



ASSOCIATION AND IMPACT OF SEVERAL RISK FACTORS OF INTERNET ADDICTION DURING COVID-19 PANDEMIC AMONG UNIVERSITY STUDENTS IN THE SOUTHERN PART OF BANGLADESH

Sabiha Shirin Sara*, Md. Asikur Rahman, Md. Akhtarul Islam, Ashis Talukder

Statistics Discipline, Khulna University, Khulna 9208, Bangladesh

KUS: ICSTEM4IR-22/0078

Manuscript submitted: July 28, 2021

Accepted: September 27, 2022

Abstract

Internet addiction seems to have become a tremendous issue around the world during the COVID-19 pandemic situation. This study intends to investigate the underlying components and their consequences on internet addiction. Our study included about 348 participants from university students of the southern part of Bangladesh. The sample was obtained via convenience sampling strategy. Univariate analysis comprised frequencies with percentages, Chi-square test was used to determine the relationship between variables. With the help of multinomial logistic regression, the effect of various risk factors was found simultaneously. Our evaluation will be designated to indicate that majority respondents are moderate and addicted internet users. This may also reveal the significant risk factors: preferred place of using internet (RRR = 0.222, CI = [0.061,0.0811]), time since first internet use (RRR = 0.211, CI = [0.056,0.799]). Moreover, mental health condition such as depression (p-value < 0.01), anxiety (p-value = 0.006), and stress (p-value = 0.034) indicated significant relationship with internet addiction. Based on our findings, we were able to identify risk factors that could aid in the reduction of internet addiction.

Keywords: Risk factors, Internet addiction, Mental health condition, Depression, Anxiety, Stress

Introduction

Internet addiction commonly refers to an individual's inability to control his or her use of the internet (Shek et al., 2013) which can also be referred to as "problematic internet use" (de Vries et al., 2018). It has become an alarming health concern throughout the world. A study estimated that one in eight Americans suffers from problematic internet use (Young & Abreu, 2010). The prevalence of Internet addiction was 2.4% in China (Cao & Su, 2007), 10.4% in Taiwan (Wu et al., 2015), 1.5%, and 8.2% in surveys in the USA and Europe (Weinstein & Lejoyeux, 2010), and 3.2% among university students in the UK (Kuss et al., 2013). Moreover, in nine European countries, the prevalence rate of problematic IA varies from 14% to 55% (Laconi et al., 2018).

But the prevalence rate of internet addiction increased during the COVID-19 pandemic situation. The rate is 24.4% in Taiwan (Lin, 2020), 88.1% in South-East Nigeria (Onukwuli et al., 2022), and 14.4% in

*Corresponding author: <sabihashirin.ku@gmail.com>

DOI: <https://doi.org/10.53808/KUS.2022.ICSTEM4IR.0078-se>

Indonesia (Siste et al., 2020) during the pandemic situation. Another study conducted using six Asian countries specified that Internet addiction is highest in the Philippines and Internet Addictive Behavior is common here (Mak et al., 2014). Several risk factors are associated with internet addiction during the pandemic situation, such as loneliness (Saralioglu et al., 2022), fear of missing out, boredom proneness (Liang et al., 2022), fear of COVID-19, depression, anxiety (Servidio et al., 2021), hyperactivity (Zhao et al., 2021). Moreover, it is also responsible for insomnia and poor sleep quality (Lam, 2014, Zhang et al., 2017). Many studies suggest that internet addiction decreases self-esteem, social self-efficacy, and self-confidence (Baturay & Toker, 2019). Because of internet addiction, people are being destructed by their families, which may cause psychological and social problems (Mustafa et al., 2020). Unemployed people are addicted to the internet, and it indicates that they are less concerned about skill development (Rumpf et al., 2014). Problematic internet usage also hampers academic performance (Iyitoğlu & Çeliköz, 2017). This can also increase the percentage of unemployment.

Though COVID-19 was first detected in December 2019 in Wuhan, Hubei province, China (WHO,2020), it was first diagnosed on March 8, 2020, in Bangladesh (IECDR,2020). To prevent COVID-19 pandemic deaths and maintain social distance, schools and other institutions were closed throughout the pandemic until September 12, 2021 (Unicef, 2021). Because of this situation, the students had more opportunities to use the internet. But many students lost control of using the internet. So, it is necessary to find out the possible factors for internet addiction, and also the condition of mental health among students. Several studies were conducted in Bangladesh to find the prevalence of internet addiction or problematic internet use. The rate varies from 24% (Md. A. Islam & Hossin, 2016), 27.1% (Hassan et al., 2020), and 24% (Chandrima et al., 2020). The factors responsible for internet addiction can be defined as smartphone addiction, Facebook addiction (Jahan et al., 2021), depression, and anxiety (al Mamun et al., 2021). Wu et al. (2015) also found that people who are addicted to the internet may be more likely to try to kill themselves and have mental health problems. The purpose of this study was to cover the southern part of Bangladesh as little research has been conducted in this area. The study was conducted to find out the characteristics of the students and the effect of the internet on their daily lives as well as the status of their mental health issues.

Materials and Methods

The study was conducted among the university students in southern part of Bangladesh through convenience sampling from May 2021 to July 2021. The required sample size was 378 determined using Morgan expression formula for the approximate population size 27,500. The formula is expressed below-

$$s = \frac{\chi^2 NP(1-P)}{d^2(N-1) + \chi^2 P(1-P)}$$

About 385 students participated the survey. After handling missing values (37) and non-response rate (9.61%), we got the final sample size (348). Among them, 210 (60.3%) participants were male and 138 (39.7%) were female. The students of the universities who were tried to reach through online contributing an URL link of Google form to participate in the study.

Statistical analysis

We used Statistical Package for Social Science (Version 20.0) to analyze the Data. At first, the collected data were taken in SPSS using excel. The analysis contains univariate analysis (e.g. frequency distribution, percentages), bivariate analysis (Chi-square test) and multivariable analysis (regression analysis). Multinomial logistic regression analysis was conducted as multivariable analysis. 95% confidence interval was used to interpret the regression analysis.

Internet addiction test

A survey was conducted based on 20 questions to detect internet addiction that was developed by Young (Young, 1998). The questions include 5-point scales to each which is scaled as “0” (Never) to “5” (Always). The maximum range of the total score is 100. Based on the IAT manual, it can be categorized into Four categories: Normal Users (IAT \leq 30), Mild User (IAT= 31-49), Moderate User (IAT =50-79) and severe or excessive user (IAT \geq 80). As moderate internet users can hardly control the internet, they can be also categorized as Excessive Internet user. So, in the present study, we have divided the IAT total score into three categories: IAT(Score is 50+) and the other two categories are as follows Normal (Score belongs to 0 -30) and Mild (Score belongs to 31-49) (A. Islam & Hossin, 2016). An acceptable overall internal consistency was obtained for this sample (Chronbache’s alpha =0.787).

DASS

Anxiety and Stress-21 (DASS-21) contains three self-report which are- Depression, Anxiety and stress. Each of the three scales contains 7 items which was scored on a 4-point Likert scale 0 to 4. It actually shows the negative or emotional states (Lovibond & Lovibond, 1995) . Scores for the depression, Anxiety and Stress are calculated by summing the scores for the relevant items. (Henry & Crawford, 2005).

The three subscales were categorized into five ranges. For the depression scale, (scores \leq 4) are considered as normal, (5-6) as mild, (7-10) as moderate, (11-13) as severe and (scores \geq 14) as extremely severe. In the case of Anxiety, scores \leq 3 on the anxiety scale are considered as normal, 4-5 as mild, 6-7 as moderate, 8-9 as severe and those above 10 as extremely severe. For the stress scale, scores less than 7 are considered normal, 8-9 as mild, 10-12 as moderate, 13-16 as severe and scores greater than 17 as extremely severe[51, (Lovibond & Lovibond, 1995). As the mild category means less harmful behavior, we are considering it as normal category here and also considering severe and extremely severe as Severe category. A good overall internal consistency was found in the study (Chronbache’s alpha =0.842).

Ethical approval

Ethical approval was taken from Khulna University Research Cell (KURC).

Results

Table 1 describes the frequency distribution table of our variables. Among the total participants 60.3% were male and 39.7% were female. Most participants (57.2%) were from urban area and maximum participants belong to a middle-class family. Our analysis showed that 46.7% participants used internet for 15 years and above, and 51.3% participants prefer both home and universities for using internet. In case of mental health condition, the prevalence of having severe anxiety (51.4%) is higher compared to depression and stress. Our frequency distribution table also specified that more participants were moderate internet users with the prevalence rate 43.7%.

Table 2 describes the association between several covariates and internet addiction using chi-square test. Our bivariate analysis demonstrated that gender, permanent residence and mental health issues such as depression, anxiety and stress had significant association with internet addiction. Among severe internet addicted participants, 36.2% were male and 26.8% were female participants ($\chi^2 = 6.457$; p -value = 0.040). The prevalence of severe internet addiction is higher among urban participants compared to rural participants and the prevalence is 36.2% ($\chi^2 = 6.800$; p -value = 0.033). This study suggested that the participants who had severe mental health problems caused severe internet addiction. The prevalence of severe internet addiction among the participants who fulfilled severe depression criteria was 56.6%

($\chi^2 = 61.769$; p -value < 0.01). Similarly, the prevalence of severe anxiety and severe stress was 41.3% ($\chi^2 = 41.686$; p -value < 0.01), and 53.6% ($\chi^2 = 36.725$; p -value < 0.01) respectively.

Table1. Frequency distribution table of variables

Variables	Category	Frequency	Percentages
Gender	Male	210	60.3
	Female	138	39.7
Permanent Residence	Urban	199	57.2
	Rural	149	42.8
Perceived Socio-economic status	Low	29	8.33
	Middle	290	83.34
	High	29	8.33
Age at first internet use	Less than 5 years	43	12.4
	5-10 years	43	12.4
	10-15 years	99	28.5
	15 years and above	162	46.7
Preferable place	University	35	10.1
	Home	117	33.7
	Other places	17	4.9
	University & Home	178	51.3
Educational Usage	Yes	157	45.2
	No	190	54.8
Communicational Usage	Yes	128	36.9
	No	219	63.1
Earning sources	Yes	30	8.6
	No	317	91.4
Stress	Normal	201	57.8
	Moderate	78	22.4
	Severe	69	19.8
Anxiety	Normal	102	29.1
	Moderate	67	19.3
	Severe	179	51.4
Depression	Normal	104	29.9
	Moderate	145	41.7
	Severe	99	28.4
Internet Addiction	Normal	83	23.9
	Moderate	152	43.7
	Internet addicted	113	32.5

Table 3 shows the multinomial logistic regression analysis which was used to find out the impact of several associated risk factors associated with internet addiction simultaneously. Our analysis specified that age at the first internet use, preferable place for using internet, internet used for earning sources and the mental health condition such as- depression, anxiety, and stress showed a significant association with internet addiction. Our analysis demonstrated that the participants using internet for less than 5 years were 0.197 times less likely to have severe internet addiction compared to the participants who were using internet for 15 years and above. Preferable place for using internet also showed a significant association with moderate and severe internet addiction.

Table 2. Association between covariates and internet addiction

Covariates	Category	Internet addiction			Chi-square	p-value
		Normal n (%)	Moderate n (%)	Severe n (%)		
Gender	Male	41(19.5)	93(44.3)	76(36.2)	6.457	0.040
	Female	42(30.4)	59(42.8)	37(26.8)		
Permanent Residence	Urban	52(26.1)	75(37.7)	72(36.2)	6.800	0.033
	Rural	31(20.8)	77(51.7)	41(27.5)		
Socio-economic status	Low	6(20.7)	17(58.6)	6(20.7)	5.183	0.269
	Middle	73(25.2)	122(42.1)	95(32.8)		
	High	4(13.8)	13(44.8)	12(41.4)		
Age at first internet use	Less than 5	14(32.6)	21(48.8)	8(18.6)	9.794	0.134
	5-10 years	7(16.3)	22(51.2)	14(32.6)		
	10-15 years	20(20.2)	38(38.4)	41(41.4)		
	15 and above	42(25.9)	70(43.2)	50(30.9)		
Preferable place	University	13(37.1)	13(37.1)	9(25.7)	6.127	0.409
	Home	26(22.2)	49(41.9)	42(35.9)		
	Other places	6(35.3)	7(41.2)	4(23.5)		
	University & Home	38(21.3)	82(46.1)	58(32.6)		
Educational Usage	Yes	34(21.7)	72(45.9)	51(32.5)	0.977	0.614
	No	49(25.8)	79(41.6)	62(32.6)		
Communicational usage	Yes	30(23.4)	56(43.8)	42(32.8)	0.026	0.987
	No	53(24.2)	95(43.4)	71(32.4)		
Educational Usage	Yes	4(13.3)	12(40.0)	14(46.7)	3.637	0.162
	No	79(24.9)	139(43.8)	99(31.2)		
Depression	Normal	46(44.2)	40(38.5)	18(17.3)	61.769	<0.01
	Moderate	31(21.4)	75(51.7)	39(26.9)		
	Severe	6(6.1)	37(37.4)	56(56.6)		
Anxiety	Normal	43(42.2)	34(33.3)	25(24.5)	41.686	<0.01
	Moderate	21(31.3)	32(47.8)	14(20.9)		
	Severe	19(10.6)	86(48.0)	74(41.3)		
Stress	Normal	68(33.8)	86(42.8)	47(23.4)	36.725	<0.01
	Moderate	11(14.1)	38(48.7)	29(37.2)		
	Severe	4(5.8)	28(40.6)	37(53.6)		

Table 3: Multinomial logistic regression estimates of several categorical variables

Factors	Moderate				Internet addiction			
	RRR	95% CI		P	RRR	95% CI		P
		<i>Lower</i>	<i>Upper</i>			<i>Lower</i>	<i>Upper</i>	
Gender								
Male	1.4	0.704	2.780	0.337	1.359	0.630	2.931	0.434
Female	Reference							
Permanent Residence								
Urban	0.505	0.251	1.013	0.054	0.825	0.374	1.819	0.633
Rural	Reference							
Socio-Economic Status of family								
Low	1.483	0.223	9.857	0.684	0.441	0.048	4.054	0.469
Middle	0.988	0.233	4.180	0.985	1.187	0.250	5.642	0.829
High	Reference							
Relationship Status								
Single	1.266	0.242	6.610	0.780	1.602	0.214	11.987	0.647
Relationship	1.938	0.325	11.548	0.467	3.242	0.385	27.317	0.279
Married	Reference							
Age at first internet use								
< 5 years	0.397	0.140	1.122	0.081	0.197	0.053	0.727	0.015
5 - 10 years	0.851	0.256	2.834	0.793	0.523	0.137	1.998	0.343
10 - 15 years	0.674	0.300	1.514	0.340	0.915	0.382	2.195	0.843
15 years and above	Reference							
Preferred place								
University	0.243	0.081	0.734	0.012	0.222	0.061	0.811	0.023
Home	0.528	0.246	1.133	0.101	0.940	0.409	2.160	0.884
Other places	0.186	0.042	0.825	0.027	0.264	0.045	1.532	0.138
University & Home	Reference							
Most cases where internet is used								
Education								
Yes	1.084	0.538	2.182	0.822	1.147	0.532	2.473	0.727
No	Reference							
Communication								
Yes	0.835	0.407	1.714	0.623	0.867	0.390	1.928	0.727
No	Reference							

Earning Sources								
Yes	4.255	0.974	18.590	0.049	5.531	1.210	25.280	0.027
No	Reference							
Depression								
Normal	0.416	0.122	1.420	0.162	0.078	0.021	0.289	<0.01
Moderate	0.637	0.213	1.903	0.419	0.198	0.065	0.608	0.005
Severe	Reference							
Anxiety								
Normal	0.183	0.069	0.485	0.001	0.325	0.112	0.942	0.038
Moderate	0.350	0.136	0.900	0.029	0.310	0.106	0.904	0.032
Severe	Reference							
Stress								
Normal	0.377	0.105	1.344	0.132	0.244	0.065	0.913	0.036
Moderate	0.779	0.194	3.126	0.725	0.558	0.132	2.352	0.426
Severe	Reference							

The participants who preferred university for using internet were 0.243 and 0.222 times less likely to be moderate and severe internet addicted respectively compared to the participants who preferred both home and university. Moreover, participants who prefer other places rather than home and university for using internet were 0.186 times less likely to have moderate internet addiction compared to the respondents who preferred both home and university.

Again, the participants who used internet more for earning sources were 4.255 and 5.531 more likely to develop moderate and severe internet addiction compared to the respondents who did not use for earning source. This covariate had significant association with internet addiction.

The several categories of mental health condition such as depression, anxiety, and stress showed a significant association with internet addiction. In case of depression, normal participants were 7.8% less likely to be severely addicted to internet compared to participants who had severe depression. Again, participants having moderate depression were 19.8% less likely to have severe internet addiction compared to severe ones. In case of anxiety, normal participants were 18.3% and 11.2% less likely to develop both moderate and severe internet addiction respectively compared to the severe ones. Similarly, moderate participants also had significant association with moderate and severe internet addiction. The another most important category of mental health condition named as stress also had a significant association with severe internet addiction. It specified that normal participants were 0.244 times less likely to develop severe internet addiction compared to severe stressed participants.

Discussion

Our study investigates the associated risk factors of internet addiction during covid-19 pandemic situation.

Our bivariate analysis suggested that male participants caused both moderate and severe internet addiction compared to female participants. Several studies also support this statement (Tsai et al., 2009). During covid-19 pandemic situation, the academic curriculum was interrupted and that's why they had enough time without doing nothing. That's why they spent more time on internet and lost the control on it. Another significant factor found by bivariate analysis is permanent residence. Our study showed that participants whose residence was in urban were more addicted on internet. This situation arose because of the availability and scope of using internet and inadequate concern on internet addiction. We conducted multivariable analysis to find the

Sara, S. S. et al. (2022). Association and impact of several risk factors of internet addiction during covid-19 pandemic among university students in the southern part of Bangladesh y. *Khulna University Studies*, Special Issue (ICSTEM4IR): 432-442.

effect of several risk factors simultaneously and also to find the estimates of the factors. Our multinomial logistic regression analysis suggested that the participant who are using internet less than 5 years are at risk of addicted to internet. This can happen because participants who are new internet users had enough time to spend on internet during covid-19 situation. And as they had little knowledge about internet addiction and lost control on them, they became addicted to internet.

Our analysis also specified that depression had significant association with internet addiction. More depressed participants had more chances of becoming addicted to internet (Young & Rogers, 1998) (Dong et al., 2020). It may happen because of unpredictable life during covid-19 pandemic. Participants got more depressed because of getting news of innumerable deaths related with covid-19. Another important mental health condition is anxiety. This study was also found significant association of anxiety with internet addiction. As internet addiction means more time is spent online, the news related covid-19 and its unbeatable condition might increase the risk of anxiety among participants (Eidi & Delam, 2020) (Khubchandani et al., 2021). Stress is another influencing mental health condition which was identified as positively correlated with internet addiction (Hamami et al., 2022) because of going through a stressful lockdown because of covid-19 pandemic. From the above discussion it can be said that several factors specifically mental health issues were responsible for internet addiction (Radeef & Faisal, 2018).

Limitations

Additionally, this study has several drawbacks. As we conducted the survey with self-reported data, the findings might be influenced by the student's behavior, the method biases and memory recall biases. Relatively small sample size and study location (Southern part) might influence the result. Because we can't generalize the results for the whole country. In the future studies, the limitations should be tried to overcome by using larger representative samples and wider region.

Conclusion

This study included the university students of the southern part of Bangladesh to find out the possible associated factors for internet addiction. This study suggests that fresher internet users are more likely to be addicted on internet. Another possible factor is the cases for using internet. Participants who are using internet for earning purposes may get addicted more on internet. Our study demonstrates that depression, anxiety, and stress are positively correlated with internet addiction. The participants who are facing mental health problems are at a higher risk of getting addicted to internet. So, this study suggests a sound knowledge about internet addiction and its side effects. People should also be aware of its several factors especially mental health condition should be maintained properly and carefully to avoid the risk of getting addicted to internet.

Acknowledgement

We are thankful to all the university students of the southern part of Bangladesh who participated in our study. We are also thankful to the Khulna University Research Cell (KURC) for providing ethical approval for this study.

References

- al Mamun, F., Hosen, I., Misti, J. M., Kaggwa, M. M., & Mamun, M. A. (2021). Mental Disorders of Bangladeshi Students During the COVID-19 Pandemic: A Systematic Review. *Psychology Research and Behavior Management*, 14, 645–654. <https://doi.org/10.2147/PRBM.S315961>
- Baturay, M. H., & Toker, S. (2019). Internet addiction among college students: Some causes and effects. *Education and Information Technologies*, 24(5), 2863–2885. <https://doi.org/10.1007/s10639-019-09894-3>
- Bukhari, S. A. (2021). *Sample Size Determination Using Krejcie and Morgan Table*. <https://doi.org/10.13140/RG.2.2.11445.19687>

- Cao, F., & Su, L. (2007). Internet addiction among Chinese adolescents: Prevalence and psychological features. *Child: Care, Health and Development*, 33(3), 275–281. <https://doi.org/10.1111/j.1365-2214.2006.00715.x>
- Chandrima, R. M., Kircaburun, K., Kabir, H., Riaz, B. K., Kuss, D. J., Griffiths, M. D., & Mamun, M. A. (2020). Adolescent problematic internet use and parental mediation: A Bangladeshi structured interview study. *Addictive Behaviors Reports*, 12, 100288. <https://doi.org/10.1016/j.abrep.2020.100288>
- Chowdhury, A. T., Siddiqua, S. R., Rahman, L., Hossian, M., & Nabi, M. H. (2022). *Internet addiction during COVID-19 restricted movement period: A cross-sectional study from Bangladesh* (11:519). F1000Research. <https://doi.org/10.12688/f1000research.108664.1>
- COVID-19 General Information. (n.d.). IEDCR. Retrieved April 17, 2022, from <https://iedcr.gov.bd/covid-19/covid-19-general-information>
- De Vries, H. T., Nakamae, T., Fukui, K., Denys, D., & Narumoto, J. (2018). Problematic internet use and psychiatric co-morbidity in a population of Japanese adult psychiatric patients. *BMC Psychiatry*, 18(1), 9. <https://doi.org/10.1186/s12888-018-1588-z>
- Dong, H., Yang, F., Lu, X., & Hao, W. (2020). Internet Addiction and Related Psychological Factors Among Children and Adolescents in China During the Coronavirus Disease 2019 (COVID-19) Epidemic. *Frontiers in Psychiatry*, 11. <https://www.frontiersin.org/article/10.3389/fpsy.2020.00751>
- Eidi, A., & Delam, H. (2020). Internet addiction is likely to increase in home quarantine caused by coronavirus disease 2019 (COVID 19). *Journal of Health Sciences & Surveillance System*, 8(3), 142–143. <https://doi.org/10.30476/jhsss.2020.87015.1104>
- Hamami, M., Aziz, G. G. A., & Sa'id, M. (2022). Stress and Internet Addiction in College Students During the COVID-19 Pandemic. *KnE Social Sciences*, 297–309. <https://doi.org/10.18502/kss.v7i1.10219>
- Hassan, T., Alam, M. M., Wahab, A., & Hawlader, M. D. (2020). Prevalence and associated factors of internet addiction among young adults in Bangladesh. *Journal of the Egyptian Public Health Association*, 95(1), 3. <https://doi.org/10.1186/s42506-019-0032-7>
- Henry, J. D., & Crawford, J. 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. *British Journal of Clinical Psychology*, 44(2), 227–239. <https://doi.org/10.1348/014466505X29657>
- Islam, A., & Hossin, M. Z. (2016). Prevalence and risk factors of problematic internet use and the associated psychological distress among graduate students of Bangladesh. *Asian Journal of Gambling Issues and Public Health*, 2016, 1–14. <https://doi.org/10.1186/s40405-016-0020-1>
- Islam, Md. A., & Hossin, M. Z. (2016). Prevalence and risk factors of problematic internet use and the associated psychological distress among graduate students of Bangladesh. *Asian Journal of Gambling Issues and Public Health*, 6(1), 11. <https://doi.org/10.1186/s40405-016-0020-1>
- Iyitoğlu, O., & Çeliköz, N. (2017). EXPLORING THE IMPACT OF INTERNET ADDICTION ON ACADEMIC ACHIEVEMENT. *European Journal of Education Studies*, 0, Article 0. <https://doi.org/10.46827/ejes.v0i0.624>
- Jahan, I., Hosen, I., al Mamun, F., Kaggwa, M. M., Griffiths, M. D., & Mamun, M. A. (2021). How Has the COVID-19 Pandemic Impacted Internet Use Behaviors and Facilitated Problematic Internet Use? A Bangladeshi Study. *Psychology Research and Behavior Management*, 14, 1127–1138. <https://doi.org/10.2147/PRBM.S323570>
- Khubchandani, J., Sharma, S., & Price, J. H. (2021). COVID-19 Pandemic and the Burden of Internet Addiction in the United States. *Psychiatry International*, 2(4), 402–409. <https://doi.org/10.3390/psychiatryint2040031>
- Kuss, D. J., Griffiths, M. D., & Binder, J. F. (2013). Internet addiction in students: Prevalence and risk factors. *Computers in Human Behavior*, 29(3), 959–966. <https://doi.org/10.1016/j.chb.2012.12.024>
- Laconi, S., Kaliszewska-Czeremska, K., Gnisci, A., Sergi, I., Barke, A., Jeromin, F., Groth, J., Gamez-Guadix, M., Ozcan, N. K., Demetrovics, Z., Király, O., Siomos, K., Floros, G., & Kuss, D. J. (2018). Cross-cultural study of Problematic Internet Use in nine European countries. *Computers in Human Behavior*, 84, 430–440. <https://doi.org/10.1016/j.chb.2018.03.020>

Sara, S. S. et al. (2022). Association and impact of several risk factors of internet addiction during covid-19 pandemic among university students in the southern part of Bangladesh y. *Khulna University Studies*, Special Issue (ICSTEM4IR): 432-442.

- Lam, L. T. (2014). Internet gaming addiction, problematic use of the Internet, and sleep problems: A systematic review. In *Current Psychiatry Reports* (Vol. 16, Issue 4). Current Medicine Group LLC 1. <https://doi.org/10.1007/s11920-014-0444-1>
- Liang, L., Li, C., Meng, C., Guo, X., Lv, J., Fei, J., & Mei, S. (2022). Psychological distress and internet addiction following the COVID-19 outbreak: Fear of missing out and boredom proneness as mediators. *Archives of Psychiatric Nursing*. <https://doi.org/10.1016/j.apnu.2022.03.007>
- Lin, M.-P. (2020). Prevalence of Internet Addiction during the COVID-19 Outbreak and Its Risk Factors among Junior High School Students in Taiwan. *International Journal of Environmental Research and Public Health*, 17(22), 8547. <https://doi.org/10.3390/ijerph17228547>
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335–343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)
- Mak, K.-K., Lai, C.-M., Watanabe, H., Kim, D.-I., Bahar, N., Ramos, M., Young, K. S., Ho, R. C. M., Aum, N.-R., & Cheng, C. (2014). Epidemiology of Internet Behaviors and Addiction Among Adolescents in Six Asian Countries. *Cyberpsychology, Behavior, and Social Networking*, 17(11), 720–728. <https://doi.org/10.1089/cyber.2014.0139>
- Mustafa, M. Y., Rose, N. N., & Ishak, A. S. (2020). Internet Addiction and Family Stress: Symptoms, Causes and Effects. *Journal of Physics: Conference Series*, 1529(3), 032017. <https://doi.org/10.1088/1742-6596/1529/3/032017>
- Onukwuli, V. O., Udigwe, I. B., Enebe, N. O., Umeh, U. M., & Enebe, J. T. (2022). 135. Internet Addiction Among Adolescents in South East Nigeria During COVID 19 Pandemic – Implications for Adolescent Care in the Post Pandemic Era. *Journal of Adolescent Health*, 70(4, Supplement), S71–S72. <https://doi.org/10.1016/j.jadohealth.2022.01.052>
- Radeef, A. S., & Faisal, G. G. (2018). Prevalence of Internet Addiction and its association with depression, anxiety and stress among Medical Students in Malaysia. *Mediterranean Journal of Clinical Psychology*, 6(3), Article 3. <https://doi.org/10.6092/2282-1619/2018.6.1987>
- Rumpf, H.-J., Vermulst, A. A., Bischof, A., Kastirke, N., Gürtler, D., Bischof, G., Meerkerk, G.-J., John, U., & Meyer, C. (2014). Occurrence of Internet Addiction in a General Population Sample: A Latent Class Analysis. *European Addiction Research*, 20(4), 159–166. <https://doi.org/10.1159/000354321>
- Sarialioğlu, A., Atay, T., & Arıkan, D. (2022). Determining the relationship between loneliness and internet addiction among adolescents during the covid-19 pandemic in Turkey. *Journal of Pediatric Nursing*, 63, 117–124. <https://doi.org/10.1016/j.pedn.2021.11.011>
- Servidio, R., Bartolo, M. G., Palermi, A. L., & Costabile, A. (2021). Fear of COVID-19, depression, anxiety, and their association with Internet addiction disorder in a sample of Italian students. *Journal of Affective Disorders Reports*, 4, 100097. <https://doi.org/10.1016/j.jadr.2021.100097>
- Shek, T. L., Sun, R. C. F., & Yu, L. (2013). Internet addiction. In *Neuroscience in the 21st Century* (pp. 2775–2811). Springer New York. https://doi.org/10.1007/978-1-4614-1997-6_108
- Siste, K., Hanafi, E., Sen, L. T., Christian, H., Adrian, Siswidiani, L. P., Limawan, A. P., Murtani, B. J., & Suwartono, C. (2020). The Impact of Physical Distancing and Associated Factors Towards Internet Addiction Among Adults in Indonesia During COVID-19 Pandemic: A Nationwide Web-Based Study. *Frontiers in Psychiatry*, 11. <https://www.frontiersin.org/article/10.3389/fpsy.2020.580977>
- The future of 37 million children in Bangladesh is at risk with their education severely affected by the COVID-19 pandemic.* (n.d.). Retrieved April 17, 2022, from <https://www.unicef.org/bangladesh/en/press-releases/future-37-million-children-bangladesh-risk-their-education-severely-affected-covid>
- Tsai, H. F., Cheng, S. H., Yeh, T. L., Shih, C.-C., Chen, K. C., Yang, Y. C., & Yang, Y. K. (2009). The risk factors of Internet addiction—A survey of university freshmen. *Psychiatry Research*, 167(3), 294–299. <https://doi.org/10.1016/j.psychres.2008.01.015>
- Weinstein, A., & Lejoyeux, M. (2010). Internet Addiction or Excessive Internet Use. *The American Journal of Drug and Alcohol Abuse*, 36(5), 277–283. <https://doi.org/10.3109/00952990.2010.491880>

