

Article

Impact of Social Media on Knowledge of the COVID-19 Pandemic on Bangladeshi University Students

Shanjida Chowdhury ¹, Mahfujur Rahman ² , Indrajit Ajit Doddanavar ³ , Nurul Mohammad Zayed ⁴ , Vitalii Nitsenko ^{5,6,*} , Olena Melnykovich ⁷ and Oksana Holik ⁷

¹ Southeast Business School, Southeast University, Dhaka 1208, Bangladesh

² Department of Statistics, Cumilla University, Cumilla 3506, Bangladesh

³ Jain College of MCA & MBA, Belagavi, Affiliated to Rani Channamma University, Belgaum 590014, Karnataka, India

⁴ Department of Business Administration, Daffodil International University, Dhaka 1216, Bangladesh

⁵ Department of Entrepreneurship and Marketing, Institute of Economics and Management, Ivano-Frankivsk National Technical Oil and Gas University, 76019 Ivano-Frankivsk, Ukraine

⁶ SCIRE Foundation, 00867 Warsaw, Poland

⁷ Department of Advertising and Journalism, State University of Trade and Economics, 02156 Kyiv, Ukraine

* Correspondence: vitaliinitenko@onu.edu.ua; Tel.: +380-939983073

Abstract: This study aimed to examine the role and impact of social media on the knowledge of the COVID-19 pandemic in Bangladesh through disseminating actual changes in health safety, trust and belief of social media's coverage statistics, isolation, and psychological numbness among students. This study used a cross-sectional design in which a quantitative approach was adopted. Data from an online survey were collected in a short period of time during the early stages of COVID-19 to determine the relationship between social media activity and knowledge of the COVID-19 pandemic with accuracy. A total of 189 respondents were interviewed using structured questionnaires during the onset of the COVID-19 outbreak in Bangladeshi university students. Exploratory factor analysis (EFA) and path analysis were performed. Out of 189 respondents, about 80% were aged between 16 and 25 years, of which nearly 60.33% were students. This study explored four factors—knowledge and health safety, trust in social media news, social distancing or quarantine, and psychological effect—using factor analysis. These four factors are also found to be positively associated in path analysis. Validation of the model was assessed, revealing that the path diagram with four latent exogenous variables fit well. Each factor coefficient was treated as a factor loading ($\beta = 0.564$ to 0.973). The results suggested that the measurement models using four elements were appropriate. The coefficient of determination was 0.98, indicating that the model provided an adequate explanation. Social media is transforming the dynamics of health issues, providing information and warnings about the adverse effects of COVID-19, having a positive impact on lockdown or quarantine, and promoting psychological wellness. This comprehensive study suggested that social media plays a positive role in enhancing knowledge about COVID-19 and other pandemic circumstances.

Keywords: social media; COVID-19; psychological impact; social distancing; knowledge



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1. Introduction

The coronavirus (COVID-19) pandemic is running rampant globally, creating a worldwide health crisis. It has already significantly impacted the everyday lives of people. This deadly virus has killed many millions, among which older adults have been the main victims. A novel strain of coronavirus, SARS-CoV-2, was first identified in December 2019 in Wuhan, a city in China's Hubei province, after a flare-up of pneumonia without apparent reason. Globally, there were 54,558,120 confirmed cases of COVID-19, including 1,320,148 deaths according to the latest update by the World Health Organization (WHO) on 17 November 2020, which declared a pandemic on 11 March 2020 [1,2]. Most countries

have tried to save people's lives from the pandemic threat by putting in place various restrictive measures including lockdowns and social distancing. The economy in many countries has come tumbling down due to the COVID-19 [3]. The whole world has come to a standstill, focusing its efforts on resisting this disease. If adequate precautions are not implemented, developing countries with frail healthcare systems may suffer the most disastrous consequences from this epidemic [4,5]. This pandemic has become a serious socioeconomic, behavioral, psychosocial, governance, and technology challenge, particularly for the frontline healthcare sector. This health crisis has already been transformed into a global economic crisis [5].

Bangladesh declared a war against COVID-19, like many other countries, becoming one of the worst-affected nations by this havoc [6,7]. In many parts of the nation, formal measures such as closing schools, closing offices for a 1 month trial period, prohibiting people from leaving their homes after 6 p.m., taking legal action against those who do, banning gatherings in mosques, and restricting public gatherings were swiftly implemented. This nation has faced a number of challenges as a result of the pandemic, including maintaining social distancing, inadequate COVID-19 testing facilities, a lack of COVID-19 mitigation strategies, and limited financial support [8–10]. To battle the outbreak, Bangladesh was compelled to proclaim a state of emergency commencing 26 March 2020 [8,11,12]. The elected government then imposed social distancing, isolation, and home quarantine measures to reduce infection rates [13]. However, the lives of all individuals have been affected by COVID-19 from the social, professional, and personal aspects. A national lockdown strategy was implemented as a remedy, as in other countries [14]. This strategy significantly affected agricultural production, food supply, and demand. People in Bangladesh came to know about the infectious virus through television, radio, newspaper, social media, or personal experience, stimulating anxiety and agitation among citizens, as well as their friends and family. Social media has recently emerged as indispensable to reach people easily. Defining social media is a difficult task because it is a constantly changing field. According to Joosten [15], the term “social media” refers to any number of technological systems that are linked to cooperation and community. Again, Saydan and Dulek [16] defined social media as “social platforms where users share their information, manners, and interests via the internet or mobile systems” and big data applications as “social platforms where users share their information, manners, and interests via the internet or mobile systems” [17,18]. Today, social media plays an important role in shaping society and is perhaps one of the easiest ways to broadcast news or share an idea. During the COVID-19 pandemic, social media also educated people on how to prevent infectious disease and save lives. There were more than three billion active social media users before the outbreak of COVID-19. Since started the disease, a substantial rise in time spent on social media was observed, which facilitated the sharing of COVID-19 information. Online social media platforms such as Facebook, Instagram, and Twitter allow individuals to associate with one another across the globe, including the sharing of COVID-19 articles, papers, and reports. The young generation predominantly embraced web-based life during the pandemic. In addition to gathering COVID-19-related knowledge, previous studies [9,19] concluded that students obtained academic knowledge through the use of a variety of social media apps such as YouTube for self-learning, WhatsApp for exchanging papers, information, and presentations, and Zoom, Skype, and Google Meet for video conferencing to speed up learning. In addition to text messaging, video conferencing solutions have been widely used to promote communication between instructors and students. Students are becoming more assured in their capacity to use technology to learn, access, share, and generate relevant information, as well as gain knowledge about a subject. Social media has, therefore, been essential for spreading information throughout the pandemic. Despite the benefits of social media, a challenge during the pandemic has been the rapid spread of misinformation or fake news related to the virus outbreak [20,21]. People spent an average of more than 2 h a day on social media for news mainly related to COVID-19 [22,23], resulting in increased panic triggered by misinformation [22].

During the pandemic, direct dissemination of critical COVID-19 guidance through government offices became impossible [24]. Social media platforms, particularly Facebook and YouTube, as well as television and various websites, all played important roles in disseminating health messages and keeping people up to date on the pandemic [20,25]. Social media platforms provide direct access to an unprecedented amount of content and may amplify rumors and questionable information. Twitter is playing an increasingly important role in the dissemination of health information. There is mounting evidence that a highly mentioned paper on this social media platform may reflect the quality of the paper, which may then be subject to debate in journal clubs, as well as a post-publication social peer review process that may aid in retraction [20,26]. Information shared on social media, such as general health precautionary measures, mask use, maintaining social distancing, hand washing, and lockdowns, has had a positive impact during the pandemic [1,27]. Governments and public health authorities use social networking sites to inform citizens about COVID-19 testing locations and more affected areas, strictly taking responsibility for posting legitimate information related to COVID-19. By identifying and tracking user behavioral patterns, social media can transfer useful information about infectious diseases. Pandemic-related social media health campaigns can be effective in slowing disease spread by conveying positive attitudes.

This study contributes to investigating the effect of social media use on the knowledge of the COVID-19 outbreak in Bangladesh among university students. Furthermore, this study considers educational level as an indicator with a distinct influence on all the variables (predictors and dependent) investigated. This approach was infrequent in previous research [28–30]. Structural equation modeling (SEM) has also been rarely used in studies on the COVID-19 pandemic in Bangladesh. To the best of our knowledge, this is the first study to empirically establish the assumed effect of social media on the knowledge of COVID-19 in the context of Bangladesh using exploratory factor analysis (EFA).

The physical threat of virus spread also requires social distancing by refraining from regular activity. China's strict actions, including institutionalized quarantine, isolation, dedicated hospitals, and social distancing, were highly effective. Social media has a powerful role in influencing behavior. According to Radwan and Radwan [31], social media can have a positive impact on the public if used correctly. Therefore, this paper aims to identify the impact of social media on the individual, social, and societal levels during the pandemic. The remainder of the paper is organized as follows: Section 2 describes the methods, along with the basic statistics and final findings of the article; Section 3 discusses the results of path coefficients and exploratory factor analysis (EFA); Section 4 provides a discussion; lastly, Section 5 presents the concluding remarks.

2. Materials and Methods

2.1. The Data

This study obtained primary data by conducting a survey. A structured questionnaire was developed to collect data on the impact and role of social media during the pandemic. The questionnaire was propagated as a self-administered Google Form [32] to the target respondents. A total of 189 responses were recorded, with a response rate of 18%, which is acceptable for an online survey. This survey was conducted from 21 March to 15 April 2020. Criteria for collecting data were being a regular or frequent internet (or Facebook, WhatsApp, Twitter, YouTube, Instagram etc.) user, with an age >15.

2.2. Methods

Categorical data analysis mainly involves statistical tools such as logistic, ordinal, or multinomial regression; logit or probit models including the structural equation model are considered superior. This complex and widespread model is used massively in marketing [33,34], psychology [35,36], and education [37,38]. In the case of the perception of social media use, SEM can amalgamate many tools such as factor analysis, path diagrams, latent growth models, and MIMIC. In this study, our goal was to explore latent information from

respondents related to social media's role in the COVID-19 pandemic. Each variable was recorded on a Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). For the path diagram, we examined the measurement model through exploratory factor analysis, allowing us to classify various variables into a limited number of selected factors. Structural equation modeling (SEM) has several benefits compared to other statistical analyses [39]. Firstly, SEM implies a hypothesis-testing approach for data, which enables scholars to build hypothesis-based methods. Secondly, SEM solves measurement errors by obtaining unbiased estimates of the relationship between variables. This error is removed upon correcting correlation or regression estimates. Thirdly, SEM assembles both latent and observed variables. Lastly, it provides the direct effect, indirect effect, and total effect of multivariate relations.

In this study, SEM was combined with statistical techniques to exhibit a latent relationship between dependent and independent or observed and unobserved variables [40]. Exploratory factor analysis (EFA) was used to display latent relationships among factors or latent variables. Path analysis models were used to perceive observed variables. This enabled us to estimate and exhibit the relationship between observed variables. The models also represent an essential part of the historical development of SEM, and they employ the same underlying process of model testing and fitting as other SEM models. The relationship of indicators was determined with latent variables through EFA in the measurement model. This study scrutinized four factors with 11 variables. Therefore, exploratory factor analysis (EFA), was examined using four factors: knowledge and safeguarding health through media, self-detainment at home, social media's accuracy, and psychological monotony.

3. Results

For this study, data were collected from 189 respondents, involving university students from different private and public universities. Data were collected through a self-administered questionnaire within a limited time. The background characteristics of the respondents are shown in Table 1. Among the respondents, about 64% were male; most of the respondents (80%) were from the age group 16–25 years old, whereas about 6.7% were more than 36 years old. Approximately 54.4% of respondents were from the megacity, whereas more than one-fourth were from a rural area.

Table 1. Background characteristics of the respondents.

Variables	Category and Measurement	N	%
Sex	Male = 1	115	63.9
	Female = 2	65	36.1
Age group	16–25 = 1	144	80.0
	26–35 = 2	24	13.3
	>36 = 3	12	6.7
Residence	Mega city = 1	98	54.4
	Urban = 2	35	19.5
	Rural = 3	47	26.1

In univariate statistics, each variable under an item also exhibits a correlation. Each variable's mean response was greater than or equal to four (Table 2), indicating that the respondents were optimistic about being queried. The standard deviation was less than one, indicating that discrepancy was not observed in response to any question. Additionally, this study found an intercorrelation of the items ranging from 0.6 to 0.8, indicating the acceptability of the items.

Table 2. Mean score and correlation of social media use during COVID-19 pandemic.

Variable	Mean	SD	Item-Test Correlation
Teaches about symptoms of coronavirus (COVID-19)	4.44	0.70	0.714
Teaches about the spread of coronavirus (COVID-19)	4.35	0.77	0.702
Teaches precautionary steps to reduce the chances of getting infected	4.33	0.73	0.769
Teaches categories of risk related to coronavirus (COVID-19)	4.21	0.82	0.736
Teaches about being properly sanitized	4.24	0.73	0.720
Teaches about the minimum safe distance between two persons being 1 m (3 ft)	4.22	0.85	0.701
Teaches the difference between isolation and home quarantine	4.01	0.97	0.669
Fake news/information related to coronavirus is spreading	4.21	1.00	0.369
There has been a negative effect on mental health during the outbreak of COVID-19	3.97	1.11	0.503
Helps to create public awareness of health issues	4.30	0.73	0.642
Helps to maintain social distance from others	4.14	0.87	0.627
Highlights actual figures related to death or infection during the pandemic	3.56	1.25	0.593
Highlights COVID-19 without any biases as it is a global issue	3.95	1.13	0.613
Effectively broadcasts government initiatives to fight against COVID-19	4.03	0.91	0.712
Keeps one entertained during the home quarantine/lockdown period	4.17	0.97	0.506
Effectively presents the benefits of the “stay home and stay safe” slogan	4.21	0.91	0.663

Before conducting factor analysis, some precautionary steps were taken to perceive general knowledge about the dataset. This study accumulated 189 respondents to explore the impact of social media on the COVID-19 pandemic. For observing outliers and reducing unobserved variables, Cronbach’s alpha was found to be 0.85. For sampling adequacy, the KMO measure and Bartlett tests (Table 3) both suggested that the sample size and correlation of items were acceptable, enabling further analysis.

Table 3. KMO and Bartlett’s test.

Kaiser–Meyer–Olkin Measure of Sampling Adequacy	Bartlett’s Test of Sphericity		
	Approx. Chi-Square	Degree of Freedom	<i>p</i> -Value
0.805	1016.23	55	0.001

For a more in-depth factor analysis, principal component analysis was employed in this study. According to the rules of thumb and Horst’s parallel analysis, this study accepted four factors that explained 78.23% of the variance (Table 4).

Table 4. Factor loading explained through Factor analysis.

Component	Total Eigenvalue	% of Variance	Cumulative %
1	4.751	43.188	43.188
2	1.475	13.408	56.595
3	1.248	11.348	67.943
4	1.132	10.289	78.232

On rotated factor loadings, Kaiser normalization was applied due to its simplicity and preferable performance. Under factor loadings, the first factor comprised five variables associated with knowledge-related issues (knowledge of symptoms, spread of knowledge, precautionary steps for protection, knowledge of risk criteria, and sanitization) (Table 5). The second factor comprised two variables (the accuracy of social media facts and figures, and biases in news broadcasting). The third factor incorporated two variables (home quarantine and lockdown issues). The fourth and fifth factors comprised two variables (fake information issues and psychological effect of lockdown). For subsequent estimation, the researchers further analyzed the normality of residuals, anti-image correlation and covariance matrices, and scree plot (Figure 1). In the scree plot, factors with eigenvalues >1 were counted. Furthermore, this study used parallel analysis to more effectively validate the factor analysis.

Table 5. Rotated component matrix under factor analysis.

Variables	Component			
	1	2	3	4
Teaches about symptoms of coronavirus (COVID-19)	0.82			
Teaches about the spread of coronavirus (COVID-19)	0.847			
Teaches precautionary steps to reduce the chances of getting infected	0.868			
Teaches categories of risk related to coronavirus (COVID-19)	0.833			
Teaches about being properly sanitized.	0.774			
Highlights actual figures related to death or infection during the pandemic		0.889		
Highlights COVID-19 without any biases as it is a global issue		0.864		
Keeps one entertained during the home quarantine/lockdown period			0.903	
Effectively presents the benefits of the “stay home and stay safe” slogan			0.814	
Fake news/information related to coronavirus is spreading				0.875
There has been a negative effect on mental health during the outbreak of COVID-19				0.849

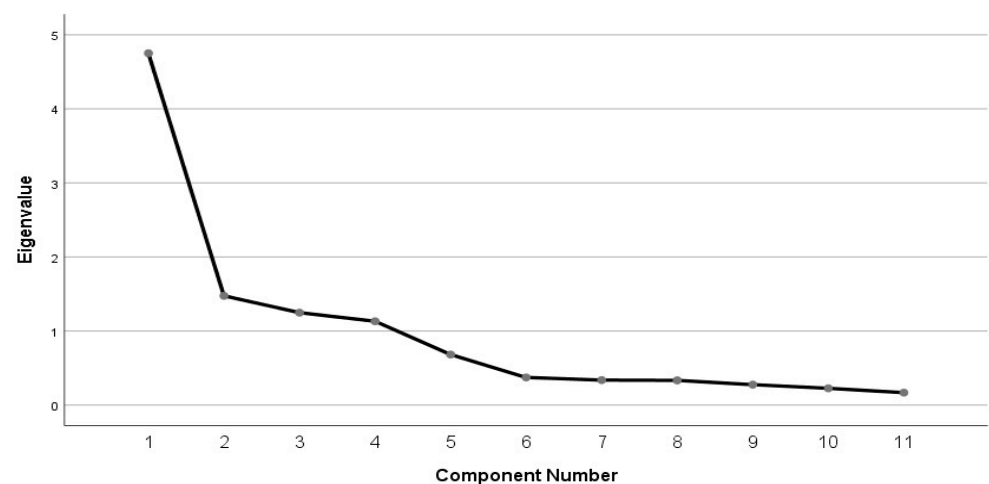


Figure 1. Scree plot after factor analysis.

Exploratory Factor Analysis (EFA)

Factor analysis identified four factors—(i) knowledge and health safety, (ii) trust in social media news, (iii) distance maintenance or quarantine, and (iv) psychological effect. The study conducted a path analysis using the latent relationships among the four factors, and the model was assessed according to its goodness of fit. As no previous studies analyzed the effect of social media on education, this study innovatively employed exploratory analysis by scrutinizing three factors and then establishing a structural equation model (SEM). Moreover, various cutoff points were examined using particular software.

For determining parameters, maximum-likelihood estimation was used as it is better than other traditional techniques and its estimates are unbiased, consistent, and efficient. A positive path coefficient between factors (standardized and unstandardized estimates) indicates their positive influence on each other through social media (Table 6). Therefore, social media plays a key role in enhancing knowledge, which ultimately helps to improve health and safety issues, as well as increase trust in social media news, quarantine maintenance, and psychological impact. In other words, social media can be used as a positive trigger for maintaining lockdown and raising the awareness of safety issues. Furthermore, trusting figures and abiding by lockdowns were treated as factor loadings ($\beta = 0.564$ to 0.973). This suggested that the measurement models of four factors fitted well. A squared factor loading shows the proportion of variance in the observed variable that is explained by the factor. A value of rotated loadings closer to 1 better explains the path coefficient from one variable to another. In other words, the measurement error is reduced. In Table 6, under the first factor (f1) related to knowledge of health and safety in acknowledging symptoms, the squared factor loading of knowledge about COVID-19 spread explained 86% of the variance for that variable under the first factor, with the remaining 14% representing the measurement error. Similarly, under f4 (psychological monotony), the squared loading of the negative effect on mental health during the outbreak of COVID-19 explained 97.3% of the variance. Each coefficient was positively and significantly associated at a 1% level of significance.

Table 6. Path coefficients of structural equation model.

Parameter	Items	B	p-Value
F1 (knowledge and safeguarding health through media)	Teaches about symptoms of coronavirus (COVID-19)	0.818 ***	0.001
	Teaches about spread of coronavirus (COVID-19)	0.854 ***	0.001
	Teaches precautionary steps to reduce the chances of getting infected	0.885 ***	0.001
	Teaches categories of risk related to coronavirus (COVID-19)	0.792 ***	0.001
	Teaches about being properly sanitized.	0.735 ***	0.001
F2 (social media's accuracy)	Highlights the actual figures related to death or infection during the pandemic	0.809 ***	0.001
	Highlights COVID-19 without any biases as it is a global issue	0.818 ***	0.001
F3 (self-detainment at home)	Keeps one entertained during the home quarantine/lockdown period	0.656 ***	0.001
	Effectively presents the benefits of the “stay home and stay safe” slogan	0.972 ***	0.001
F4 (psychological monotony)	Fake news/information related to coronavirus is spreading	0.564 ***	0.001
	There has been a negative effect on mental health during the outbreak of COVID-19	0.973 ***	0.002

*** The 1% level of significance for β -coefficient.

As another path diagram in tabulated form, we demonstrate the direct relationships between variables, as well as the total effect of each diagram. As each coefficient was positive, the overall path diagram indicated a positive relationship with statistical significance. In Table 7, the coefficients of the last two factors were >1 . Hence, psychological monotony and lockdowns had a greater effect according to the responses to “keeps one entertained during the home quarantine/lockdown period” and “fake news/information related to coronavirus is spreading”. Hence, our path diagram linking factors was statistically significant in terms of the total effect, model measurement, model fitness, and overall estimation.

Table 7. Total effect on factors of explanatory variables.

Paths	Coefficients	SE	<i>p</i> -Value
Teaches about symptoms of coronavirus (COVID-19) > f1	1	(constrained)	
Teaches about the spread of coronavirus (COVID-19) > f1	1.148	0.082	<0.001
Teaches precautionary steps to reduce the chances of getting infected > f1	1.126	0.082	<0.001
Teaches categories of risk related to coronavirus (COVID-19) > f1	1.134	0.094	<0.001
Teaches about being proper sanitized > f1	0.933	0.088	<0.001
Fake news/information related to coronavirus is spreading > f2	1	(constrained)	
There has been a negative effect on mental health during the outbreak of COVID-19 > f2	0.917	0.144	<0.001
Highlights the actual figures related to death or infection during pandemic > f3	1	(constrained)	
Highlights COVID-19 without any biases as it is a global issue > f3	1.390	0.144	<0.001
Keeps one entertained during the home quarantine/lockdown period > f4	1	(constrained)	
Effectively presents the benefits of the “stay home and stay safe” slogan > f4	1.920	0.238	<0.001

The chi-square ($df = 38$) ratio was 121.3, with a *p*-value of 0.19. This suggests that our hypothesized model fit the sample data well, and the null hypothesis of the model vs. saturated model was accepted [41,42]. In this model, the root-mean-square error of approximation (RMSEA) was 0.042 (<0.080); thus, the model adequacy was acceptable [37,41].

Additionally, the computed CLOSE (0.602) was significantly higher than 0.050, indicating no evidence to reject the fact that the RMSEA was greater than 0.500. Furthermore, the comparative fit index (CFI) and Tucker–Lewis index (TLI) [39,41,43] were 0.95 and 0.96, respectively. The coefficient of determination was also close to 1 (0.98). These measures all suggested that the model had a good fit. Subsequently, the skewness and kurtosis for normality, residuals, and basic statistics of variables were estimated [43]. There were no outliers, and each variable obeyed a normal distribution with an asymmetric shape according to skewness and kurtosis.

4. Discussion

This study aimed to evaluate the effects of social media on knowledge and safety issues, the accuracy of figures, isolation, and psychological monotony through exploratory factor analysis (EFA), in contrast to other theories such as knowledge, attitudes, and practices (KAP) [23,37,44–46] or other equation-based models [47–50]. Spreading information has a significant impact on people’s behavior and can change how well government countermeasures work. Despite lockdown being the only active preventive measure against

COVID-19, it was impossible to reduce labor in several areas of Bangladesh [10,12,49]. This study elucidated the positive and negative effects of social media on knowledge of COVID-19 among university students. Dependency on social media and knowledge on health safety represented the first factor explaining awareness of COVID-19 symptoms, spread, and transmission, as well as sanitization. These items revealed that social media played a significant role in preparing mankind for COVID-19, in line with similar research [24,50–53].

Accordingly, models that predict viral propagation are beginning to take into consideration the population's behavioral reaction to public health measures and the communication dynamics underlying content consumption [5,6,20,49,53]. Experts and beginners alike use social media to share their sensible and irrational viewpoints with little moderation. Self-detainment or isolation was the solution to fight this pandemic, and social media presented us with several miniature movies or animations. To reduce depression, anxiety, or stress, social media can play a positive role through entertainment [30,54]. Moreover, a recent study discovered that internet-based smartphone use can improve the perceived quality of life through facilitating positive social media connections, online shopping, online conferencing, and constant interaction with friends and family living in different countries [13].

Social media has been a blessing in this tough time for millions. It has been an excellent platform to enhance interaction and study collaboratively. Teachers can now create interactive lectures, graphical contents, and motion pictures, as well as use diversified digital tools to enable students to grasp lessons swiftly. The media has also been active in transmitting the latest news, highlighting the unfavorable attitude of many Bangladeshis. Long-term lockdowns, as well as unfavorable news or information, may impact mental health. An earlier study looked at the impact of lockdowns on mental health during the severe acute respiratory syndrome (SARS) outbreak [55–60].

Facebook, Twitter, YouTube, WhatsApp, and similar social sites assist students in getting updated information on national and international issues. Education is no longer confined to textbooks. Even before the pandemic, schools and colleges assigned tasks or set question papers according to the curriculum, thus limiting a student's learning. With access to social media platforms through online learning, students have the opportunity to search several sources for well-researched solutions. Teachers are no longer confined to the traditional teaching system. They provide students with educational video links, access to important resources, and assignment-based tasks to evaluate their understanding. Students are forced to sit exams, while question patterns are designed to require interaction and cooperation among friends. Social media platforms such as Messenger and WhatsApp enable learners get instant information, reviews, or solutions to their problems or get in touch with professors.

Facebook has played a vital role during this crisis. Several educational groups have been created to understand students' problems and provide them with proper guidance. Ed-tech platforms in Bangladesh use these social media platforms to offer courses at an affordable cost. In addition, these ed-tech organizations are coming up with more interactive video lessons to make learning enjoyable, while providing educational content. The COVID-19 pandemic has led to the birth of many ed-tech companies, changing the traditional educational system in Bangladesh at an unprecedented pace [8,19,49].

Students from remote areas craving quality education can browse YouTube to connect with the best teachers. Watching YouTube videos can motivate students to learn more, share information, or increase their attention span. It has become much easier to read the desired books, access online notes, or arrange video calls with teachers.

Not many students are connected to Twitter, but those who have signed up can gain global knowledge. This platform is paving the way in building connections and providing an opportunity to stand up for oneself. Disseminating views is a great way to build confidence at a younger age. With students facing less academic pressure, they are taking their creativity to a whole new level. Moreover, by sharing their work on various social media platforms, students are getting a break from their daily study routine.

This study tried to examine alternative ways of indicating social media's effect on knowledge about the COVID-19 pandemic. Firstly, according to statistics, the majority of the respondents agreed strongly that social media is a driving force in safeguarding health, remaining home safe and sound, being aware of figures and reports spread through media, and adjusting with monotony. Knowledge through media helps to increase the washing of hands, as well as the use of a handkerchief or sanitizer, and to reduce touching of the eyes, nose, and mouth. Secondly, lockdowns or quarantines are novel concepts to most; however, they are vital in reducing transmission. Due to COVID-19's infectivity, today's primary remedy is to stay home and follow social distancing measures. Thirdly, social media is not a government agency or solicit organization where people blindly rely on the news. Instead, people's confidence in statistics, data, and outcomes mainly derive from posting on social media, as well as interacting with Facebook, Twitter, or WhatsApp updates. Lastly, exploratory factor analysis (EFA) revealed a positive relationship between social media and health outcomes, suggesting that health safeguarding, lockdowns, reliance on media figures, and psychological resentment are fortified through social media.

5. Conclusions

Social media is the most convenient way to access information, share an opinion, and evaluate its justification. It has been vital in following COVID-19 and its traumatic death toll. This study investigated the impact of social media usage on the COVID-19 pandemic through an online-based questionnaire. The COVID-19 outbreak has become a global catastrophe. Our study tried to evaluate latent information accessed through social media on the perception of health issues, quarantine maintenance, data validation and accuracy, and psychological monotony related to COVID-19.

Empirical evidence through factor analysis portrayed a well-fitted model explaining 78% of the variance. Path analysis revealed that health-related issues and safety were significantly associated at the 1% level with quarantines, media figure accuracy, and the psychological effect. The hypothetical factors were positively related to each other through social media. Univariate analysis highlighted issues such as the health consciousness of social media users related to knowledge about COVID-19 and its symptoms, risk assessment, and social media accuracy. Factor analysis established four pillars: knowledge and safeguarding health through media, self-detainment at home, social media's accuracy, and psychological monotony. The results indicated a positive impact on health consciousness in terms of washing hands, using handkerchiefs or tissue, and staying safe at home as much as possible. Thus, social media has had a positive impact on improving humankind and conquering COVID-19. Individuals worldwide have faced enormous stress related to health concerns stemming from the COVID-19 pandemic, which has escalated social media use. People used social media to seek accurate health information and stay in touch with coworkers, peers, friends, and family members. Precautionary health practices are regarded as the most effective preventive measures for COVID-19 transmission. Even though a vaccination program has begun, both vaccinated and unvaccinated people are advised to take preventive measures [2,24]. People use social media and other educational technology platforms to gain health-related information and to seek major emotional, informational, educational, and peer support. More individuals are utilizing social media, increasing access to health-related information. The introduction of facemasks, handwashing, and social seclusion foreshadowed peer, informational, and emotional support. Some limitations of this study were that it did not rely on theories such as knowledge, attitudes, and practices (KAP) [44–46] or psychometric scales. Secondly, this study investigated COVID-19 without considering mental condition, sleep quality, or crucial variables. Overall, this study mostly exhibited a positive effect of social media on the knowledge of students.

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References

1. Hua, J.; Shaw, R. Corona virus (COVID-19) “infodemic” and emerging issues through a data lens: The case of China. *Int. J. Environ. Res. Public Health* **2020**, *17*, 2309. [\[CrossRef\]](#) [\[PubMed\]](#)
2. Zhang, H.; Shaw, R. Identifying Research Trends and Gaps in the Context of COVID-19. *Int. J. Environ. Res. Public Health* **2020**, *17*, 3370. [\[CrossRef\]](#) [\[PubMed\]](#)
3. Fernandes, N. Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy. *SSRN Electron. J.* **2020**. [\[CrossRef\]](#)
4. Arshad, A.; Shajeea, M.B.; Naseem, A.; Asadullah, A.A.; Ayman, I. The Outbreak of Coronavirus Disease 2019 (COVID-19)—An Emerging Global Health Threat. *J. Infect. Public Health* **2020**, *13*, 644–646. [\[CrossRef\]](#)
5. Lai, C.-C.; Wang, C.-Y.; Wang, Y.-H.; Hsueh, S.-C.; Ko, W.-C.; Hsueh, P.-R. Global epidemiology of coronavirus disease 2019 (COVID-19): Disease incidence, daily cumulative index, mortality, and their association with country healthcare resources and economic status. *Int. J. Antimicrob. Agents* **2020**, *55*, 105946. [\[CrossRef\]](#)
6. Shaman, J.; Karspeck, A.; Yang, W.; Tamerius, J.; Lipsitch, M. Real-time influenza forecasts during the 2012–2013 season. *Nat. Commun.* **2013**, *4*, 2837. [\[CrossRef\]](#)
7. Zayed, N.M.; Edeh, F.O.; Islam, K.M.A.; Nitsenko, V.; Polova, O.; Khaietska, O. Utilization of Knowledge Management as Business Resilience Strategy for Microentrepreneurs in Post-COVID-19 Economy. *Sustainability* **2022**, *14*, 15789. [\[CrossRef\]](#)
8. Anwar, S.; Nasrullah, M.; Hosen, M.J. COVID-19 and Bangladesh: Challenges and How to Address Them. *Front. Public Health* **2020**, *8*, 154. [\[CrossRef\]](#)
9. Edeh, F.O.; Zayed, N.M.; Nitsenko, V.; Brezhnieva-Yermolenko, O.; Negovska, J.; Shtan, M. Predicting Innovation Capability through Knowledge Management in the Banking Sector. *J. Risk Financ. Manag.* **2022**, *15*, 312. [\[CrossRef\]](#)
10. Zayed, N.M.; Edeh, F.O.; Islam, K.M.A.; Nitsenko, V.; Dubovyk, T.; Doroshuk, H. An Investigation into the Effect of Knowledge Management on Employee Retention in the Telecom Sector. *Adm. Sci.* **2022**, *12*, 138. [\[CrossRef\]](#)
11. Edeh, F.O.; Zayed, N.M.; Perevozova, I.; Kryshal, H.; Nitsenko, V. Talent Management in the Hospitality Sector: Predicting Discretionary Work Behaviour. *Adm. Sci.* **2022**, *12*, 122. [\[CrossRef\]](#)
12. Zayed, N.M.; Edeh, F.O.; Darwish, S.; Islam, K.M.A.; Kryshal, H.; Nitsenko, V.; Stanislavsky, O. Human Resource Skill Adjustment in Service Sector: Predicting Dynamic Capability in Post COVID-19 Work Environment. *J. Risk Financ. Manag.* **2022**, *15*, 402. [\[CrossRef\]](#)
13. Islam, M.S.; Sujan, M.S.H.; Tasnim, R.; Ferdous, M.Z.; Masud, J.H.B.; Kundu, S.; Mosaddek, A.S.M.; Choudhuri, M.S.K.; Kircaburun, K.; Griffiths, M.D. Problematic internet use among young and adult population in Bangladesh: Correlates with lifestyle and online activities during the COVID-19 pandemic. *Addict. Behav. Rep.* **2020**, *12*, 100311. [\[CrossRef\]](#) [\[PubMed\]](#)
14. Bonaccorsi, G.; Pierri, F.; Cinelli, M.; Flori, A.; Galeazzi, A.; Porcelli, F.; Schmidt, A.L.; Valensise, C.M.; Scala, A.; Quattrocchi, W.; et al. Economic and social consequences of human mobility restrictions under COVID-19. *Proc. Natl. Acad. Sci. USA* **2020**, *117*, 15530–15535. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Joosten, T. *Social Media for Educators: Strategies and Best Practices*; John Wiley & Sons: Hoboken, NJ, USA, 2012.
16. Saydan, R.; Dölek, B. The impact of social media advertisement awareness on brand awareness, brand image, brand attitude and brand loyalty: A research on university students. *Int. J. Contemp. Econ. Adm. Sci.* **2019**, *9*, 470–494.
17. Souravlas, S.; Anastasiadou, S. Pipelined Dynamic Scheduling of Big Data Streams. *Appl. Sci.* **2020**, *10*, 4796. [\[CrossRef\]](#)
18. Souravlas, S.; Anastasiadou, S.; Katsavounis, S. More on Pipelined Dynamic Scheduling of Big Data Streams. *Appl. Sci.* **2021**, *11*, 61. [\[CrossRef\]](#)

19. Dutta, A. Impact of Digital Social Media on Indian Higher Education: Alternative Approaches of Online Learning during COVID-19 Pandemic Crisis. *Int. J. Sci. Res. Publ.* **2020**, *10*, 604–611. [\[CrossRef\]](#)
20. Cinelli, M.; Quattrocioni, W.; Galeazzi, A.; Valensise, C.M.; Brugnoli, E.; Schmidt, A.L.; Zola, P.; Zollo, F.; Scala, A. The COVID-19 social media infodemic. *Sci. Rep.* **2020**, *10*, 16598. [\[CrossRef\]](#)
21. Pennycook, G.; McPhetres, J.; Zhang, Y.; Lu, J.G.; Rand, D.G. Fighting COVID-19 Misinformation on Social Media: Experimental Evidence for a Scalable Accuracy-Nudge Intervention. *Psychol. Sci.* **2020**, *31*, 770–780. [\[CrossRef\]](#)
22. Depoux, A.; Martin, S.; Karafillakis, E.; Preet, R.; Wilder-Smith, A.; Larson, H. The pandemic of social media panic travels faster than the COVID-19 outbreak. *J. Travel Med.* **2020**, *27*, taaa031. [\[CrossRef\]](#) [\[PubMed\]](#)
23. Ni, M.Y.; Yang, L.; Leung, C.M.C.; Li, N.; Yao, X.I.; Wang, Y.; Leung, G.M.; Cowling, B.J.; Liao, Q. Mental Health, Risk Factors, and Social Media Use During the COVID-19 Epidemic and Cordon Sanitaire Among the Community and Health Professionals in Wuhan, China: Cross-Sectional Survey. *JMIR Ment. Health* **2020**, *7*, e19009. [\[CrossRef\]](#) [\[PubMed\]](#)
24. Sharif, N.; Opu, R.R.; Alzahrani, K.J.; Ahmed, S.N.; Islam, S.; Mim, S.S.; Khan, F.B.; Zaman, F.; Dey, S.K. The positive impact of social media on health behavior towards the COVID-19 pandemic in Bangladesh: A web-based cross-sectional study. *Diabetes Metab. Syndr. Clin. Res. Rev.* **2021**, *15*, 102206. [\[CrossRef\]](#) [\[PubMed\]](#)
25. Ngai, C.S.B.; Singh, R.G.; Lu, W.; Koon, A.C. Grappling With the COVID-19 Health Crisis: Content Analysis of Communication Strategies and Their Effects on Public Engagement on Social Media. *J. Med. Internet Res.* **2020**, *22*, e21360. [\[CrossRef\]](#)
26. Eysenbach, G. Can Tweets Predict Citations? Metrics of Social Impact Based on Twitter and Correlation with Traditional Metrics of Scientific Impact. *J. Med. Internet Res.* **2011**, *13*, e123. [\[CrossRef\]](#)
27. Henrich, N.; Holmes, B. Communicating during a pandemic: Information the public wants about the disease and new vaccines and drugs. *Health Promot. Pract.* **2011**, *12*, 610–619. [\[CrossRef\]](#) [\[PubMed\]](#)
28. Ahmad, A.R.; Murad, H.R. The Impact of Social Media on Panic During the COVID-19 Pandemic in Iraqi Kurdistan: Online Questionnaire Study. *J. Med Internet Res.* **2020**, *22*, e19556. [\[CrossRef\]](#)
29. Doza, B.; Shammil, M.; Bahlman, L.; Islam, A.R.M.T.; Rahman, M. Psychosocial and Socio-Economic Crisis in Bangladesh Due to COVID-19 Pandemic: A Perception-Based Assessment. *Front. Public Health* **2020**, *8*, 341. [\[CrossRef\]](#)
30. Islam, M.M.; Islam, M.M.; Ahmed, F.; Rumana, A.S. Creative social media use for COVID-19 prevention in Bangladesh: A structural equation modeling approach. *Soc. Netw. Anal. Min.* **2021**, *11*, 1–14. [\[CrossRef\]](#)
31. Radwan, E.; Radwan, A. The Spread of the Pandemic of Social Media Panic during the COVID-19 Outbreak. *Eur. J. Environ. Public Health* **2020**, *4*, em0044. [\[CrossRef\]](#)
32. Paul, L. *Encyclopedia of Survey Research Methods*; Sage Publications, Inc.: Thousand Oaks, CA, USA, 2008. [\[CrossRef\]](#)
33. Jarvis, C.B.; MacKenzie, S.B.; Podsakoff, P.M. A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *J. Consum. Res.* **2003**, *30*, 199–218. [\[CrossRef\]](#)
34. Williams, L.J.; Edwards, J.R.; Vandenberg, R.J. Recent Advances in Causal Modeling Methods for Organizational and Management Research. *J. Manag.* **2003**, *29*, 903–936. [\[CrossRef\]](#)
35. Martens, M.P. The Use of Structural Equation Modeling in Counseling Psychology Research. *Couns. Psychol.* **2005**, *33*, 269–298. [\[CrossRef\]](#)
36. Roger, M. *The SAGE Handbook of Quantitative Methods in Psychology*; Sage Publications, Inc.: Thousand Oaks, CA, USA, 2009. [\[CrossRef\]](#)
37. Hancock, G.R.; Stapleton, L.M.; Mueller, R.O. *The Reviewer's Guide to Quantitative Methods in the Social Sciences*, 2nd ed.; Routledge: New York, NY, USA, 2018. [\[CrossRef\]](#)
38. Kieffer, M.J. Converging Trajectories: Reading Growth in Language Minority Learners and Their Classmates, Kindergarten to Grade 8. *Am. Educ. Res. J.* **2011**, *48*, 1187–1225. [\[CrossRef\]](#)
39. Bollen, K.A. *Structural Equations with Latent Variables*; John Wiley & Sons, Inc.: Hoboken, NJ, USA, 2014. [\[CrossRef\]](#)
40. Howard, A.L. Handbook of Structural Equation Modeling. *Struct. Equ. Model. A Multidiscip. J.* **2013**, *20*, 354–360. [\[CrossRef\]](#)
41. Hu, L.T.; Bentler, P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. Multidiscip. J.* **1999**, *6*, 1–55. [\[CrossRef\]](#)
42. Tabri, N.; Elliott, C.M. Principles and Practice of Structural Equation Modeling. *Can. Grad. J. Sociol. Criminol.* **2012**, *1*, 59–60. [\[CrossRef\]](#)
43. Byrne, B.M. *Structural Equation Modeling with EQS: Basic Concepts, Applications, and Programming*, 2nd ed.; Routledge: New York, NY, USA, 2013; pp. 1–440. [\[CrossRef\]](#)
44. Hesarakhi, M.; Akbarizadeh, M.; Ahmadidarrehshima, S.; Moghadam, M.P.; Izadpanah, F. Knowledge, attitude, practice and clinical recommendations of health care workers towards COVID-19: A systematic review. *Rev. Environ. Health* **2020**, *36*, 345–357. [\[CrossRef\]](#)
45. Kumar, B.; Pinky, S.D.; Nurudden, A. Knowledge, attitudes and practices towards COVID-19 guidelines among students in Bangladesh. *Soc. Sci. Humanit. Open* **2021**, *4*, 100194. [\[CrossRef\]](#)
46. Rahman, M.; Khan, S.J.; Sakib, M.S.; Halim, A.; Rahman, M.; Asikunnaby; Jhinuk, J.M. COVID-19 responses among university students of Bangladesh: Assessment of status and individual view toward COVID-19. *J. Hum. Behav. Soc. Environ.* **2021**, *31*, 512–531. [\[CrossRef\]](#)
47. Fedushko, S.; Ustyianovych, T. E-Commerce Customers Behavior Research Using Cohort Analysis: A Case Study of COVID-19. *J. Open Innov. Technol. Mark. Complex.* **2022**, *8*, 12. [\[CrossRef\]](#)

48. Hossain, M.A.; Hossain, K.M.A.; Saunders, K.; Uddin, Z.; Walton, L.M.; Raigangar, V.; Sakel, M.; Shafin, R.; Kabir, F.; Faruqui, R.; et al. Prevalence of Long COVID symptoms in Bangladesh: A prospective Inception Cohort Study of COVID-19 survivors. *BMJ Glob. Health* **2021**, *6*, e006838. [[CrossRef](#)] [[PubMed](#)]
49. Shammi, M.; Doza, B.; Islam, A.R.M.T.; Rahman, M. COVID-19 pandemic, socioeconomic crisis and human stress in resource-limited settings: A case from Bangladesh. *Heliyon* **2020**, *6*, e04063. [[CrossRef](#)] [[PubMed](#)]
50. Hu, Z.; Khokhlov, Y.; Sydorenko, V.; Opirskyy, I. Method for Optimization of Information Security Systems Behavior under Conditions of Influences. *Int. J. Intell. Syst. Appl.* **2017**, *9*, 46. [[CrossRef](#)]
51. Limaye, R.J.; Sauer, M.; Ali, J.; Bernstein, J.; Wahl, B.; Barnhill, A.; Labrique, A. Building trust while influencing online COVID-19 content in the social media world. *Lancet Digit. Health* **2020**, *2*, e277–e278. [[CrossRef](#)]
52. O'Sullivan, E.; Cutts, E.; Kavikondala, S.; Salcedo, A.; D'Souza, K.; Hernandez-Torre, M.; Anderson, C.; Tiwari, A.; Ho, K.; Last, J. Social Media in Health Science Education: An International Survey. *JMIR Med. Educ.* **2017**, *3*, e6304. [[CrossRef](#)]
53. Kim, L.; Fast, S.M.; Markuzon, N. Incorporating media data into a model of infectious disease transmission. *PLoS ONE* **2019**, *14*, e0197646. [[CrossRef](#)]
54. Di Blasi, M.; Giardina, A.; Giordano, C.; Coco, G.L.; Tosto, C.; Billieux, J.; Schimmenti, A. Problematic video game use as an emotional coping strategy: Evidence from a sample of MMORPG gamers. *J. Behav. Addict.* **2019**, *8*, 25–34. [[CrossRef](#)]
55. Hawryluck, L.; Gold, W.L.; Robinson, S.; Pogorski, S.; Galea, S.; Styra, R. SARS Control and Psychological Effects of Quarantine, Toronto, Canada. *Emerg. Infect. Dis.* **2004**, *10*, 1206–1212. [[CrossRef](#)]
56. Nitsenko, V. What is the Government Really Pursuing by Introducing Quarantine Measures in the Conditions of COVID-19? The Case of Ukraine. *Ukr. Policymaker* **2021**, *9*, 69–77. [[CrossRef](#)]
57. Dorfman, N. "Social-Distancing" as a Chance to Revise the Paradoxes of Humanistic Philosophy: Personality Vs. Identity in Online Artistic Practices of the Pandemic. *Philos. Cosmol.* **2021**, *27*, 116–125. [[CrossRef](#)] [[PubMed](#)]
58. Pooran, S. Global Health Security in a New World Order: Winning the Battle but Losing the War. *Future Hum. Image* **2022**, *18*, 42–55. [[CrossRef](#)]
59. Malysheva, N.; Hurova, A. New Frontiers of Sustainable Human's Activities: Challenges for Legal Order of Space Mining Economy. *Adv. Space Law* **2021**, *8*, 76–85. [[CrossRef](#)]
60. Veljanovska Blazhevskaja, K. Populism Versus a Transparently Informed Public: The State of the Media Space in South East Europe. *Ukr. Policymaker* **2022**, *11*, 92–102. [[CrossRef](#)]

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