

Internet Addiction in Relation to Mental Health among Medical Students, Menoufia University, Egypt

Reda A. Ibrahim¹, Amr S. Shalaby², Nagwa N. Hegazy³

¹Public Health and Community Medicine Department, ²Neuropsychiatry Department,

³Family Medicine Department, Faculty of Medicine, Menoufia University, Egypt

Corresponding author: Reda Abdel Latif Ibrahim, Telephone: 002-01095776864, email: reda_8083@yahoo.com

Orcid number: <https://orcid.org/0000-0003-1224-7695>

ABSTRACT

Background: Use of the Internet, computers, smartphones, and other electronic devices has dramatically increased over recent years, and this increase is associated not only with tremendous benefits to the users but also with documented cases of excessive use, which has negative health consequences. In many countries, the problem has reached the magnitude of a significant public health concern.

Objective: This study aimed at estimating the prevalence of Internet addiction among Egyptian medical students and its relation to their depression, anxiety and stress.

Results: Across sectional study including 678 medical students. Their age ranged from 17 – 24 years, 41.4% of them were males. The participants were subjected to a self-administered questionnaire that included personal data, family history and their previous year academic degree, compulsive Internet use scale (CIUS) was used, and also Depression Anxiety Stress Scale-21 (DASS -21) was used for assessing anxiety, depression, and stress. Problematic Internet use (PIU) among the participant students was 68.3%, PIU was significantly associated with increased family income, depression, anxiety and stress were also associated with PIU with odds ratio [1.57 (1.11 – 2.22), 1.65 (1.11 – 2.43), 1.48 (1.03 – 2.12)] respectively.

Conclusion: The high prevalence of problematic internet use (PIU) among medical students in Menoufia University is a matter of concern that is also associated with stress, anxiety, and depression as well as its negative impact on their academic achievement. It is important to plan comprehensive programs to raise public awareness about the hazards and introducing awareness and treatment services in primary health care facilities.

Keywords: Anxiety, Depression, Internet addiction, Medical students, Stress.

INTRODUCTION

The Internet nowadays is an important way for communication, source of information and knowledge, education tool, social network and entertainment hub in the contemporary world^[1]. Internet use has become a normal and important daily activity especially among adolescents and young adults^[2].

In 2015 it was found that about 90% of young adults used social media^[3]. Egypt's Internet user base has grown from 34.1 million in 2013 to 77.66 million in 2022, representing a 22 percent growth in internet use between 2019 and 2020 and proceeding increase till now as it registered +1.9% increase between 2021 and 2022. In January 2022, Egypt had a 71.9 percent Internet penetration rate^[4].

Internet addiction is defined as excessive or poorly managed preoccupations, urges, or attitudes related to computer usage and Internet access that cause impairment or suffering^[5].

The problem with Internet Addiction Disorder arises when these activities begin to interfere with daily life activities. Many research shows that it is not the sum of time spent online that is particularly problematic, but rather how it is used^[6].

Teenagers (12–19 years) and young youth (20–29 years) use the Internet more than any other age group and are at a greater risk of misuse, hence Internet addiction is more common among young people^[7].

Addiction to the Internet is becoming more common among university students all around the

globe. Although the Internet has many educational benefits, excessive usage may result in negative consequences such as medical and neurological difficulties, psychological instability, social isolation, and poor academic performance^[6]. Internet addiction has sparked widespread alarm and has been identified as one of the greatest public health threats, especially among teenagers^[8].

Many Egyptian research have shown links between Internet addiction and mental symptoms including sadness, anxiety, personality characteristics, loneliness, and low self-esteem among university students. The most common mental symptom linked to excessive usage of the Internet is depression.^[9,10]

Adolescents are at an especially high risk for mental illnesses; half of all mental illnesses begin before the age of 14, yet the majority of cases go unnoticed and untreated. Failure to treat teenage mental health concerns has long-term consequences that impair both physical and mental health, as well as the ability to live normal productive lives as adults^[11,12]. As a result, raising awareness of the physical and emotional effects of excessive internet usage is critical for improved management.

The purpose of this research was to determine the incidence of Internet addiction, examine its association to depression, anxiety, and stress, and also its impact on students' academic achievement.

MATERIAL AN METHODS

In November 2020, 678 medical students from Menoufia University in Egypt were recruited from grades 2 to 6 for cross-sectional analytical research.

Ethical Approval

The Research Ethics Committee of Menoufia University's Faculty of Medicine gave the authors an approval to perform this study under number (MNF/5/2021/COM1). Before being included in the research, all individuals supplied their informed consent. This study was designed to coincide with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

The participants of this study were subjected to the following:

Sociodemographic sheet:

Besides age and gender, the demographic sheet included questions about the social status of students, their parents' education and jobs, the grades they obtained during the previous years, and some questions about internet usage.

Compulsive Internet Use Scale (CIUS):

The DSM-IV criteria for drug addiction and compulsive gambling are used to create the CIUS [13]. It has a theoretical value range of 0–54 and consists of 14 Likert-scaled questions with responses ranging from never (0) to very frequently (4).

Loss of control, withdrawal, mood changes, obsession, and conflict are among the five signs of addiction covered. The CIUS assesses the intensity of obsessive Internet usage; higher values indicate more severe behavior. The CIUS has an internal consistency accuracy of around 0.90, according to many investigations [13,14].

A CIUS cutoff score of ≥ 21 has been suggested for identifying problematic Internet usage. The 14 original elements were translated into Arabic utilizing a translation and back-translation technique for the Arab-language adaption of the CIUS [15], a cut off value of more than 21 was considered as problematic Internet use (PIU) as compared to Internet addiction test (IAT) cut-off (≥ 40) [16].

The Depression Anxiety Stress Scales-21 (DASS-21)

The Depression Anxiety Stress Scales-21 (DASS-21) [17] were used to measure the students' psychological well-being. It's a 21-item self-report questionnaire that assesses the intensity of a variety of symptoms that are

frequent in both depression and anxiety. The participant must declare the existence of a symptom throughout the past week while completing the DASS. Each item is given a score ranging from 0 (didn't relate to me at all in the previous week) to 3. (Applied to me very much or most of the time over the past week).

Depression, anxiety, and stress scores are determined by adding scores of related items, which indicate the subject's levels of depression, anxiety, and stress. The DASS's primary purpose is to determine the degree of depression, anxiety, and stress symptoms. In table 1 [18], the severity rating cutoff values were specified. In a variety of research from various nations with different samples, the DASS-21 has been generally praised for its excellent reliability and diverse types of validity [19,20]. The Arabic version of DASS 21 was developed by Moussa et al, 2001 [21].

Table 1: Severity rating scores of DASS-21 [18]

	Depression	Anxiety	Stress
Normal	0 – 4	0 – 3	0 – 7
Mild	5 – 6	4 – 5	8 – 9
Moderate	7 – 10	6 – 7	10 – 12
Sever	11 – 13	8 – 9	13 – 16
Extremely sever	14+	10+	17+

Statistical methods

The information was transferred to a computer, categorized, and analyzed using SPSS (version 17, SPSS Inc., Illinois, Chicago, USA). The mean, standard deviation, and range were used to characterize quantitative data, which were compared by t-test. Numbers and percentages were used to describe qualitative data. To compare qualitative variables, the Chi-squared test was utilized. To determine the connection between quantitative and qualitative ordinal variables, Spearman correlation was utilized. Odds ratio measures the strength of association between an outcome and certain exposure compared to that occurs in the absence of such exposure. Statistical relevance was defined as a P-value < 0.05 .

RESULTS

The current study was conducted on 678 medical students selected from 2nd to 6th grade; their age was 19.98 ± 1.92 . Males represented 41.4% of participants, 54.1% of them were of rural residence, regarding mother and father education, their parents were mostly with a secondary and high level of education, family income was 63.1% sufficient and 97.6% of students had internet access (Table 2).

TABLES

Table 2: Sociodemographic criteria of the studied students

Participants (N = 678)		
	No	%
Age (years)		
Mean ±Standard deviation	19.98±1.92	
Range	17 – 24	
Sex		
Male	281	41.4
Female	397	58.6
Residence		
Rural	367	54.1
Urban	311	45.9
Father education		
Illiterate	14	2.1
Basic	91	13.4
Secondary	142	20.9
High	431	63.6
Mother education		
Illiterate	57	8.4
Basic	140	20.6
Secondary	214	31.6
High	267	39.4
Family income		
Less than sufficient	146	21.5
Sufficient	428	63.1
More than sufficient	104	15.3
Have internet access		
Yes	662	97.6
No	16	2.4

Table 3 shows a 68.3% rate of problematic Internet use, 30.2% of participants were normal regarding depression symptoms, about 53% of students complained of severe and extremely severe anxiety symptoms, severe and extremely severe stress symptoms were rerecorded in 31.1% of participants.

Table 3: Rate of problematic internet use, depression, anxiety and stress among the studied participants

	The studied participants (N = 678)	
	No	%
Compulsive internet use scale		
Non problematic use	215	31.7
Problematic use	463	68.3
Depression		
Normal	205	30.2
Mild	131	19.3
Moderate	158	23.3
Severe	93	13.7
Extremely severe	91	13.4
Anxiety		
Normal	135	19.9
Mild	97	14.3
Moderate	85	12.5
Severe	104	15.3
Extremely severe	257	37.9
Stress		
Normal	172	25.4
Mild	150	22.1
Moderate	143	21.1
Severe	114	16.8
Extremely severe	99	14.6

There was no association between problematic Internet usage with age, sex, location, or father and mother education, however problematic Internet use was strongly linked to high family income (Table 4).

Table 4: Problematic Internet use score and sociodemographic criteria of the investigated participants

	CIUS		Test	P value
	Non problematic use ≤ 21 N = 215	Problematic use > 21 N = 463		
Age (years)			t-test	
X ±SD	20.12±1.99	19.91±1.88	1.30	0.20
Range	17 – 23	17 – 24		
	No (%)	No (%)	X²	
Sex				
Male	99 (35.2)	182 (64.8)	2.75	0.10
Female	116 (29.2)	281 (70.8)		
Residence				
Rural	121(33.0)	246 (67.0)	0.59	0.44
Urban	94 (30.2)	217 (69.8)		
Father education				
Illiterate	6 (37.5)	10 (62.5)	3.57	0.31
Basic	14 (40.0)	21 (60.0)		
Secondary	33 (25.8)	95 (74.2)		
High	162 (32.5)	337 (67.5)		
Mother education				
Illiterate	122 (32.2)	257 (67.8)	0.67	0.88
Basic	47 (32.9)	96 (67.9)		
Secondary	21 (31.3)	46 (68.7)		
High	25 (28.1)	64 (71.9)		
Family income				
Less than sufficient	75 (51.4)	71 (48.6)	33.9	<0.001
Sufficient	109 (25.5)	319 (74.5)		
More than sufficient	31 (29.8)	73 (70.2)		

Problematic Internet usage was linked to depression, anxiety, and stress (Table 5).

Table 5: Problematic Internet use score and socio demographic criteria of the studied participants

Internet use	Depression		Anxiety		Stress	
	Absent	Present	Absent	Present	Absent	Present
Non problematic use	79 (38.7)	136 (28.7)	55 (40.7)	160 (29.5)	65 (37.8)	150 (35.5)
Problematic use	125 (61.3)	338 (71.3)	80 (59.6)	383 (70.5)	107 (62.2)	356 (70.4)
Total	204	474	135	543	172	506
X² Test (p value)	6.63 (0.01)		6.34 (0.01)		3.93 (0.047)	
Odds ratio (95% CI)	1.57 (1.11 – 2.22)		1.65 (1.11 – 2.43)		1.48 (1.03 – 2.12)	

CIUS was positively significantly correlated with average academic performance (Figure 1).

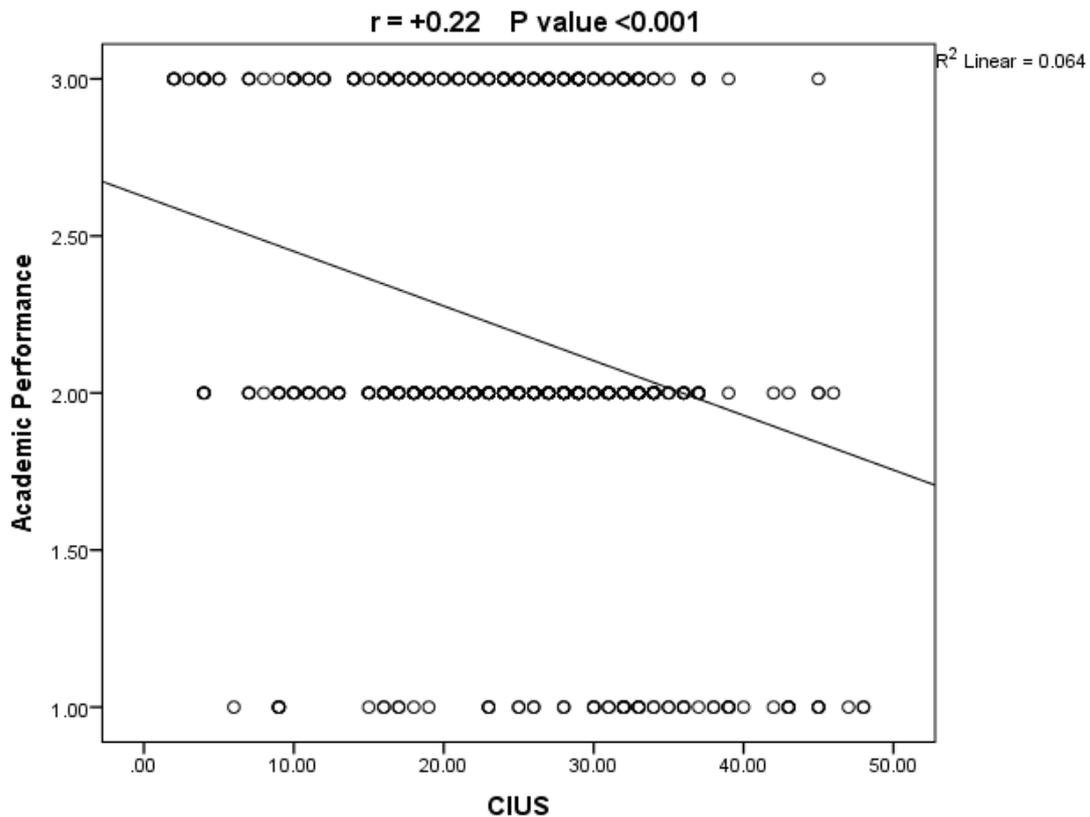


Figure 1: Spearman correlation between CIUS and average academic performance of the students

DISCUSSION

The Internet is a medium or an environment, and addiction or addictive behavior would be related to the activities on the Internet rather than the Internet itself [22].

in the current work, students with Internet access were estimated as 97.6% in the academic year 2019/2020, while a study in Tanta University revealed that students with Internet access were 85.8% in the academic year 2014/2015 [23]. This can be explained as the Internet showed very fast spread within few years and also, more educational dependence become currently present.

This work revealed a percentage of problematic Internet use (PIU) by using (CIUS) (CIUS >21) of 68.3%. **Shaheen et al.** [24] found a rate of problematic Internet use of 48.5% among Menoufia medical students (using Young IAT), while **Desouky and Ibrahem** [10] found the prevalence of PIU (using Young IAT) was 13.2% and 39.1% were potential addict in a sample of students from theoretical and scientific faculties. In a study conducted in Tanta, Egypt, by using Young IAT, there were 38.9% of students with an occasional problem and 3.8% of them with a significant problem [23]. **Ali et al.** [25] found 47.7% incidence of IA among medical students in Sohag. **Araby et al.** [26] found 70.5% were potential problematic Internet user but PIU was 13% among medical students in Benha University.

In Arab countries, **Abdel-Salam et al.** [27] reported that In Saudi Arabia, 48.6% of female university students were average Internet users, with 49.5 percent

having moderate addictions and 1.9 percent having severe addictions. According to **Taha et al.** [28], 12.4% of people were hooked to the Internet, and 57.9% had the potential to become addicted.

In Iraq, **Babakr et al.** [29] found that problematic Internet use was 36.5%

A high prevalence of PIU was noted by **Saikia et al.** [30], 80.7% in India, while in Poland, 23.52% of the respondents were potential PIU whereas full PIU was 5.88% [31]. An extremely low level of PIU was noticed by **Rebello et al.** [32] (10.1%). This low level may be exaggerated by taking a relatively higher cutoff point for PIU (CIUS>28). The huge variation in prevalence rates might be due to the fact that various sampling criteria were used, different scales that assess PIU, and also there is progressively increased spread and dependence on the Internet nowadays as it symbolizes the technological revolution in information and communication.

In this work, PIU was sex and residence independent, multiple studies revealed that no sex difference in internet use [23,29,32,33], while **Desouky and Ibrahem** [10] found that there was male predominance in PIU, which was also associated with high father and mother education. **Shaheen et al.** [24] found that PIU was associated with being a male and urban residence, also **Rebello et al.** [31] and **Ostovar et al.** [34] observed that male was more affected by PIU while **Taha et al.** [28] found female predominance.

Saikia et al 2019 found Internet addiction has a substantial link to stress (odds ratio=12), depression

(odds ratio=14), and anxiety (odds ratio=3.3). Also, **Desouky and Ibrahim** ^[10] revealed an association between PIU and psychological distress. **Ostovar et al.** ^[34] reported that Internet addiction was a predictor of stress, despair, anxiety, and loneliness. Depression, anxiety, and stress were shown to be independently linked with PIU by **Ramón-Arbués et al.** ^[35].

There was a substantial negative association between CIUS score and academic success; numerous Egyptian research found a similar finding ^[23,24,26].

CONCLUSIONS

From the previous results, it is obvious that Internet addiction is a substantial public health threat affecting the psychological wellbeing and academic performance of students. It has the criteria of addiction; there has been no official reaction from the government to the problem of Internet addiction. So it is important to plan for increasing awareness about the problem and its consequences and it is better to provide educational and treatment practice (as a treatment of social addiction) in primary health care facilities.

Conflict of interest: The authors declare no conflict of interest.

Sources of funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author contribution: Authors contributed equally in the study.

REFERENCES

1. **Mccarroll N, Curran K (2015):** Social networking in education. *International Journal of Innovation in the Digital Economy*, 4(1): 1-15
2. **Joshi V, Stubbe D, Li T et al. (2019):** The Use of technology by youth: Implications for psychiatric educators. <https://doi.org/10.1007/s40596-018-1007-2>
3. **Johnson J (2021):** Internet usage of teenagers in the United States - Statistics & Facts. Available at <https://www.statista.com/topics/2016/teenagers-internet-usage-in-the-us/>
4. **Kemp S (2022):** Egypt's population in 2022. Available at <https://datareportal.com/reports/digital-2022-egypt>
5. **Shaw M, Black W (2008):** Internet addiction: definition, assessment, epidemiology and clinical management. *CNS Drugs.*, 22 (5): 353-65.
6. **Gregory C (2021):** Internet addiction disorder. Available at <https://www.psychom.net/iadcriteria.html>
7. **Anderson L, Steen E, Stavropoulos V (2017):** Internet use and Problematic Internet Use: A systematic review of longitudinal research trends in adolescence and emergent adulthood. *International Journal of Adolescence and Youth*, 22 (4): 430-454.
8. **Mak K, Lai M, Watanabe H et al. (2014):** Epidemiology of internet behaviors and addiction among adolescents in six Asian countries. *Cyberpsychol Behav Soc Netw.*, 11: 720-8.
9. **Azab H, Effat S, Aly H et al. (2019):** Correlation of internet addiction with anxiety, depression and personality traits –Upper Egypt study. *Sohag Medical Journal*, 23(1): 142-153.
10. **Desouky E, and Ibrahim I (2015):** Internet addiction and psychological morbidity among Menoufia University students, Egypt. *American Journal of Public Health Research*, 3(5): 192-198.
11. **World Health Organization (2021):** Adolescent mental health. available at <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>
12. **Kessler C, Angermeyer M, Anthony C et al. (2007):** Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry*, 6(3): 168-176.
13. **Meerkerk J, Van Den Eijnden J, Vermulst A et al. (2009):** The Compulsive Internet Use Scale (CIUS): some psychometric properties. *Cyberpsychol Behav.*, 12: 1-6.
14. **Li W, O'Brien E, Snyder M et al. (2016):** Diagnostic criteria for problematic internet use among U.S. University Students: A mixed-methods evaluation. *PLoS ONE.*, 11(1): e0145981.
15. **Khazaal Y, Chatton A, Atwi K et al. (2011):** Arabic validation of the Compulsive Internet Use Scale (CIUS). *Subst Abuse Treat Prev Policy*, 6: 32.
16. **Guertler D, Rumpf J, Bischof A et al. (2014):** Assessment of problematic internet use by the Compulsive Internet Use Scale and the Internet Addiction Test: a sample of problematic and pathological gamblers. *Eur Addict Res.*, 20 (2): 75-81.
17. **Lovibond H and Lovibond F (1995):** Manual for the Depression Anxiety Stress Scales. Sydney Psychology Foundation Australia. available at [Manual For The Depression Anxiety Stress Scales | Download Books PDF/e \(seecoalharbour.com\)](http://www.psychology.org.au/ManualForTheDepressionAnxietyStressScales/DownloadBooksPDF/e%28seecoalharbour.com%29)
18. **Henry D, Crawford R (2005):** The short-form version of the Depression Anxiety Stress Scales (DASS-21): construct validity and normative data in a large non-clinical sample. *Br J Clin Psychol.*, 44 (Pt 2): 227-39.
19. **Osman A, Wong L, Bagge L et al. (2012):** The depression anxiety stress Scales—21 (DASS-21): Further examination of dimensions, scale reliability, and correlates. *J. Clin. Psychol.*, 68: 1322–1338.
20. **Oei P, Sawang S, Goh W et al. (2013):** Using the depression anxiety stress scale 21 (DASS-21) across cultures. *Int. J. Psychol.*, 48: 1018–1029.
21. **Moussa T, Lovibond F, Laube R (2001):** Psychometric properties of an Arabic version of the Depression Anxiety Stress Scales (DASS21). Report for New South Wales Transcultural Mental Health Centre. Cumberland Hospital, Sydney. Available at https://www.researchgate.net/publication/306328468_Psychometric_Properties_of_an_Arabic_Version_of_the_Depression_Anxiety_Stress_Scales_DASS_mthal_ltw_yn_almqays_alajnbyh_fy_almhyt_alrby_alkhsays_alsyk_wmtryh_llnskhk_alrbyh_lmgyas_alajhad_almqlq_alaky_t
22. **Starcevic V (2013):** Is Internet addiction a useful concept? *Aust N Z J Psychiatry*, 47: 16–19.
23. **Saied M, Elsabagh M, EL-Afandy M (2016):** Internet and facebook addiction among Egyptian and Malaysian medical students: a comparative study, Tanta University, Egypt. *Int J Community Med Public Health.*, 3(5):1288-1297

24. **Shaheen M, Farahat M, Gaber M (2016):** Problematic Internet Use among Medical School Students in Menoufia University Egypt. *J Child Adolesc Behav.*, 4:298.
25. **Ali R, Mohammed N, Aly H (2017):** Internet addiction among medical students of Sohag University, Egypt. *Journal of Egyptian Public Health Association*, 92(2): 86-95.
26. **Araby M, Abd El-Raouf E, Eltaher M (2020):** Does the nature of the study affect internet use and addiction? Comparative-study in Benha University, Egypt. [doi:10.5530/srp.2020.3.59](https://doi.org/10.5530/srp.2020.3.59)
27. **Abdel-Salam M, Alrowaili, I, Albedaiwi K et al. (2019):** Prevalence of internet addiction and its associated factors among female students at Jouf University, Saudi Arabia. *J. Egypt Public Health. Assoc.*, 94:12
28. **Taha H, Shehzad K, Alamro S et al. (2019):** Internet use and addiction among medical students in Qassim University, Saudi Arabia. *Sultan Qaboos Univ Med J.*, 19 (2): e142-e147.
29. **Babakr H, Majeed K, Mohamedamin P et al. (2019):** Internet addiction in Kurdistan University students: Prevalence and association with self-control. *European Journal of Educational Research*, 8(3): 867-873.
30. **Saikia M, Das J, Barman P et al. (2019):** Internet addiction and its relationships with depression, anxiety, and stress in urban adolescents of Kamrup District, Assam. *J Family Community Med.*, 26(2): 108-112.
31. **Tomczyk L, Solecki R (2019):** Problematic internet use and protective factors related to family and free time activities among young people. *Educational Sciences: Theory & Practice.*, 19(3):1-13.
32. **Rebello R, Prasad K, Hegde G (2017):** Assessment of Compulsive internet use among I MBBS students of KAIMS Karwar, Karnataka using CIUS. *SAS Journal of Medicine*, 3 (7): 158-162
33. **Haque M, Rahman A, Majumder A et al. (2016):** Internet use and addiction among medical students of Universiti Sultan Zainal Abidin, Malaysia. *Psychology Research and Behavior Management*, 9: 297 – 307.
34. **Ostovar S, Allahyar N, Aminpoor H et al. (2016):** Internet addiction and its psychosocial risks (Depression, Anxiety, Stress and Loneliness) among Iranian adolescents and young adults: A structural equation model in a cross-sectional study. *Int J Ment Health Addiction*, 14: 257–267.
35. **Ramón-Arbués E, Gea-Caballero V, Granada-López M et al. (2020):** The prevalence of depression, anxiety and stress and their associated factors in college students. *Int J Environ Res Public Health*, 17(19): 7001.