Impact of COVID-19 on Academic and Psychological aspects of Undergraduate Students in Bangladesh: A Case Study

Md. Mortuza Ahmmed, M. Mostafizur Rahman, Abhijit Bhowmik, Ayesha Siddiqua

Abstract—**Undergraduate students are considered susceptible in terms of anxiety, drug abuse, depression, and bad dietary habits in comparison to the general people. Their academic and psychological facets have severely been altered due to COVID-19 pandemic. The objective of this study is to identify the effect of COVID-19 on the academic and psychological aspects of undergraduate students in Bangladesh accompanied by other pertinent factors. Data were accumulated from the undergraduate students of the Fall semester 2020-21 of American International University-Bangladesh (AIUB) by questionnaire provided through Microsoft Forms. The associations among the variables were assessed through the chi-square test. All the statistical analyses required to meet the goals of the study were done through Statistical Package for Social Sciences (SPSS). Nearly one-fourth of the students suffered from anxiety and depression at an extreme level while close to one-third of them suffered quite a bit signaling a tormenting psychological state of the students. Chi-square tests found that depression, anxiety, study hour, assessment of online learning, and income issue due to COVID-19 of the student had a highly significant association with effects on their study and psychological aspects. Failure to address the aforesaid issues during an epidemic might have negative consequences on the academic and psychological aspects in the long run.**

Index Terms—**Anxiety, Chi-square test, COVID-19, CGPA, depression, MICS.**

Md. Mortuza Ahmmed
Assistant Professor,
Department of Mathematics,
American International university Bangladesh
Email: mortuza@aiub.edu

M. Mostafizur Rahman
Associate Professor,
Department of Mathematics,
American International university Bangladesh
Email: mostafiz.math@aiub.edu

Abhijit Bhowmik
Associate Professor,
Department of Computer Science,
American International university Bangladesh
Email: abhijit@aiub.edu

Ayesha Siddiqua
Assistant Professor,
Department of Mathematics,
American International university Bangladesh
Email: ayesha.siddiqua@aiub.edu

I. INTRODUCTION

COVID-19 epidemic has affected virtually every segment of our life including education sector as well. All types of educational institutions have been experiencing impromptu stoppages all over the world since the arrival of COVID-19 and its lingering existence accompanied by responsive measures like quarantine, social distancing, isolation, lockdown etc. are worsening the situation. It has been revealed through a cross-sectional study based on 505 college and university students that economic insecurity, infection concern, insufficient supply of food, no re-creational activity as well as physical exercise had statistically significant association with the psychological aspects of the students [1]. A separate study has shown that people being circumscribed in seclusion may suffer from different types of psychological predicaments [2]. Anxiety and depression concerning COVID-19 have been detected to cause devastating strain for all [3, 4]. Fear regarding the negative consequences of COVID-19 on economy and everyday life together with concern about academic interruptions have been found to be significantly associated with anxiety level of the students [5]. Students in developing countries have found it quite challenging in swapping to online education system, accustoming with the online evaluation procedures, collaborating with their teachers, accessibility of electronic devices and internet and accompanying cost [6]. A cross-sectional study based on 217 private medical college students in Bangladesh has found that over 70% of the respondents have negative feeling concerning the effectiveness of the ongoing online education [7]. Identical results have also been found in a separate study based on 50 students from both public and private universities in Bangladesh [8].

The adjournment in educational institutions would have negative consequence both on the psychological and academic status of the students [9]. A separate study has revealed that students with lower income have higher probability of delaying their graduation than those with higher income because of the economic consequences caused by the COVID-19 [10]. Financial inequality has been noticed to have significant impact on students' access to online education [11]. Education of students coming from downgraded economic status have suffered the most since the arrival of COVID-19 in Bangladesh [12]. According to Multiple Indicator Cluster

Survey (MICS) 2019, close to 5% families in Bangladesh do not have a mobile phone whereas nearly half of them do not have a television. Besides, merely 5.6% families possess a computer while about 37% have internet access at home which is further restricted for females in most of the households due to the male dominated family compositions in the country [13]. A different study based on students from selected public universities have also revealed that majority of the students have suffered in terms of education, income and psychology as a consequence of COVID-19 in Bangladesh [14]. Also, the online education system has been found to be more difficult to catch than the traditional one for most of the students as well [15].

Students who regularly search for information concerning COVID-19 issues have been identified not only to experience higher depression and anxiety levels but also to lose concentration on their academic activities [16]. Analytical results of a study based on 195 public university students in the USA have revealed that personal health concern, academic interruptions, sleeping instabilities, social distancing, and fear about academic results are the crucial factors of anxiety and depression of the students during COVID-19 [17]. Almost similar findings have been observed in a qualitative study based on nursing students as well [18].

It is important to investigate the academic and psychological experience of the university students in Bangladesh during the COVID-19 epidemic given the unanticipated surroundings. This study has been intended to identify these academic and psychological crises. The objective of this study is to address the impact of COVID-19 on the academic and psychological aspects among the students at tertiary level in Bangladesh along with other relevant determinants.

II. Methodology

Primary data for the study were assembled from the undergraduate students of the Fall semester 2020-21 of American International University-Bangladesh (AIUB). A self-directed questionnaire was developed at the beginning which was finalized only after being pretested on a sample of 50 students encircling various faculties. Almost 10000 students are there in AIUB under different faculties. Initially, a sample of size 1650 was estimated considering 2.2% margin of error at 95% confidence interval [19]. Anticipating 5% non-response rate, the final sample size was adjusted as:

Final sample size
= (Initial sample size)/(1-Anticipated non-response rate)= $1650/(1-0.05) \approx 1737$
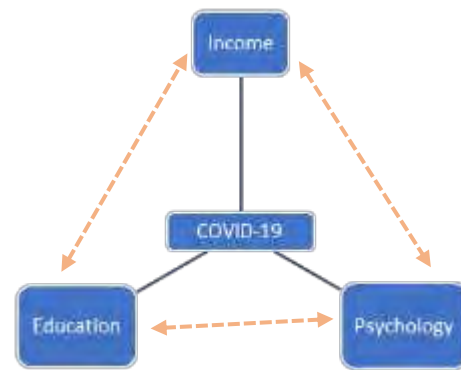

Figure 1: Conceptual framework

A total of 44 classes were selected by simple random sampling technique covering all the faculties, namely, Faculty of Arts and Social Sciences (FASS), Faculty of Business Administration (FBA), Faculty of Engineering (FE), and Faculty of Science & Technology (FST). Each of the classes had 40 students on average resulting in a total of 1760 students. They were asked to give response to the relevant questionnaire provided through Microsoft Forms. Exactly 1715 students turned in with complete response indicating a non-response rate of nearly 2.6%.

Several variables related to the study objective were considered like gender, area of residence, age, depression, anxiety, effects on study and income due to COVID-19, study hour, online learning hour, rating of online learning, COVID-19 experience of the student as well as any of his/her family member, and any death case in the family from COVID-19. The association among the variables were assessed by applying chi-square test, where p-value ≤ 0.05 indicated significant association and p-value ≤ 0.01 indicated highly significant association. All the statistical analyses required to meet the goals of the study were accomplished through Statistical Package for Social Sciences (SPSS) - version 20.0.

III. Results and Discussion

The background characteristics of the respondents are illustrated in Table 1 below:

TABLE I
DISTRIBUTION OF RESPONDENTS BY BACKGROUND CHARACTERISTICS

		Frequency	Percentage
Gender	Female	382	22.3
	Male	1333	77.7
Age	18-20	284	16.6
	20-22	899	52.4
	22-24	461	26.9
	>24	71	4.1
Area of residence	Urban	1257	73.3
	Rural	458	26.7
Study affected	Considerably	471	27.5
	Greatly	496	28.9
	Moderately	459	26.8
	Not affected at all	102	5.9
	Slightly	187	10.9
Study hour	<2	436	25.4
	2-4	672	39.2
	4-6	426	24.8
	6-8	115	6.7

	>8	66	3.8
	<2	240	14.0
	2-4	416	24.3
Online learning hour	4-6	591	34.5
	6-8	356	20.8
	>8	112	6.5
	1	221	12.9
	2	335	19.5
Online learning rating	3	731	42.6
	4	317	18.5
	5	111	6.5
	A little bit	177	10.3
	Extreme	415	24.2
Anxiety level	Moderate	495	28.9
	Not at all	48	2.8
	Quite a bit	580	33.8
	A little bit	188	11.0
	Extreme	475	27.7
Depression level	Moderate	375	21.9
	Not at all	125	7.3
	Quite a bit	552	32.2
	Considerably	457	26.6
	Greatly	537	31.3
Income affected	Moderately	365	21.3
	Not at all	143	8.3
	Slightly	213	12.4
Self-positive	No	1525	88.9
	Yes	190	11.1
Family member positive	No	1136	66.2
	Yes	579	33.8
Family member death	No	1553	90.6
	Yes	162	9.4

The gender ratio of the students was 3.48 ∶ 1 signifying the preeminence of male students at AIUB. More than half of the students (52.4%) were aged between 20 to 22 years. Figure 1 highlights the distributions of students by age and gender more evidently.

As expected, the majority of them (73.3%) came from urban areas since tertiary education is an expensive deal in private universities in Bangladesh and is beyond reach of most of the limited stipendiary rural citizens. Distributions of how COVID-19 affected the students are displayed in figure 2.

A significant proportion of them (83.2%) responded that their academic study was affected to an extent due to COVID-19. Around one fourth of the students were observed to study in both less than 2 hours and 4 to 6 hours category while close to 40% were found to study between 2 to 4 hours on average per day. Around one third of them used to spend 2 to 4 hours in online learning on average per day while nearly 43% of them rated the online learning as average. Distributions of students by study hour and online learning can be observed through fig 3.

Close to one fourth of the students admitted suffering from anxiety at extreme level while little over one third of them suffered quite a bit. Almost matching outcomes were obtained for depression level as well signaling a tormenting psychological state of the students. Distributions of students by anxiety and depression are exhibited in figure 4.

Family income of more than 90% of the students was affected due to COVID-19 to some extent. Around 11% of the students found themselves to be COVID-19 positive. For one third of the students, any of their family members were reported as COVID-19 positive of which just over 9% cases
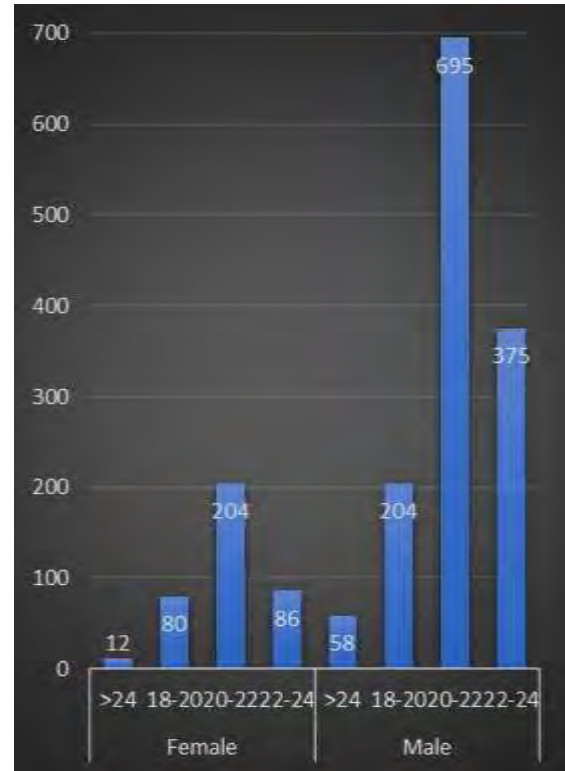
resulted in death.

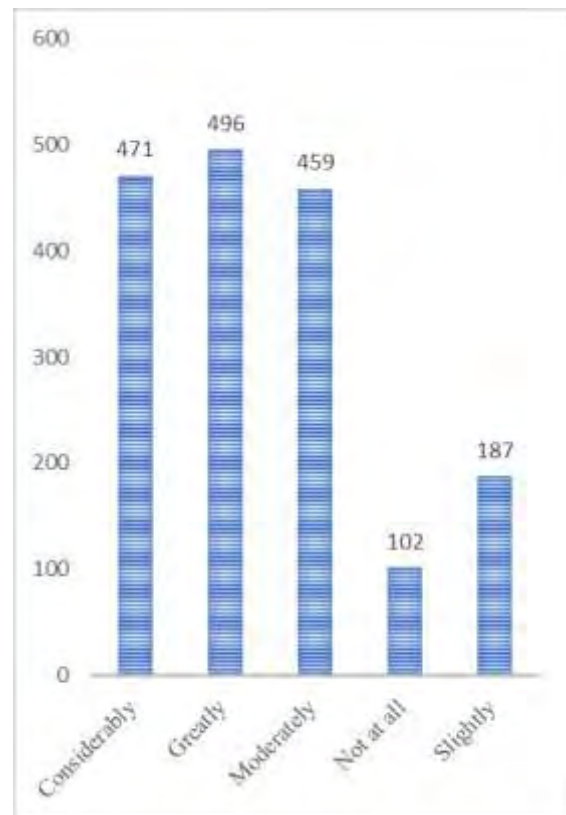Fig. 1. Distributions of students by age and gender

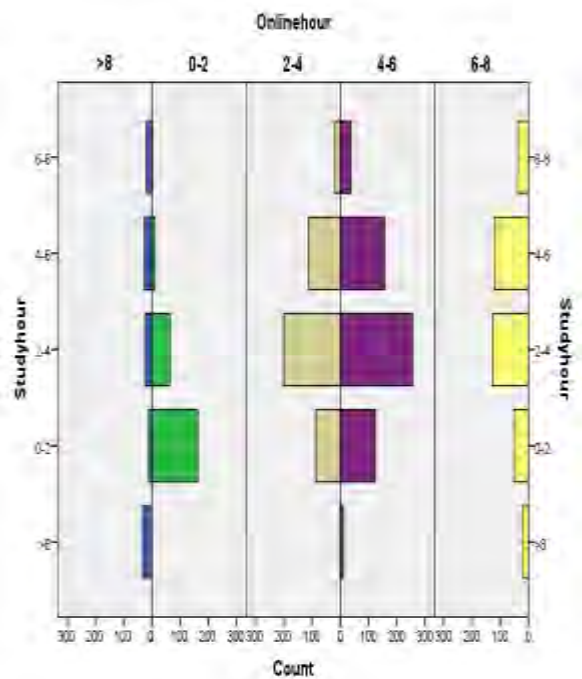Fig. 2. Distributions of how COVID-19 affected the students

Fig. 3. Distributions of students by study hour and online learning

The association between the effects on study due to COVID-19 and the selected variables can be observed in Table 2. The analytical results of chi-square tests show that variables like depression, anxiety, study hour, rating of online learning, effects on income due to COVID-19 and COVID-19 experience of the student had highly significant association with effects on study (p-value ≤ 0.01) while COVID-19 experience of any of his/her family member and any death case in the family from COVID-19 had significant association (p-value ≤ 0.05).

The association between the depression level of the students and the selected variables can be observed in Table 3. The analytical results of chi-square tests show that variables like gender, effects on study and income due to COVID-19, anxiety, rating of online learning, and COVID-19 experience of the student as well as any of his/her family member had highly significant association with depression level of the students (p-value ≤ 0.01) while online learning and area of residence had significant association (p-value ≤ 0.05).

The association between the effects on study due to COVID-19 and the selected variables can be observed in Table 4. The findings are almost similar to what are observed in Table 3.
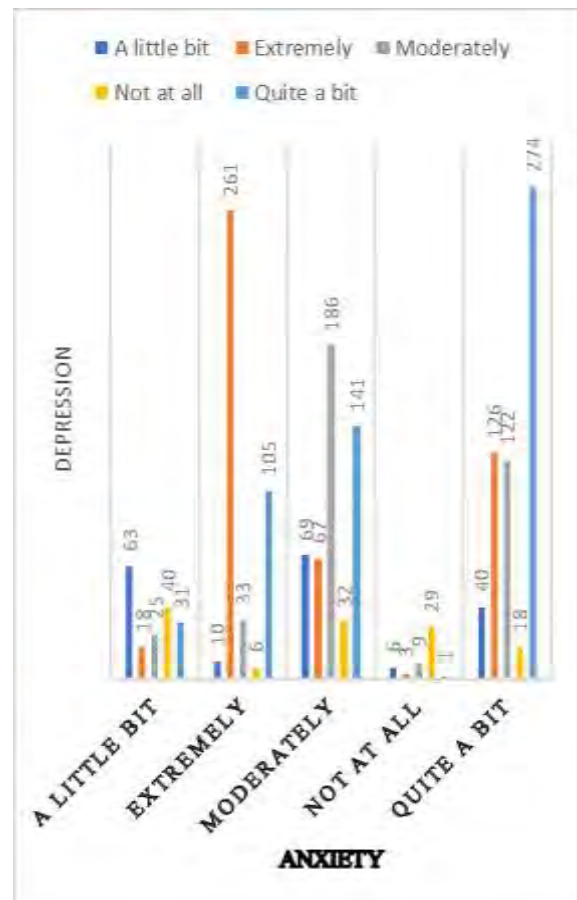
Fig. 4. Distributions of students by anxiety and depression

TABLE II
DISTRIBUTION OF RESPONDENTS BY ACADEMIC AFFECT FROM COVID-19 AND COVARIATES

		Study affected					Significance
		Considerably	Greatly	Moderately	Not at all	Slightly	
Gender	Female	107	114	97	18	46	$\chi^2 = 2.38$ p-value = 0.66
	Male	364	382	362	84	141	
Age	18-20	77	82	74	17	34	$\chi^2 = 6.99$ p-value = 0.85
	20-22	254	262	237	54	92	
	22-24	123	133	131	23	51	
	>24	17	19	17	8	10	
Area of residence	Urban	356	346	351	70	134	$\chi^2 = 8.18$ p-value = 0.08
	Rural	115	150	108	32	53	
Anxiety level	A little bit	33	34	44	25	41	$\chi^2 = 354.75$ p-value = 0.00
	Extremely	92	217	63	15	28	
	Moderately	122	79	203	25	66	
	Not at all	6	9	8	17	8	
	Quite a bit	218	157	141	20	44	
Study hour	0-2	136	153	89	25	33	$\chi^2 = 52.55$ p-value = 0.00
	2-4	182	187	197	27	79	
	4-6	97	115	131	27	56	

						Significance
	6-8	35	26	28	14	12	
	>8	21	15	14	9	7	
	0-2	67	86	55	11	21	
Online learning hour	2-4	102	119	117	28	50	$\chi^2 = 20.23$ p-value = 0.21
	4-6	170	153	165	33	70	
	6-8	101	101	101	19	34	
	>8	31	37	21	11	12	
Online learning rating	1	52	131	24	7	7	$\chi^2 = 360.56$ p-value = 0.00
	2	104	131	64	12	24	
	3	216	170	238	31	76	
	4	81	45	110	16	65	
	5	18	19	23	36	15	
Depression level	A little bit	37	19	61	23	48	$\chi^2 = 358.97$ p-value = 0.00
	Extremely	115	254	67	11	28	
	Moderately	96	65	146	22	46	
	Not at all	22	18	37	25	23	
	Quite a bit	201	140	148	21	42	
	Considerably	173	104	122	20	38	
Income affected	Greatly	127	246	104	25	35	$\chi^2 = 201.47$ p-value = 0.00
	Moderately	96	81	130	13	45	
	Not at all	27	30	40	22	24	
	Slightly	48	35	63	22	45	
Self-positive	No	420	420	419	94	172	$\chi^2 = 14.56$ p-value = 0.00
	Yes	51	76	40	8	15	
Family member positive	No	304	311	313	77	131	$\chi^2 = 9.28$ p-value = 0.05
	Yes	167	185	146	25	56	
Family member Death	No	427	434	423	92	177	$\chi^2 = 10.48$ p-value = 0.03
	Yes	44	62	36	10	10	

							Significance
	4-6	44	106	123	12	141	p-value = 0.45
	6-8	12	31	37	2	33	
	>8	9	17	21	1	18	
	0-2	33	62	49	11	85	
Online learning hour	2-4	37	85	133	13	148	$\chi^2 = 28.80$ p-value = 0.02
	4-6	57	140	175	13	206	
	6-8	35	90	112	9	110	
	>8	15	38	26	2	31	
Online learning rating	1	15	112	36	9	49	$\chi^2 = 144.87$ p-value = 0.00
	2	33	84	81	7	130	
	3	67	130	254	17	263	
	4	38	59	96	10	114	
	5	24	30	28	5	24	
Depression level	A little bit	63	10	69	6	40	$\chi^2 = 843.94$ p-value = 0.00
	Extremely	18	261	67	3	126	
	Moderately	25	33	186	9	122	
	Not at all	40	6	32	29	18	
	Quite a bit	31	105	141	1	274	
	Considerably	33	112	135	7	170	
Income affected	Greatly	47	188	120	13	169	$\chi^2 = 108.58$ p-value = 0.00
	Moderately	32	59	130	10	134	
	Not at all	23	25	47	10	38	
	Slightly	42	31	63	8	69	
Self-positive	No	161	350	451	42	521	$\chi^2 = 12.59$ p-value = 0.01
	Yes	16	65	44	6	59	
Family member positive	No	131	250	340	40	375	$\chi^2 = 19.71$ p-value = 0.00
	Yes	46	165	155	8	205	
Family member Death	No	163	368	450	43	529	$\chi^2 = 2.61$ p-value = 0.62
	Yes	14	47	45	5	51	

TABLE III
DISTRIBUTION OF RESPONDENTS BY ANXIETY DUE TO COVID-19 AND COVARIATES

		Anxiety level					Significance
		A little bit	Extreme	Moderate	Not at all	Quite a bit	
Gender	Female	34	116	93	8	131	$\chi^2 = 13.07$ p-value = 0.01
	Male	143	299	402	40	449	
Age	18-20	37	60	85	9	93	$\chi^2 = 5.11$ p-value = 0.95
	20-22	87	223	263	26	300	
	22-24	46	114	128	11	162	
	>24	7	18	19	2	25	
Area of residence	Urban	122	290	362	33	450	$\chi^2 = 10.17$ p-value = 0.03
	Rural	55	125	133	15	130	
Study affected	Considerably	33	92	122	6	218	$\chi^2 = 354.75$ p-value = 0.00
	Greatly	34	217	79	9	157	
	Moderately	44	63	203	8	141	
	Not at all	25	15	25	17	20	
	Slightly	41	28	66	8	44	
Study hour	0-2	45	112	100	15	164	
	2-4	67	149	214	18	224	$\chi^2 = 16.07$

TABLE IV
DISTRIBUTION OF RESPONDENTS BY DEPRESSION DUE TO COVID-19 AND COVARIATES

		Depression level					Significance
		A little bit	Extreme	Moderate	Not at all	Quite a bit	
Gender	Female	35	141	72	16	118	$\chi^2 = 25.30$ p-value = 0.00
	Male	153	334	303	109	434	
Age	18-20	32	77	55	27	93	$\chi^2 = 8.72$ p-value = 0.73
	20-22	102	260	194	60	283	
	22-24	43	121	111	32	154	
	>24	11	17	15	6	22	
Area	Urban	126	342	296	90	403	$\chi^2 = 10.41$ p-value = 0.03
	Rural	62	133	79	35	149	
Study affected	Considerably	37	115	96	22	201	$\chi^2 = 358.97$ p-value = 0.00
	Greatly	19	254	65	18	140	
	Moderately	61	67	146	37	148	
	Not at all	23	11	22	25	21	
	Slightly	48	28	46	23	42	
Study hour	0-2	45	138	88	33	132	$\chi^2 = 14.83$ p-value = 0.53
	2-4	77	179	147	43	226	
	4-6	46	112	93	31	144	
	6-8	16	27	32	10	30	

	>8	4	19	15	8	20	
	0-2	30	64	58	18	70	
Online learning hour	2-4	53	108	88	34	133	χ^2 = 30.04 p-value = 0.02
	4-6	64	152	135	29	211	
	6-8	36	105	73	36	106	
	>8	5	46	21	8	32	
	1	10	118	29	13	51	
Online learning rating	2	29	116	59	17	114	χ^2 = 170.87 p-value = 0.00
	3	74	167	172	44	274	
	4	51	53	89	32	92	
	5	24	21	26	19	21	
	A little bit	63	18	25	40	31	
Anxiety level	Extremely	10	261	33	6	105	χ^2 = 843.94 p-value = 0.00
	Moderately	69	67	186	32	141	
	Not at all	6	3	9	29	1	
	Quite a bit	40	126	122	18	274	
	Considerably	39	121	108	15	174	
Income affected	Greatly	39	225	77	24	172	χ^2 = 214.96 p-value = 0.00
	Moderately	36	72	117	25	115	
	Not at all	34	22	31	22	34	
	Slightly	40	35	42	39	57	
Self-positive	No	172	402	336	115	500	χ^2 = 13.05 p-value = 0.01
	Yes	16	73	39	10	52	
Family member positive	No	134	269	263	97	373	χ^2 = 31.93 p-value = 0.00
	Yes	54	206	112	28	179	
Family member Death	No	172	405	348	119	509	χ^2 = 2.61 p-value = 0.62
	Yes	16	70	27	6	43	

IV. ACKNOWLEDGEMENT

V. CONCLUSION

Undergraduate students have been going through severe psychological hardship during this ongoing COVID-19 pandemic. The future of the pandemic is uncertain and may have negative consequences on the academic and psychological aspects of undergraduate students in the long run. That is why it is important to address the impact of COVID-19 on the academic and psychological aspects of the students for the people concerned to schedule a long-term plan to control and reduce the issues.

REFERENCES

[1] Khan, A. H., Sultana, M. S., Hossain, S., Hasan, M. T., Ahmed, H. U., & Sikder, M. T. (2020). The impact of COVID-19 pandemic on mental health & wellbeing among home-quarantined Bangladeshi students: A cross-sectional pilot study.

[2] Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The Lancet.

[3] Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. Psychiatry research, 112934.

[4] Xiao, H., Zhang, Y., Kong, D., Li, S., & Yang, N. (2020). Social capital and sleep quality in individuals who self-isolated for 14 days during the coronavirus disease 2019 (COVID-19) outbreak in January 2020 in China. Medical science monitor: international medical journal of experimental and clinical research, 26, e923921-1.

[5] Dhar, B. K., Ayittey, F. K., & Sarkar, S. M. (2020). Impact of COVID-19 on Psychology among the University Students. Global Challenges, 4(11), 2000038.

[6] Owusu-Fordjour, C., Koomson, C. K., & Hanson, D. (2020). The impact of Covid-19 on learning-the perspective of the Ghanaian student. European Journal of Education Studies.

[7] Khanom, M., Hoque, A., Sharif, P. I., Sabuj, M. U., & Hossain, M. A. (2020). How were the Online Classes in Undergraduate Medical Teaching during COVID Pandemic? Students' Views of a Non-Government Medical College in Bangladesh. Bangladesh Journal of Medical Education, 11(2), 3-13.

[8] Dutta, S., & Smita, M. K. (2020). The impact of COVID-19 pandemic on tertiary education in Bangladesh: students' perspectives. Open Journal of Social Sciences, 8(09), 53.

[9] Chandasiri, O. (2020). The COVID-19: impact on education. Journal of Asian and African Social Science and Humanities, 6, 37-42.

[10] Aucejo, E. M., French, J., Araya, M. P. U., & Zafar, B. (2020). The impact of COVID-19 on student experiences and expectations: Evidence from a survey. Journal of public economics, 191, 104271.

[11] Emon, E. K. H., Alif, A. R., & Islam, M. S. (2020). Impact of COVID-19 on the Institutional Education System and its Associated Students in Bangladesh. Asian Journal of Education and Social Studies, 34-46.

[12] Shammi, M., Bodrud-Doza, M., Islam, A. R. M. T., & Rahman, M. M. (2020). Strategic assessment of COVID-19 pandemic in Bangladesh: comparative lockdown scenario analysis, public perception, and management for sustainability. Environment, Development and Sustainability, 1-44.

[13] Cushioning the educational fallout of Covid-19 in Bangladesh | The Daily Star. https://www.thedailystar.net/opinion/news/cushioning-the-educational-fallout-covid-19-bangladesh-1965789 (Accessed on 30 December 2020).

[14] Begum, F., Alam, S. Z. H. M. S., Alam, U. N. I. H., & Omar, L. N. (2020). Combating the impact of COVID-19 on Public University Students through Subsidized Online Class: Evidence from Bangladesh. indicators, 11(27).

[15] Mohamed A. A. Mahdy,(2020), The Impact of COVID-19 Pandemic on the Academic Performance of Veterinary Medical Students, Frontiers in Veterinary Science, ,Volume 7, Article 594261.

[16] Kecojevic, A., Basch, C. H., Sullivan, M., & Davi, N. K. (2020). The impact of the COVID-19 epidemic on mental health of undergraduate students in New Jersey, cross-sectional study. PloS one, 15(9), e0239696.

[17] Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. Journal of medical internet research, 22(9), e21279.

[18] Lovrić, R., Farčić, N., Mikšić, Š., & Včev, A. (2020). Studying During the COVID-19 Pandemic: A Qualitative Inductive Content Analysis of Nursing Students' Perceptions and Experiences. Education Sciences, 10(7), 188.

[19] Official website of Check Market, Belgium, available at https://www.checkmarket.com/ sample-size-calculator/, (accessed on 22 December 2020).

Md. Mortuza Ahmmed did his B.Sc. and M.Sc. in Statistics, Biostatistics and Informatics from University of Dhaka in 2007 and 2009 respectively. He is currently working as an Assistant Professor in Statistics under Department of Mathematics, American International University – Bangladesh. His research interests include demography, education, epidemiology etc. He has published several articles in local and international peer reviewed journals and conferences.

Dr. M. Mostafizur Rahman is basically a mathematician with extensive experience of mathematical modeling in multi-disciplinary environment. Dr. M. Mostafizur Rahman was born and brought up in Dhaka, Bangladesh. He completed his bachelor in mathematics and masters in applied mathematics from the University of Dhaka. He holds a PhD in information engineering from the University of Padova, Italy and worked as a post-doctoral research fellow for two years in the same University. He is serving as an Associate Professor in the department of Mathematics at American International University-Bangladesh.

Abhijit Bhowmik Completed his B.Sc. in Computer Science & Engineering in 2009 and M.Sc. in Computer Science in 2011 from the American International University– Bangladesh (AIUB). Currently he is pursuing his PHD degree from University Malaysia Pahang in NLP and Machine Learning. He is working as Associate Professor and Special Assistant, Office of Student Affairs (OSA) in the Department of Computer Science, AIUB. His research interests include NLP, Machine Learning, wireless sensor networks, video on demand, software engineering, mobile & multimedia communication, and data mining.

Ayesha Siddiqua is serving as an Assistant Professor in the department of Mathematics at American International University-Bangladesh since September 2010. She has completed her MPhil degree from BUET in 2018. Her research area is Fluid Dynamics. She completed her MS in applied Mathematics in 2007(Exam held in 2009) and BSc in Mathematics in 2006(Exam held in 2008) from University of Dhaka. At present she is a PhD student of Dept. of Mathematics, BUET. Her recent research interest is Biotechnology and Fluid Dynamics