Ethical Declarations.

## Results

A total of 545 students of Kerman University of Medical Scienc-

es were selected from 5 faculties of health, paramedical sciences, management, and information, pharmacy, and nursing and midwifery to participate in the study. Fourteen students refused to participate in the study and 21 students who did not answer all items in the questionnaire were excluded from the study and finally, the data from 510 questionnaires completed by the students were used in the data analysis.

The results showed 71.6% of the students participating in this study were female, 84.9% of them were single and 78.5% of the participants were undergraduate students. Furthermore, 54.7% of the students lived in dormitories and 86.8% of the students were in the age group of 18-25 years. The average age of the students was  $22.09 \pm 4.27$  years, ranging from 17 to 44 years, and 40.8% of students spent over 3 hours per day on social media (Table 1).

**Table 1: The Descriptive Statistics for the Participants' Demographic Data**

Variable		Number	Percentage
Gender	Male	145	28.4
	Female	365	71.6
Age	18-25	443	86.9
	26-35	56	11
	36-45	11	2.2
Marital status	Single	433	84.9
	Married	71	13.9
	Divorced/widow	6	1.2
Faculty	Paramedic Sciences	122	23.9
	Management	65	12.7
	Health	136	26.7
	Nursing	143	28
	Pharmacy	44	8.6
Accommodation	Local	193	37.8
	Dormitory	279	54.7
	Private house	22	4.3
	Other	16	3.2
Academic level	Bachelor's degree	400	78.4
	Master's degree	35	6.9
	Ph.D.	29	5.7
	Ph.D.	46	9
Social media use (hours)	Non-user	1	0.2
	> 05	22	4.3
	0.5-1	50	9.8
	1-2	90	17.6
	2-3	139	27.3
	< 3	208	40.8

It was also shown that 140 students (27.4%) were at risk of internet addiction and 19 (3.7%) are addicted to the Internet and social networks (Table 2). Besides, of the social media common-

ly used in the country, 7.95% of students used Telegram, 75.9% used Instagram, and 55.9% used WhatsApp messenger and only 4.7% of students used Iranian social networks (Table 3).

**Table 2: The Severity of the Internet Addiction Among the Participants**

Overall severity of the Internet addiction								Total	
Less than normal		Normal		Pre-addiction		Addicted			
Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
126	24.7	225	44.2	140	27.4	19	3.7	510	100

**Table 3: The Use of Common Social Media Across the Country**

Social media	Number	Percentage
Telegram	488	95.7
Instagram	387	75.9
WhatsApp	285	55.9
YouTube	90	17.6
Facebook	34	6.7
Iranian media	24	4.7
Skype	4	0.8
None	2	0.4

The linear correlation between the three instruments used in this study including the Internet and Social Network Addiction Questionnaire, the Oxford Happiness Inventory, and the Patient Health Questionnaire (PHQ-9) was assessed. The results showed a significant correlation between the three instruments used in the study. Thus, there was a negative correlation between Internet addiction and happiness. Accordingly, as the value of one of these variables increased, the other variable decreased. For example, an increase in the Internet addiction would lead

a decrease in happiness ( $r = -0.34$ ), ( $P < 0.0001$ ). There was a positive correlation between Internet addiction and depression and thus an increase in one of these variables would lead to a decrease in the other variable ( $r = 0.36$ ), ( $P < 0.0001$ ). Finally, there was a negative correlation ( $r = -0.51$ ) between depression and happiness indicating that as the student's depression increases they reported a lower level of happiness and vice versa ( $P < 0.0001$ ) (Table 4).

**Table 4: Correlations Between the Internet Addiction, Happiness, and Depression**

Variable	Internet addiction		Happiness	
	r	P-value	r	P-value
Internet addiction	-	-	-	-
Happiness	-0.34	<0.0001	-	-
Depression	0.36	<0.0001	-0.51	<0.0001
Academic achievement	-0.028	0.52	-	-

First, all variables were evaluated using univariate analysis, and the variables with significant values were added into a multivariate model. The backward method was used in multivariate analysis and all variables with a P-value less than 0.05 were kept in the model. The results of multivariate linear regression analysis showed that there was a significant relationship between Internet addiction with age ( $p = 0.047$ ), marital status ( $p = 0.001$ ),

and academic level ( $p = 0.002$ ). Although there was a significant relationship between the students' gender the Internet addiction in univariate analysis, they were not significantly correlated in multivariate analysis (Table 5). The result of the Spearman correlation test also showed no significant correlation between Internet addiction and academic achievement (Table 4).

**Table 5: The Results of Univariate and Multivariate Regression Analysis for the Effect of the Research Variables on the Internet Addiction**

Variable	Category	Mean	Univariate		Multivariate	
			Regression coefficient	P-value	Regression coefficient	P-value
Age	18-25	38.31	-	-	-	-
	26-35	27.32	-10.98	<0.0001	-8.32	0.04
	36-45	21	-17.3	0.001	-13.79	0.05
Gender	Male	39.38	-	-	-	-
	Female	35	-3.70	0.03	-3.32	0.05
Academic level	Bachelor's degree	37.32	-	-	-	-
	Master's degree	29.63	-7.69	0.01	1.14	0.77
	Ph.D.	26.76	-10.56	0.002	0.86	0.87
	Ph.D.	43.24	5.91	0.03	6.29	0.02
Marital status	Single	38.41	-	-	-	-
	Married	26.38	-12.02	<0.0001	-8.37	0.001
	Divorced/widow	37.5	-0.57	0.93	2.69	0.71
Accommodation	Local	35.40	-	-	-	-
	Dormitory	38.23	2.82	0.09	-	-
	Private house	34	-1.40	0.72	-	-
	Other	30.25	-5.1	0.27	-	-

## Discussion

The present study showed that 3.7% of the students were addicted to the Internet and social networks and 27.4% of them were at risk of internet addiction. In comparison, the internet addiction rate was 2% lower and the risk of internet addiction was 17% less in a study conducted by Asiri et al. on students of Guilan University of Medical Sciences in 2012 [7]. Bahrainian reported the prevalence of Internet addiction among students of Birjand Azad University to be 40.7% [18]. Another study by Ghamari et al. on students at Arak University found the prevalence of Internet addiction was 2.8% [19]. It seems that the main reason for these conflicting results for the prevalence of Internet addiction in different studies is the difference in the instruments used for measuring Internet addiction. For instance, Ghamari et al. used Young's Internet Addiction Diagnostic Questionnaire (IADQ), which is very similar to the questionnaire used in the present study and the internet addiction prevalence was almost the same in both studies.

The results of the present study indicated that of the social media commonly used in the country, 7.95% of students used Telegram, 75.9% used Instagram, and 55.9% used WhatsApp messenger. Delshadi et al. surveyed social networking usage of students of Ilam universities and found 64.8% of students used WhatsApp messenger, 44.2% of students used Viber, and 20.8% of them used Facebook [20]. At the time of their study, online education and online media were not commonly used.

The present study found a significant negative correlation between Internet addiction and happiness, indicating that as the value of one of these variables increased, the other variable decreased. This finding was consistent with the results reported by Rastgar et al. and Akin. These two studies found that Internet addicts had a lower level of happiness than normal people, and

as the severity of addiction increased, their level of happiness decreased [11, 21, 22]. Besides, since Internet addiction is associated with anxiety, low self-esteem, and loneliness, and happiness is associated with self-confidence and positive emotions, this negative association seems reasonable [23-26].

The findings of this study also showed a significant positive correlation between Internet addiction and depression, indicating that internet addiction increases depression among the students and vice versa. Likewise, Bahrainian et al., Noori and Sadeghyan, and Nie et al. found a significant correlation between Internet addiction and depression. There is a two-way relationship between Internet addiction and depression in that a person's depression leads him/her to resort to the Internet and social media. On the other hand, excessive use of social networks leads to depression and lack of communication with others, which in the long run causes more depression resulting in a vicious cycle, worsening the situation of a person who is addicted to the Internet and social media [18, 27, 28]. Furthermore, previous studies have shown that depressed people have low self-esteem and do not dare to express their opinions in public, but they can use social media anonymously to express themselves, and this is one of the reasons for the excessive use of the Internet and social media [27]. Another factor accounting for the correlation between Internet addiction and depression is the effect of being on social media, observing the situation of other users of these media, and comparing one's life with other people's life displayed in media such as Instagram and Facebook. They post some images and materials (albeit unrealistically) that display them happy and successful. Therefore, people who use these media regularly may compare their living conditions with those of others and thus suffer from depression and lack of self-confidence [2, 29].

The present study also showed no significant relationship be-

tween Internet addiction and academic achievement. In contrast, Ajam and Rezvany and Behbodi and Behzadirad showed that if the internet and social media, and networks are used properly they can have positive effects on student learning by increasing interaction with other students, ease of access to resources, sharing scientific experiences, and improving academic performance [30, 31].

The findings of this study suggested a negative relationship between age and Internet addiction, indicating that as a user's age increases he/she will be less dependent on the Internet and social media. Accordingly, the students in the age group of 18-25 years had a higher internet addiction score than the students in other age groups. Asiri et al and Mohamady et al. found a negative relationship between age and Internet addiction. They also reported that people in the age group of 18 to 24 years had the highest mean score of Internet addiction [7, 32]. However, Vahabi et al. found no significant relationship between age and Internet addiction [12]. This can be attributed to the smaller number of students in higher age groups. However, the present study focused on students in different age groups. Perhaps one of the reasons for the high prevalence of Internet addiction among the student aged 18-25 years was their interest in seeking diversity and fun compared to other age groups.

According to the findings of the present study, the mean score of the Internet and social network addiction in females was significantly lower than males. Similarly, Vahabi et al. Ghamari et al. found that males had a higher mean score of social media addiction than females [12, 19]. This result has been observed in other studies [32-34]. However, some studies reported a higher mean score for social media addiction for females [35, 36]. A higher score of Internet addiction in males may be due to their greater interest in playing online games and following the news on social networks.

The results of the present study suggested that the single students were more exposed to Internet addiction than married students and there was a statistically significant difference between marital status and the mean score of Internet addiction. Dargahi and Mohamady et al. examined the factors affecting Internet addiction and found that Internet addiction is more prevalent in single people than married people [32, 37]. However, Ghamari et al. reported a higher rate of Internet addiction in married students than single students [19]. Accordingly, single students seem to have more leisure time than married students. On the other hand, the burden of marital and educational responsibilities on married students significantly reduces their chance of using the Internet excessively and therefore significantly become less dependent on the Internet compared to single students.

One of the limitations of the study, the data were collected using self-report instruments from the students and the accuracy of the data depended on the accuracy of the students' responses, and the researchers assume that the accuracy of the responses was the same for all participants.

## Conclusion

There is a two-way relationship between Internet addiction and depression in that a person's depression leads him/her to resort to

the Internet and social media. On the other hand, excessive use of social networks leads to depression and lack of communication with others, which in the long run causes more depression resulting in a vicious cycle. Therefore, the negative effects of this technology on students' lives and the consequences of its improper use can be reduced by teaching and applying preventive strategies. Furthermore, a culture for effective use of online social media can be built by making the best use of the benefits of online education and enhancing students' use of social media and networks for educational purposes.

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## Abbreviations

Kerman University of Medical Sciences (KMU), Oxford Happiness Inventory (OHI) the Patient Health Questionnaire (PHQ-9).

## Authors' Contributions

EN, AA, and HSh. wrote the main manuscript text. HSh analyzed and interpreted the questionnaire data. EN, AA and HSh co-wrote and approved the final manuscript.

## Consent for Publication

Not applicable.

## Availability of Data and Materials

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request

## Ethics Approval and Consent to Participate

This study was approved by Ethics Committee Kerman University of Medical Sciences (KMU) committee on 2019 (IR.KMU.REC.1397.515.). Information was provided to all participants and written consent was obtained prior to the start of the online questionnaire. All methods were carried out in accordance with relevant guidelines and regulations in the Ethical Declarations.

## Competing Interests

The authors report no actual or potential conflicts of interests.

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