Research article

Mental health of students amidst the COVID-19 pandemic: An empirical study

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ABSTRACT

Purpose: Considering the severity of the global outbreak of coronavirus (COVID-19) on the whole of humanity, particularly in this case on the physical and mental health of students, this study strives to explore the role of financial worries, employment anxiety and COVID-19 knowledge on depression and mental health among students in Bangladesh.

Design/methodology/approach: In the study, a deductive reasoning approach was employed, together with a self-administered questionnaire survey. Questionnaires were sent to the respondents via different social media and by email by creating a Google form link. We finally received 387 responses students aged over 18 years who had internet access in order to complete the survey. To analyze the data, structural equation modeling via AMOS was used.

Findings: The results showed that employment anxiety, financial worry, and knowledge on COVID-19 positively influence depression, and finally depression negatively influences the mental health of the students. Thus, our findings supported all of the proposed hypotheses.

Originality/value: The research enriches the existing literature pool by contributing empirical substantiation on the role of employment anxiety, financial worries and knowledge of COVID-19 in depression, and the impact of depression on mental health.

1. Introduction

Novel Corona virus (COVID-19) has permeated every corner of the globe and billions of people have been under strict lockdown following the outbreak of the virus outbreak in China in 2019 impacting financial, physical and mental health of people globally [1, 2, 3, 4]. Bangladesh confirmed its first infection cases on March 8, 2020, and the number of affected people has not stopped yet [5]. Vaccination, physical distancing, home quarantine, isolation, lockdown and prohibition of mass gatherings and celebrations are the only feasible measures to remain safe from the virus [6, 7]. Amidst the crisis, in order to ensure minimal interactions and further spread of the infectious disease, all schools and higher educational institutions in Bangladesh suspended their operations for an undetermined period [8, 9]. Apart from being infected, people are exposed to mental suffering, such as stress, insomnia, anxiety and depression due

to program delays, family income reduction, and depletion of employment opportunities [10, 11, 12].

In addition, future employment anxiety, financial worries related to reduced family income and mixed results on COVID-19-related knowledge during the pandemic play a significant role in causing depression in young adults, which ultimately affects their mental health [13, 14]. The review paper of Rajkumar [15] posited that several studies demonstrated that respondents showed different degrees of psychological reactions, such as anxiety and stress situation after this pandemic. Moreover, studies of Ren et al. [16] and Ren et al. [17] among adolescents and students documented numerous factors, such as sleep quality, physical activity, family economic status, school reopening, etc impacting mental health. Kawohl and Nordt [12] and Mojtahedi et al. [18] showed that the COVID pandemic caused incessant distress situation, caused by the increased job losses and unemployment rates globally. Economic and financial adequacy due to employment cut relates to depression and

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mental health amongst young people because fluctuations in adults' income impacts their expenditure on education and psychological health of the youth [10, 19].

Initially, social distancing [20], use of facemask [21], and lockdown or self-quarantine [22] were the only tools to contain the spread of the COVID-19, but the studies cited above showed that the existence of mental health could not be prevented entirely. On a positive note, current knowledge about the dos and don'ts during the outbreak may help people avoid contagion, but on the other hand, myths about COVID-19 propagated by increased media reporting and social media may misguide and mislead people [23, 24]. Therefore, insufficient knowledge about the virus can result in depression and detrimental effects on students' mental health [5]. Mental health issues remain unaddressed, even though they are as important as physical health [5, 25, 26].

This study investigates students' mental health status at diverse educational institutes in Bangladesh during the pandemic. It is the first work in the Bangladeshi context that assesses through a model the extent to which COVID-19 is affecting students' mental health. Additionally, it explores the mental state and symptoms of depression of Bangladeshi students at various academic institutions during the school closures since the first reported case in March 2020. Mental health issues are remaining unaddressed even though it is equally important as physical health. This study adds a new empirical evidence on the current state of students' depression and mental health from an emerging developing country, Bangladesh.

2. Theories and hypothesis development

2.1. Employment anxiety and depression

Employment anxiety refers to impulsion, ambiguous fears, insecurities and spiritual reactions to one or more components of a specific job, which create tension among individuals regarding their job security in the future [27, 28]. WHO [29] defines depression as a mood disorder that negatively affects one's feelings and thinking, characterized by a depressed mood, loss of interest or satisfaction, loss of energy, a sense of guilt or self-worth, disrupted sleep or taste, and less attentiveness [30].

The distressing effects of the pandemic have motivated scholars and psychiatrists from all over the world to focus on and explore the impact on psychological health and wellbeing caused by unemployment [31, 32, 33]. Global pandemic have always taken their toll on the employment sector by creating jobcuts and job insecurity. Like the previous global crisis, the COVID-19 pandemic has also introduced many restrictions on human life and the global economy [34]. These undue employment positions, precarious employment, and job losses create employment anxiety among job seekers [35]. Additionally, news on increasing job losses result in student depression and adversely affects their mental health [36].

The increasing negative information about employment and the financial crisis turn students into the most vulnerable group affected, since fresh graduates will face an uncertain job market with little or no investment in new businesses [37]. Moreover, a crisis brings difficulties in managing the basic survival needs of families, with the threat of unemployment and the cost of medical treatment proliferating rapidly [12, 38]. Several longitudinal studies have revealed a strong correlation between depression and unemployment, classifying depression as an outcome of unemployment [39]. Therefore, we hypothesize that:

H1. Employment anxiety is positively associated with depression.

2.2. Financial worries and depression

The adequacy and amount of economic solvency that protects individuals against monetary risks such as sudden unemployment, health hazards and poverty after retirement can be defined as financial wellbeing [40]. Financial worries refer to perceived future uncertainty or unpleasant feelings experienced by individuals who are unable to meet their financial needs [41]. A variety of factors, such as lack of funds, shrinking wages, debt, and job insecurity may lead to such worries. Pearlin et al. [42] conclude that the level of depression, self-confidence, and personal life management changes significantly with the advent of financial worry. The financial concerns and reduction in family incomes due to the COVID-19 pandemic have intensified students' depression because of inadequate support for education, health treatment and household expenditures [43]. Therefore, it is evident that increased financial stress, followed by a sudden decline in healthy life control, provokes depression [44]. Hence, we propose the following hypothesis:

H2. Financial worry is positively associated with depression.

2.3. Knowledge of COVID and depression

Knowledge is a blend of values, beliefs, information, and experience that provide a framework for evaluating and understanding the significance of any particular context [45]. A high degree of knowledge allows people to remain aware of the situation; however, the opposite might happen [46]. SARS, a severe respiratory illness that first came to light in 2003, led to the concept of infodemia, the spread of false information regarding a pandemic situation through various social, electronic and print media, which has been revived again during the outbreak of COVID-19 [47]. Being a novel virus, COVID-19 has affected most of the population psychologically, as people did not have access to accurate information during the initial stage. Because of the widespread dominance of infodemia, people of diverse ages, genders, religions, and professions have different perceptions regarding the symptoms of COVID-19 and only a negligible percentage of them possess correct knowledge [48]. As found by previous studies, accurate disease-related understanding and awareness influence positive behavior and guide people to strictly follow the preventive measures for containing the spread of disease [49]. However, the lack of accurate information, coupled with the increased strain caused by the circulation of widespread false thought-provoking news, eventually leads to psychological distress, particularly depression, among the mass population [50]. Hence, the following hypothesis is posited:

H3. Knowledge on COVID-19 outbreak is positively associated with depression.

2.4. Depression and mental health

Mental health refers to the wellness of the physical and psychological state of an individual, not just the non-existence of diseases or instability [13, 51]. Several studies have observed an association between depression and mental health [52, 53]. The study of Xiong et al. [4] reported that the depression emanated from chronic, employment anxiety, student status, and exposure to frequent COVID-19 news severely worsens the mental health status. A recent study of Wang et al. [3] on 4612 participants from participating 8 countries and three different continent showed that the physical symptom and the perceived need for health related information triggered depression symptom which resulted the negative effect on mental health. Likewise, the literature review paper of Ceban et al. [54] revealed that respondents with higher preexisting mood disorder were found at more hospitalization and death.

Moreover, due to COVID-19, the conventional ways of doing things have changed drastically, with social interaction being no exception [34]. Strategies such as physical distancing and quarantine have proved to be very useful in reducing the spread of the virus. Notably, strict governmental interventions rooting out the insecurities during pandemic might also be very effective tool to limit the psychological meltdown, such as suicide [35]. However, previous research suggests that people under strict quarantine for an extended period, separated and unable to interact with others, are exposed to severe mental health-related complications due to the gradual development of the symptoms of depression [55]. Kawachi and Berkman [56] and Ryan and Ryan [57] also agreed that preventing the social interaction
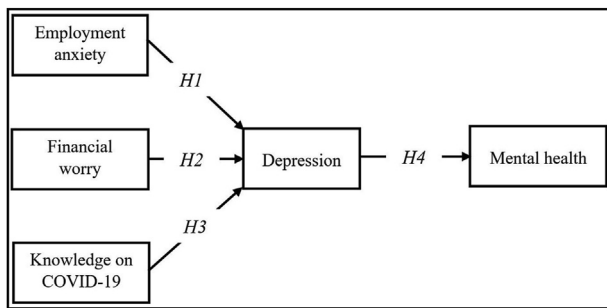
Figure 1. Research framework.

among people during a crisis eventually leads to reduced mental healthiness and increased depression. Moreover, stressors such as one's own physical health, family members' health or that of close ones, and economic or any sort of future uncertainty contribute to the emergence of fear, resulting in depression among people in the long run [58]. Notably, depression affects young adults more severely than older ones and is studied universally because of its diverse effects on mental health [59]. Finally, a recent study by Ahmed et al. [60] also found that depression caused by prolonged anxiety contributes to a heightened level of mental distress and low mental health. Hence, we predict that:

H4. Depression is negatively associated with mental health.

Considering the above empirical investigations and theoretical underpinning, we developed the following model, which is shown in Figure 1. The research model shows that employment anxiety, financial worries, and knowledge of COVID-19 have positive influences on depression, which in consequence negatively linked with mental health. Based on empirical evidence, the research model indicates a rational interrelationship between the dependent and independent variables.

Table 1. Demographic profile of the respondents (n = 387).

Variables	Classifications	Frequencies	Percentage
Age (Mean age is 22.7 years)	Less than 21	75	19.40
	Less than 25	206	53.20
	25 and above	106	27.40
Gender	Male	207	53.5
	Female	180	46.5
Education	Bachelor	273	70.5
	Master	93	24.00
	Others	21	5.4
University type	National	15	3.9
	Public	324	83.7
	Private	48	12.4
Current status	Student	340	87.8
	Self-employed	20	5.2
	Not-mention	27	7.0
Living area	Urban	222	57.4
	Sub-urban	68	17.5
	Rural	97	25.1
Religion	Islam	335	86.6
	Hinduism	40	10.3
	Others	12	3.1
Family income	Less than 15K	98	25.3
	Less than 35K	163	42.1
	Less than 60K	96	24.8
	More than 60K	30	7.8

3. Research method

3.1. Research design

The study pursued a quantitative method. A self-administered survey and deductive reasoning approach were employed to scrutinize the relationship among the variables. A multi-item scale was used to measure the perceptual value of the construct. The original questionnaire was developed in English, but to ensure accurate understanding of the questions and to help the respondents, a panel of bilingual experts was asked to translate the English version into Bengali following the back-translation method recommended by Brislin [61].

3.2. Data collection and sample characteristics

The study was conducted in Bangladesh using online platforms for the survey from March 01, 2021 to March 31, 2021. The questionnaire link was sent to 837 potential respondents by creating a Google form via different social media, such as facebook, linkedin and by email which was at par with the studies in China and Iran [62], Philippines [63] and Vietnam [22]. The targeted respondents were young adults pursuing education at different levels, aged between 18 to 26 years. The questionnaire was divided into two different parts. Part 1 included items reflecting the measurement of the latent variables and Part 2 comprised the demographic characteristics of the participants. We finally received 401 responses with a response rate of 47.91 percent, and 14 were rejected due to unmatched cases and incomplete data. Table 1 represents the demographic profiles of the respondents. Out of the 387, it can be seen that the majority were male (53.50%), ranging between 21 and 25 years old (53.20%). 87.38% of the respondents were students, and 83.70% of these from public universities, with 57.4% living in urban areas, 86.6% Muslim, and 42.1% with an income in the range of BDT 15000 to BDT 35000.

3.3. Measurement tools

The underlying measures were adopted from previous studies (see Appendix I), and necessary alterations were made to ensure the robustness of the scale for COVID-19 context. Each item representing the scale measured with 5-point Likert scale (1 = strongly disagree and 5 = strongly agree). We used scales from prior studies because those were established scale with the psychometric properties within the threshold limits. The scale to quantify employment anxiety was adopted from the work of Hagquist and Starrin [64], and comprised seven items. A three item instrument developed and validated by Hilton and Devall [65] was used to measure financial worries, while to measure knowledge of COVID-19, a six item scale was adopted from the studies of Sajed and Amgain [66]. A six item scale developed by Meijer, de Vries and van Bruggen [67] was used to measure the depression of the respondents. Finally, a five item scale devised by Heun et al. [68] was used to measure their mental wellbeing.

4. Compliance with ethical standards

We followed all procedures in accordance with the ethical standards from the ethical review committee [reference no: mbstu/b.ad/others/15/327/2020(3)] of the Department of Business Administration, Faculty of Business Studies, Mawlana Bhashani Science and Technology University, Bangladesh. The study was conducted in line with the 1964 Helsinki declaration and its other related amendments. Informed consent was received from the respondents before collecting the data, indicating that they were participating willingly and would be able to withdraw at anytime during the data collection period. The anonymity of the respondents and the confidentiality of their data were assured.

Table 2. Estimates on reliability and validities.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Control variables												
1. Age	1											
2. Gender	−.214**	1										
3. Education	.153**	.127*	1									
4. Current status	.166**	−.119*	.174**	1								
5. Residence	−.024	−.109*	.035	−.012	1							
6. Religion	−.034	.130*	.136**	.008	−.091	1						
7. Family income	.047	.193**	.009	.155**	−.227**	−.010	1					
Latent variables												
8. EA	−.042	−.011	−.018	−.038	−.048	.013	−.089	0.726				
9. MH	.033	−.076	.015	.013	.023	−.031	.018	−.261**	0.867			
10. DP	−.044	.085	.017	.028	−.043	.058	−.066	.281**	−.573**	0.850		
11. KC	−.048	.046	.076	.022	−.009	−.003	−.014	−0.012	−.084	.148**	0.761	
12. FW	.071	−.086	.019	−.023	−.024	−.011	−.195**	.395**	−.307**	.327**	0.002	0.816
CR	-	-	-	-	-	-	-	0.886	0.921	0.928	0.873	0.856
AVE	-	-	-	-	-	-	-	0.527	0.700	0.722	0.580	0.666
Mean	22.69	-	-	-	-	-	-	4.29	2.12	3.95	4.04	4.18
Std. Deviation	2.213	-	-	-	-	-	-	.492	.751	.738	.552	.684

**, *. Correlation is significant at the 0.05 and 0.01 level (2-tailed), respectively, EA. Employment anxiety, MH. Mental health, DP. Depression, KC. Knowledge on COVID-19, FW. Financial worry, CR. Composite reliability, AVE. Average variance extracted.

5. Analysis and findings

5.1. Descriptive analysis

Table 2 shows the detailed results of the underlying variables using standard deviation, mean, and other estimations. It confirms that the illustrations reveal no issue with latent variables. The correlation estimates show that only knowledge and awareness of COVID-19 is not significantly associated with employment anxiety, mental health and financial worries.

5.2. Measurement model with confirmatory factor analysis

The study used structural equation modeling (SEM) via AMOS to analyze the results. SEM is recommended by researchers to examine both the measurement and structural models holistically [69]. The psychometric properties of scales are represented via Table 2 and Figure 2. Figure 2 shows the confirmatory factor analysis with the item loadings, in which the mean score of a latent variable is more than the threshold limit (>0.700) [70]. Model fit estimates reveal a very good fit (CMIN/DF = 1.34, CFI = 0.984, SRMR = 0.041, TLI = 0.984, RMSEA = 0.03, PClose = 1.00) [70]. Regarding the convergent validity issue, Table 2 indicates that composite reliability and average variance extracted exceeded the minimum threshold limits of 0.70 and 0.50 [70] respectively. Table 2 also confirms that discriminant validity was realized, considering that the square root of the average variance extracted of a latent variable is larger than its correlation with other latent variables [70].

5.3. Hypothesis testing using the structural model

To examine the hypothesized relationships, we used a structural model along with its path coefficients and p-value. The path estimates, together with the path coefficients, standard errors, and decision statements are shown in Figure 3 and Table 3. The results in Table 3 show that employment anxiety positively influences depression significantly (β = 0.202, t-value = 3.783), which support the hypothesis 1 (H1). We then hypothesized that financial worries positively influence depression; the demonstrated results are also significant (β = 0.302, t-value = 5.513), meaning hypothesis 2 (H2) is also supported. Similarly, the hypothesis 3 (H3) (the influence of knowledge of COVID-19 on depression) was also found positive and significant (β = 0.164, t-value = 3.100) and statistically supported. Finally, in the hypothesis 4 (H4) the study proposed that depression adversely influence students' mental health. The findings are in line with the hypothesis and statistically significant (β = −0.614, t-value = −11.857), thus supporting hypothesis 4 (H4).

6. Discussion

Since its first appearance in China, COVID-19 has become an unavoidable source of psychological trauma all over the globe. Based on the findings of previous studies on mental health, it is evident that depression is closely associated with traumatic events [71]. Young people of all classes, in this case students, are greatly affected by the psychological trauma caused by the pandemic [60, 72]. This study aimed to clarify the impacts of the COVID-19 pandemic on students' psychological condition. Based on the lens of theoretical and empirical findings, the study developed four hypotheses and synthesized the findings.

Similar to previous findings, the first hypothesis (H1) (employment anxiety leads to depression) is statistically supported [73, 74]. The shrinkage in job opportunities and the sudden significant downsizing of jobs around the country have created fear and depression among students. Furthermore, students are the largest group suffering from the issue, such as academic delay and falling prey to depressive symptoms at this stage may cause longterm psychological distress [75].

The prediction about financial worries influencing depression in H2 is statistically supported and found to be consistent with previous studies
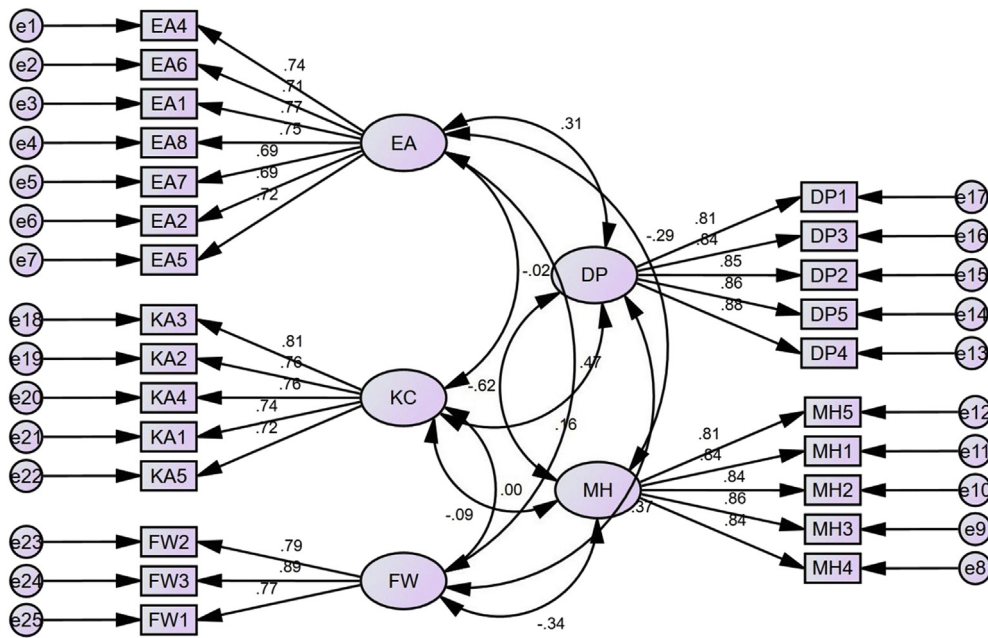
Figure 2. Confirmatory factor analysis.

[41, 44, 76]. Financial worries, which have become prevalent during the pandemic, can ultimately lead to depressive behavior. Students and job-seekers with no part-time jobs are more prone to this issue due to the fear in them regarding the present job crisis and future employment uncertainty. During the pandemic, family hurdles and financial stress may lead to avoidable behaviors, worsening mental health conditions, and changed lifestyle at an alarming rate [77, 78]. At present, those who are not able to meet basic needs because of financial setbacks may show severe symptoms of mental pressure and depression.

The hypothesis on the influence of knowledge of COVID-19 on depression (H3) was also found to be significant and supported by the prior studies [48, 79]. The results demonstrate that individuals with a high degree of knowledge about COVID-19 try to adhere to the strict

precautions, such as social distancing, self-quarantine, etc., increasing their loneliness and depression [80]. In contrast, people with the less access to appropriate knowledge are unaware of the devastating situation, making them less concerned and depressed.

Finally, we focused on establishing the impacts of depression on mental health. Consistent with the fourth hypothesis (H4), it was found that depression negatively affects mental health, which means that a high level of depression weakens it [59, 81]. During the COVID-19 pandemic, students have faced a most challenging and tough situation, fuelled by continuous isolation, news on the increasing death toll and infection, employment uncertainty, financial worries, inadequate knowledge, etc. These factors affect mental wellbeing by giving rise to panic attacks, insomnia and additional psychological tension.
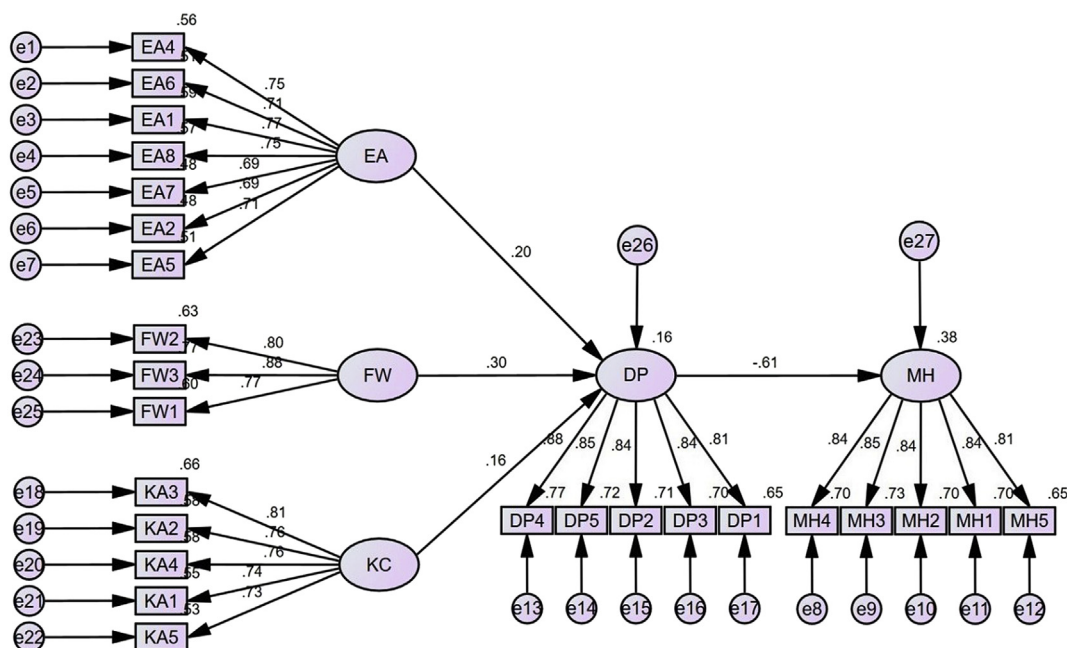

Figure 3. Structural equation model.

Table 3. Estimates on proposed hypotheses.

Hypothesis	Path relations	Standardized β	Standard error	Critical ratios	p.value	Decision
H1	EA→DP	0.202	0.079	3.783	***	Supported
H2	FW→DP	0.302	0.064	5.513	***	Supported
H3	KC→DP	0.164	0.072	3.100	0.002	Supported
H4	DP→MH	−0.614	0.048	−11.857	***	Supported

6.1. Theoretical contribution

The study, being the only one of its kind in Bangladesh, has brought a new level of knowledge to the literature. A new model has been proposed to demonstrate how factors such as employment anxiety, knowledge of COVID-19, financial worries, and depression may have a substantial effect on individuals' overall mental health, particularly students. The model extends current knowledge about depression affecting the psychological wellness of students from a developing country perspective. The findings provide an in-depth analysis of the group which is the most prone to experience degraded mental health conditions due to the COVID-19 outbreak. The study also enriches the literature by analyzing depression from multiple perspectives, which adds new evidence to the composition of mental health. Apart from employment anxiety and knowledge of COVID-19, this study has also investigated how reduced family income and future financial uncertainty can lead to depression. Therefore, the study acts as a supporting tool for policymakers in both the country's education and development sectors, providing the relevant authorities with appropriate steps for overcoming the mental health issues of students during the COVID-19 pandemic.

6.2. Policy implications

The paper adds new insights for policymakers to improve the approaches they take. Relevant bodies can take the initiative in student development programs to prepare students for the future job market, that may require multidimensional skills. These programs have two-fold benefits. First, students can take advantage of the quarantine period to increase their marketability and employability skills by improving their potentiality. Second, becoming acquainted with new skills will boost students' confidence and help reduce future employment anxiety. Furthermore, policymakers should pay attention to promote students' mental wellness interventions, such as frequent practice of health hygiene, wearing face masks, collective measures to avoid large gathering, reduce the excessive use of air-conditioning, further spreading of COVID-19 facts, and ensuring interpersonal distance [82]. Different counseling programs and webinars can be launched to keep students motivated and engaged during the pandemic. The use of internet cognitive behavior therapy (CBT) is one of the prevalent treatments to contain and limit the psychological impact during any health emergency [83, 84]. Ho, Chee and Ho [85] and Zhang and Ho [86] emphasized on using CBT during COVID-19 to improve mental wellbeing because this open sourced program is easy to deploy without requiring much technical knowledge. Additionally, the relevant authorities should take measures to control the spread of misleading information via social media platforms. It can be attested that preventing infection without adequate knowledge, followed by strict adherence to preventive measures, is paradoxical in this situation. Therefore, the dissemination of reliable information about the virus should be filtered regularly from now on [87]. Finally, concerned policymakers and educators must think of building mental toughness among students because it works as a psychological resource promoting mental health and prevents distressful situation, such as depression, anxiety, and stress [88]. Arranging and promoting mental toughness through action programs will turn the individuals resilient and reduce their COVID-19 panic and its associated depression symptom and stressful situation [18].

6.3. Limitations and future research directions

Although the study provides many useful insights and interventions for policymakers and regulatory bodies, it has some drawbacks that need to be acknowledged. First, we excluded respondents with no internet and social media access, which was found consistent in similar other studies in developing countries [22, 62, 63]. Future studies should incorporate both offline and online platforms to strengthen the research and collect data from diverse sources. Second, the cross-sectional data alongside the small sample size was another drawback limiting the drawing of causal inference from the findings [89]. Thus, we recommend the use of large sample size along with the longitudinal data for increasing the generalizability of the findings. Third, the study only focused on the proposed model to observe the effects of certain variables on students' psychological wellbeing. However, to obtain a complete picture of this issue, more research including other possible factors that affect mental health conditions is encouraged. Fourth, the pandemic will undoubtedly leave a mark on people's mental health condition irrespective of their age, employment, educational qualifications, or earning level. This study focused solely on students, which opens the avenue for further research and extensive exploration considering other population groups. Finally, the present study enclosed the model with the knowledge on COVID-19 impacting the depression symptom in where the vaccination information was not considered. Study of Hao et al. [90] showed that the acceptance of COVID-19 vaccines significantly improved mental health. Thus, the present study suggested to further examine the influence of knowledge on COVID-19 on depression through a multi-group analysis between vaccinated and non-vaccinated groups.

7. Conclusion

Our study provides unique insights into depression and the mental health issues of students, which have been rarely addressed previously. The results show that employment anxiety, financial worries and lack of knowledge of COVID lead to depression, which has a negative spiral effect on students' mental health. Subsequently, the research findings reveal the importance of implementing different coping strategies that will take care of students' mental health and keep them positive throughout the crisis. Eventually, the pandemic will go, but may leave behind a large number of people vulnerable to a more severe threat of being infected. Therefore, feasible steps are required to allow people to accept and adopt to the 'new normal' way of life with ease.

Declarations

Author contribution statement

Md. Ashraful Alam: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Ahmed Ishmum Uddin, Salma Begum, Habibun Nahar: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Md. Aftab Uddin: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data.

Tarik Raihan: Conceived and designed the experiments; Performed the experiments; Wrote the paper.

Abdul Gaffar Khan: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data.

Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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