Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Knowledge, attitudes and practices towards COVID-19 guidelines among students in Bangladesh

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ABSTRACT

This paper explores the level of knowledge, attitudes and practices towards COVID-19 guidelines among the students in Bangladesh. In achieving this objective, this paper used primary data collected from 1822 students wherein three different Likert scales and a one-way ANOVA test were used to assess knowledge, attitudes, and practices (KAP) scores as well as mean differences with respect to different variables. This research reveals that the majority of students had a higher level of knowledge and a positive attitudes towards the COVID-19 guidelines. Contrarily, only 0.22 percent of students showed a strong compliance towards COVID-19 guidelines while the majority of students (60.54 percent) had rather poor adherence which is an alarming finding. Hence, reopening the educational institutions in Bangladesh amid this second wave of the pandemic is not advisable yet. Nevertheless, reinforcing the preventive measures through campaigns or online discussion is crucial to persuade people to follow the preventive guidelines. In addition to this, urgent vaccination of all students and teachers is highly recommended to contain this global disease in an attempt to reopen the on-campus education system as soon as possible.

1. Introduction

The recent outbreak of respiratory illness caused by a novel (new) coronavirus named (SARS-CoV-2) that was first detected in Wuhan City, Hubei Province, China in December 2019 has kept ravaging the world by spreading to at least 213 countries attributing 3.85 million deaths and 178.1 million confirmed cases till 17 June 2021 (Worldometers, 2021). As a consequence, the World Health Organization (WHO) declared it a global pandemic on March 12, 2020 due to its high infectious rate with tremendous transmission dynamics (Gumbrecht & Howard, 2020). SARS-CoV-2 is the third coronavirus to emerge in the human population in the past two decades, following the outbreaks of SARS-CoV in 2002 and MERS-CoV in 2012.

Since COVID-19 is an emerging and rapidly evolving situation, even after multiple trials to prove the efficacy of potential drugs that can cure the disease, promising progress seems still far-off (Maragakis, 2020). Hence, following COVID-19 basic infection prevention guidelines as per WHO protocols are the cornerstones of reducing the transmission and they are practicing social-distance (at least 6 feet away from others), maintaining hand hygiene (frequent hand washing with soap-water or alcohol-based sanitizer), use of facemasks in public settings, sneezing on elbows and quarantining of the exposed individuals to COVID-19 (CDC, 2020).

Ever since the first case was recorded in Bangladesh on March 8, 2020, the exponential rise of case number and death rates have made Bangladesh one of the worst-hit countries in the world. Up to 17 June 2021, global COVID-19 cases crossed 178 million (Worldometers, 2021), wherein Bangladesh reported 0.83 million infected cases and 13, 282 deaths (Coronatracker Bangladesh, 2021). Both the daily new cases (see Fig. 1) and daily new deaths (see Fig. 2) in Bangladesh are increasing over time during this second wave of coronavirus.

In light of flattening the coronavirus curve, a large number of schools, colleges and universities all over the world have suspended or canceled all their face-to-face campus activities and rapidly transitioned to online learning instead. With no exception, the government of Bangladesh has also announced to close all the educational institutions on March 16, 2020 and extended the closure till June 30, 2021 (The Daily Star, 14 June 2021). Meanwhile, Bangladesh has adapted distance

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learning and many institutions are conducting online classes and tests according to their logistics support and choices. This new norm, however, is creating difficulties for both the students and teachers. On one hand, a large number of students are not equipped with adequate devices or a strong broadband network and so, they have to depend on unstable mobile data which is costly as well. On the other hand, many of the teachers have the lack of required technical skills to conduct online classes. Furthermore, both the teachers and students are yet to be at ease in interacting through screens rather than the traditional face-to-face communication (Tariq & Fami, 2020).

Regarding the public examinations, the education ministry has already canceled the higher secondary certificate and its equivalent examinations, which were scheduled to start from April 01, 2020 (The Business Standard, 2020). Primary school certificate and junior school certificate examinations were canceled earlier too due to the coronavirus situation (Alamgir, 2020). Most importantly, the pandemic-induced closure has significantly affected the public universities of Bangladesh taking them back in the loops of session-jams which they were fighting against to reverse in the pre-pandemic period. Most undergraduate students have already lost an academic calendar year, yet there is no sight of reopening the universities in foreseeable future (Anwar, Nasrullah, & Hosen, 2020).

After three months of apparent strict containment, the offices, garment factories, courts, shopping malls, public transports all have reopened gradually to move the wheel of the economy. Only the educational institutes have remained closed with no specific decisions taking into account yet. This, in consequence, raised uncertainty among a group of students compelling them to protest against the government's decision on extending the closure of the universities in different sites of social media whereas the other group is content with the pace of online classes and support the decision (Shovon, 2020). Unfortunately, Bangladesh experienced the second wave of Coronavirus which peaked in the second week of April with over 3500 new cases in a day (Xinhuanet, 2021). This led to a full-fledged nationwide lockdown starting from April 5 extending twice till May 16 compelling the closure of the educational institutions till the Muslim religious Eid holidays (Baibhawi, 2021).

It is a well-known fact that to address a public health issue, such as the COVID-19 global crisis, people's knowledge and awareness play a crucial role as adherence to the preventive measures depend on the level of the understanding about the disease and grave consequences are followed by if the preventive controls are not taken properly (Kumar & Pinky, 2020). Again, students of secondary education (grade 6–10), higher secondary (grade 11-12) and university going students constitute a set of the population whose lives have witnessed a major change throughout this pandemic leaving their academic calendars in disarray. Not only these, many students, especially female students are getting married at their very early ages, and they are suffering from social and domestic violence, economic hardship, mental health crisis, and so on (Kumar et al., 2021).

Knowledge, attitudes and practices (KAP) survey is an important tool that represents the collective information on what is already known, perceived and implemented by a certain group of population. Hence, assessing the knowledge, perspectives and practices toward COVID-19 guidelines among students are vital since their perception and practice will have a significant impact on the spread of the pandemic once the educational institutions are opened. Similarly, student's deeper insight into the existing knowledge, responsive attitudes, and healthy precautionary practices towards the guidelines may curb the infection rate of coronavirus breaking the important chain of transmission in the community (Elmer et al., 2020).

Although Ferdous et al. (2020) and Haque et al. (2020) have carried out research on assessing the knowledge, awareness, and practices towards the COVID-19, they have considered all classes of people of Bangladesh in their studies. Thus far, no study has been carried out on assessing the knowledge, attitudes, and practices towards the COVID-19 guidelines taking students of Bangladesh as the target population. Hence, this study is pivotal as it will denote the adherence to the given protocols by the WHO and as a result, will determine the risks of reopening the educational institutions in the near future. On that account, the results of this study will have significant implications for policymakers and further project planners as well.

2. Materials and methods

2.1. Study design and sample selection

This is a cross-sectional study conducted among the students of Secondary (grade 6 to 10), Higher-Secondary (grade 11 to 12), and Tertiary (Undergraduate and Master's) level in Bangladesh. This paper did not consider primary (grade 1 to 5) level students as they were unable to make decisions on their own capacity and generally do not use Internet for responding to this survey questionnaire. Amid this pandemic, collecting data from the field through face to face interview

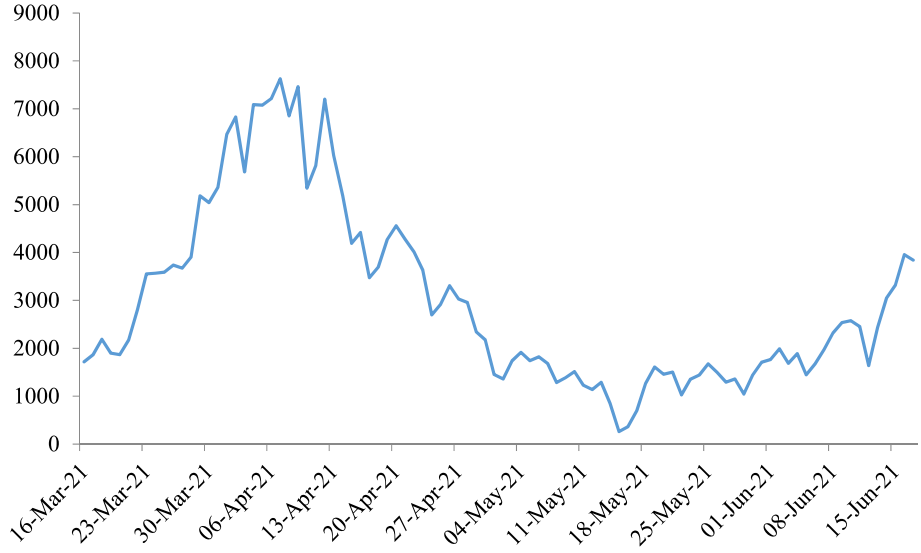

Fig. 1. Daily new cases in Bangladesh.
Source: Worldometer

was impossible due to social distancing measures, restricted movement, and lockdowns caused by coronavirus pandemic. Hence, data were collected online using Google Forms via a self-reported questionnaire, and following snowball sampling, the link of the questionnaire was sent to the students of different institutions who filled up and forwarded it to others. Moreover, it was also shared in social media platforms, namely Facebook, LinkedIn, Twitter, WhatsApp, Messenger, and so on so that the sample size becomes larger as the larger the sample size represents the higher external validity and the greater generalizability of the study (Cavana et al., 2001). From the latest statistics, it is found that Bangladesh has about 18,405,709 students from secondary to tertiary level (BANBEIS, 2018). To achieve the study objectives and sufficient statistical power, the representative sample size was calculated with a sample size calculator (RAOSOFT, 2020) and using a margin of error of ±4 percent, a confidence level of 99 percent, a 50 percent response distribution, and 18,405,709 students, the sample size calculator reached at 1037 respondents.

Based on the guidelines for the community of COVID-19 by the World Health Organization (WHO), the questionnaire was developed. The online survey was conducted from October 10, 2020 to November 16, 2020. In the online survey questionnaire, respondents were informed well about this research and their consents to participation were also taken. All the procedures performed in this research related to human participants followed the ethical standards of the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Finally, 1822 data were collected. After collection, data were edited, sorted and coded for analysis.

2.2. Measurement of students' knowledge, attitudes and practices of COVID-19 guidelines

Respondents were asked ten statements regarding knowledge of COVID-19 guidelines to respond as either true or false or don't know option. Among ten statements, five statements were given correctly and the rest five statements were given wrongly. Regarding correct statements, false and don't know responses were measured with a score of 0 while true answers with 1. On the other hand, true and don't know responses were measured with a score of 0 and false answers with 1 in the case of wrong statements. The total score for knowledge ranged from 0 to 10. With scores 0 to 5 indicates a lower level of knowledge of COVID-19 guidelines while scores 6 to 7 and 8 to 10 indicate moderate and higher level of knowledge, respectively. Internal reliability of items was evaluated using Cronbach's α. Here, Cronbach's alpha coefficient was 0.66, implying internal reliability.

The scores of attitudes were calculated based on the respondents' answers to each attitudinal statement, 1 = undecided, 2 = disagreed, and 3 = agreed. Scores were calculated by averaging respondents' answers to the six statements. Total scores ranged from 6 to 18 with scores 6 to 9 denoting the lower or negative attitudes while 10 to 14 and 15 to 18 signifying the moderate and the higher or positive attitudes, respectively. The internal reliability of items were assessed by Cronbach's α. Herein, Cronbach's alpha coefficient was 0.64, marking internal reliability.

Regarding practices of COVID-19 guidelines, respondents were asked to respond "always = 3" or "frequently = 2" or "sometimes = 1" or "never = 0" to the given 12 items. The total score ranged from 0 to 36 with scores 0 to 18 indicating the lower level of practices, scores 19 to 27, and 28 to 36 stating the moderate and higher level of practices, respectively. For internal reliability, the Likert scales were assessed using Cronbach's α. Cronbach's alpha coefficient was 0.80, reflecting internal reliability.

2.3. Empirical methods

This study primarily employed descriptive statistics to tabulate the frequency distribution of socio-demographic and institutional features of the students. Each item of students' knowledge, attitudes, and practices towards COVID-19 guidelines are measured through Relative Importance Index (RII) following (Somiah et al., 2015; Badu et al., 2013; Aziz et al., 2016). The formula for calculating Relative Importance Index is as follows:

$$RII = \frac{\sum Pn}{QN} \quad (1)$$

where P is the rating given to each item by the respondents, n is number of responses in each likert, N is the total number of respondents, and Q is the highest point of the likert scale.

On the other hand, a one-way Analysis of Variance (ANOVA) was used to assess differences in mean values for knowledge, attitudes, and practices (KAP) scores of COVID-19 guidelines with respect to different factors. The overall mean differences were estimated using a Bartlett test as the scores were continuous (Wetzels et al., 2012; O'brien, 1979). All analyses were conducted using SPSS 24 software.

3. Results and discussion

3.1. Socio-demographic features of the students

The socio-demographic features of the students are analyzed by frequency distribution and the estimated findings are presented in the following table.

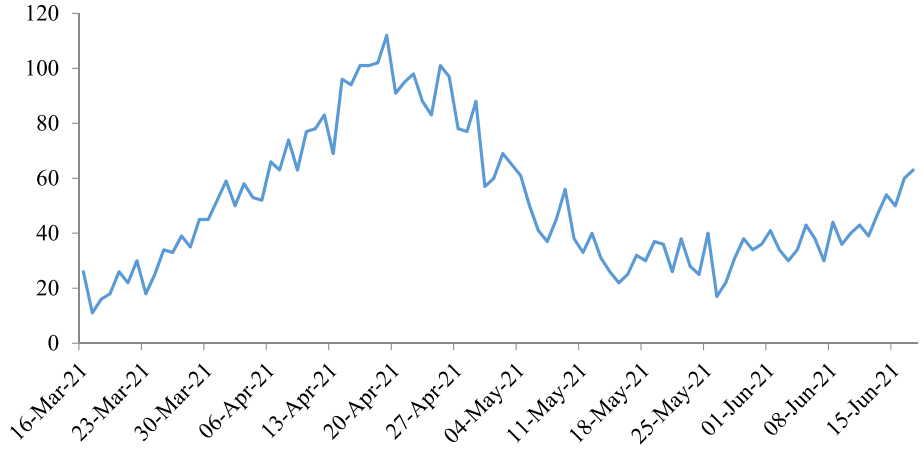

Fig. 2. Daily new deaths in Bangladesh.
Source: Worldometer

Table 1 shows that the majority of the participants (53.95 percent) were aged of 21–25 years and the lowest percent of students (3.57 percent) was '31 years and above' group. It is also found that the majority of the students (53.20 percent) were male while 44.10 percent were female. Besides, this paper finds that the majority of the participants studied in undergraduate level and lived in urban areas. It is found that majority of the students used the Internet by more than 3 h a day and watched TV or read Newspaper by less than 1 h a day. Table 1 also reveals that the total family income per month of the majority students (28.02 percent) was between Tk.20,001 and Tk.30,000 while the level of education of guardian of majority students (25.60 percent) was graduation.

3.2. Students' responses to statements regarding knowledge of COVID-19 guidelines

Students' knowledge towards COVID-19 guidelines is measured by their responses to the given 10 statements using relative importance index, and the estimated findings are presented in Table 2.

Among the given ten statements, students had knowledge of COVID-19 guidelines mostly on 'wearing a mask is mandatory for the public' which is indicated by maximum value of RII (0.89) and rank 1. Similarly, students rated 'pregnant women, elderly people, and adults with chronic disease should take extra precautions against coronavirus' as the second ranked of knowledge regarding COVID-19 guidelines. On the other hand, students had the lowest level of knowledge on 'maintaining 2 feet distance among one another is enough to prevent droplet transmission' which is depicted by the lowest value of RII (0.49) and rank 10.

Table 1
Social and demographic features of the students.

Variables	Indicators	Frequency	Percentage
Age	15 years and below	84	04.61
	16–20 years	483	26.51
	21–25 years	983	53.95
	26–30 years	207	11.36
	31 years and above	65	03.57
Sex	Male	969	53.20
	Female	804	44.10
	Preferred not to say	49	02.70
Level of study	Secondary	135	07.40
	Higher Secondary	289	15.90
	Undergraduate	1088	59.70
	Masters	310	17.00
Areas of living	Rural	505	27.70
	Sub-urban	375	20.60
	Urban	942	51.70
Duration of using Internet per day	Don't use regularly	34	01.90
	Less than 1 h	141	07.07
	1–2 h	303	16.60
	2–3 h	365	20.00
	More than 3 h	979	53.70
Duration of watching TV/ reading Newspaper per day	Don't watch/read regularly	293	16.10
	Less than 1 h	642	35.20
	1–2 h	466	25.60
	2–3 h	237	13.00
	More than 3 h	184	10.10
Total family income per month	Less than Tk.10,000	313	17.20
	Tk.10,001 to Tk.20,000	488	26.80
	Tk.20,001 to Tk.30,000	511	28.02
	More than Tk.30,001	510	27.98
Education of guardian	Sign only	146	08.00
	Primary	163	08.90
	Secondary	290	15.90
	Higher Secondary	384	21.10
	Graduation	466	25.60
	Post-graduation	373	20.50

Source: Online survey, 2020

Table 2
Students' responses to statements regarding knowledge of COVID-19 guidelines.

No.	Statements	T	F	DK	RII	Rank
i.	Wearing a mask is mandatory for the public	1625	161	36	0.89	1
ii.	Pregnant women, elderly people, and adults with chronic disease should take extra precautions against coronavirus	1604	117	101	0.88	2
iii.	Avoiding visits to crowded places can be a way to prevent high rates of droplet transmission	1587	148	87	0.87	3
iv.	After being in a public place, after nose-blowing, coughing or sneezing, people must wash their hands with soap and water, or use hand sanitizer containing at least 60 percent alcohol, for at least 20 s	1506	164	152	0.83	4
v.	Self-isolation is important if someone develops any flu-like symptoms	1473	249	100	0.81	5
vi.	Only mouth is the routes of entry of the coronavirus	518	1158	146	0.64	6
vii.	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19	551	1128	143	0.62	7
viii.	Washing hands for 10 s with soap-water is enough to kill the virus	559	1129	134	0.62	8
ix.	Wearing a surgical mask can fully protect someone from getting coronavirus	612	993	217	0.55	9
x.	Maintaining 2 feet distance among one another is enough to prevent droplet transmission	848	888	86	0.49	10

Note: T = True, F = False, and DK = Don't Know.
Source: Online survey, 2020

3.3. Students' responses to attitudinal statements towards COVID-19 guidelines

Students' attitudes towards COVID-19 guidelines are measured by their responses to the given 6 statements using relative importance index, and the estimated findings are presented in Table 3.

Among given six statements, students had the highest (positive) attitudes towards COVID-19 guidelines on 'isolation and self-quarantining for 14 days is important to safeguard others' which is indicated by maximum value of RII (0.95) and rank 1. Similarly, students rated 'social

Table 3
Students' responses to attitudinal statements regarding COVID-19 guidelines.

No.	Statements	A	D	U	RII	Rank
i.	Isolation and self-quarantining for 14 days is important to safeguard others	1619	142	61	0.95	1
ii.	Social distancing is necessary to maintain everywhere	1574	178	70	0.94	2
iii.	Wearing a mask is effective as a preventive measure	1417	329	76	0.91	3
iv.	Keeping educational institutions closed can prevent COVID-19 explosion	1263	437	122	0.88	4
v.	Bangladesh may experience a second wave in winter	1352	224	246	0.87	5
vi.	Bangladesh is in a good position in controlling the coronavirus	522	1123	177	0.73	6

Note: A = Agreed, D = Disagreed, and U = Undecided.
Source: Online survey, 2020

distancing is necessary to maintain everywhere' as the second ranked of attitudes regarding COVID-19 guidelines. On the other hand, students had the lowest level of attitude on 'Bangladesh is in a good position in controlling the coronavirus' which is depicted by the lowest value of RII (0.73) and rank 6.

3.4. Students' responses to statements regarding practices of COVID-19 guidelines

Students' practices towards COVID-19 guidelines are measured by their responses to the given 12 statements using relative importance index, and the estimated findings are presented in Table 4.

Students had the highest level of practices towards COVID-19 guidelines on 'I wash fruits and vegetables well before eating' among twelve statements, which is indicated by maximum value of RII (0.85) and rank 1. Similarly, students rated 'I wear a mask when leaving home' as the second ranked of practices regarding COVID-19 guidelines. On the other hand, students had the lowest level of practices on 'I visit restaurants/cafes meanwhile' which is depicted by the lowest value of RII (0.35) and rank 12.

3.5. Level of students' knowledge, attitudes and practices regarding COVID-19 guidelines

The level of students' knowledge, attitudes, and practices regarding COVID-19 guidelines is presented in Fig. 3.

Fig. 3 shows that most of the students (49.78 percent) had the higher level of knowledge regarding COVID-19 guidelines while 26.67 percent had a moderate and 23.55 percent had a lower level of knowledge.In the case of attitudes towards COVID-19 guidelines, majority of the students (64.27 percent) had the higher level (positive and optimistic) of attitudes. Not like the preceding findings, rather an alarming finding is found in the case of students' practices towards COVID-19 guidelines. That is only 0.22 percent students practiced COVID-19 guidelines highly. Contrarily, maximum students (60.54 percent) maintained the lower level of practices of COVID-19 guidelines.

Table 4
Students' responses to statements regarding practice of COVID-19 guidelines.

No.	Statements	A	F	S	N	RII	Rank
i.	I wash fruits and vegetables well before eating	1277	319	188	38	0.85	1
ii.	I wear a mask when leaving home	1169	442	178	33	0.84	2
iii.	I wash my hands with soap and water/rubbing alcohol for at least 20 s	992	486	281	63	0.77	3
iv.	I avoid some cultural behaviors like shaking hands	927	440	336	119	0.73	4
v.	I keep updates and follow the COVID-19 guidelines	786	629	344	63	0.72	5
vi.	I maintain a physical distance of 3 feet while being out	524	577	512	209	0.59	6
vii.	I go out of home amid COVID-19 pandemic	360	705	643	114	0.57	7
viii.	I interact with people nowadays	326	659	547	290	0.52	8
ix.	I use public transport for commuting	444	535	399	444	0.51	9
x.	I touch the surface of the mask when taking it off	416	462	462	482	0.48	10
xi.	I visit any crowded place nowadays	289	537	570	426	0.46	11
xii.	I visit restaurants/cafes meanwhile	142	452	587	641	0.35	12

Note: A = Always, F = Frequently, S = Sometimes, and N = Never.
Source: Online survey, 2020

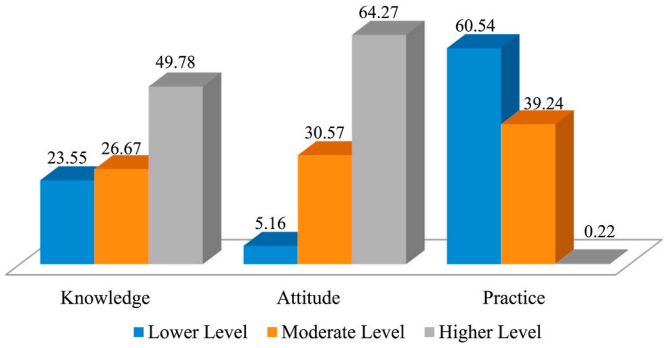

Fig. 3. Percentage of students by COVID-19 KAP score level.
Source: Online survey, 2020

3.6. Comparison of socio-demographic features, and mean KAP score

Mean knowledge, attitudes and practices towards COVID-19 guidelines with respect to different features of the students are analyzed through a one-way ANOVA test, and the estimated findings are presented in Table 5.

Table 5 reveals that the mean knowledge towards COVID-19 guidelines of the students aged between 21 and 25 years was more than other categories of ages, which is indicated by the maximum mean score, 7.43, and this mean difference is statistically significant at 1 percent level of significance. Similarly, students who are male, read in Masters level, live in rural areas, use Internet more than 3 h a day, and have family income more than Tk. 30,001 per month had the highest mean of knowledge towards COVID-19 guidelines than other categories of those variables. Mean difference of students' knowledge towards COVID-19 guidelines among different categories of each variable are found statistically significant. The findings of age and areas of living are in line with and the findings of sex, year of study and family income are not in line with Ferdous et al. (2020).

Regarding students' attitudes towards COVID-19 guidelines, it is found that students of aged 16–20 years had the maximum mean of attitudes than other categories, which is indicated by the maximum mean score, 15.25, and this mean difference is statistically significant at 1 percent level of significance. Similarly, students who were female, read in higher secondary level, lived in rural areas, used Internet more than 3 h a day, and earned family income more than Tk. 30,001 per month had the highest mean of attitudes towards COVID-19 guidelines, and the mean difference for all variables were statistically significant. The findings of age, sex, year of study and family income are in line with and the findings of areas of living are not in line with Ferdous et al. (2020).

Students of aged 16–20 years had the maximum mean of practices of COVID-19 guidelines among different categories of age, which is indicated by the maximum mean score, 23.39, and this mean difference is statistically significant at 1 percent level of significance. Similarly, students who were female, read in Masters), lived in rural areas, used Internet more than 3 h a day, and earned family income less than Tk. 10,000 per month had the highest mean of practices towards COVID-19 guidelines, and the mean difference for all variables were statistically significant. The findings of age, sex, year of study, family income and areas of living are in line with Ferdous et al. (2020).

4. Conclusion and policy recommendations

This paper principally sheds lights on two distinct research questions: (i) what is the level of students' knowledge, attitudes, and practices of COVID-19 guidelines in Bangladesh? and (ii) What factors do trigger the level of students' knowledge, attitudes, and practices of COVID-19 guidelines? This paper used primary data and several

Table 5
Comparison of social and demographic features, and mean KAP score.

Variables	Indicators	Knowledge		Attitude		Practice	
		Mean	F	Mean	F	Mean	F
Age	15 years and below	6.96	10.50*	14.38	3.88*	22.74	5.96*
	16–20 years	7.07		15.25		23.39	
	21–25 years	7.43		14.76		23.03	
	26–30 years	6.70		15.05		21.34	
	31 years and above	6.20		15.08		20.74	
Sex	Male	7.14	10.30*	14.71	23.94*	21.47	58.13*
	Female	7.32		15.28		24.57	
	Preferred not to say	7.19		13.02		21.49	
Level of study	Secondary	6.56	19.01*	14.19	6.16*	22.28	3.28**
	Higher secondary	6.51		15.34		21.89	
	Undergraduate	7.35		14.87		23.08	
	Masters	7.50		15.01		23.11	
Areas of living	Rural	7.29	7.83*	15.22	29.20*	23.34	12.83*
	Sub-urban	6.80		14.00		21.39	
	Urban	7.28		15.12		23.14	
Duration of using Internet per day	Don't use regularly	6.47	39.67*	14.26	9.44*	19.88	8.58*
	Less than 1 h	6.38		14.82		21.83	
	1–2 h	6.28		14.20		21.78	
	2–3 h	6.91		14.81		22.45	
	More than 3 h	7.71		15.21		23.55	
Duration of watching TV/reading Newspaper per day	Don't watch/read regularly	7.51	10.92*	15.26	5.91*	22.47	3.66*
	Less than 1 h	7.46		15.08		23.11	
	1–2 h	7.04		14.68		23.25	
	2–3 h	6.67		14.35		21.54	
	More than 3 h	6.74		15.14		23.07	
Total family income per month	Less than Tk.10,000	7.17	6.28*	14.89	4.68*	23.50	6.46*
	Tk.10,001 to Tk.20,000	7.01		14.59		22.69	
	Tk.20,001 to Tk.30,000	7.02		14.94		21.94	
	More than Tk.30,001	7.51		15.22		23.46	
Education of guardian	Sign only	6.93	8.01*	14.58	7.59*	21.65	7.90*
	Primary	7.12		14.22		21.76	
	Secondary	7.04		14.77		21.72	
	Higher secondary	7.12		14.62		22.77	
	Graduation	6.95		15.22		23.22	
	Post-graduation	7.78		15.39		24.21	

Note: *, ** indicate 1 percent, and 5 percent level of significance, respectively.
Source: Online survey, 2020

methods to investigate these research questions, and revealed some significant findings.

Firstly, this research ascertains that the majority of students (49.78 percent) had the higher level of knowledge of COVID-19 guidelines while 26.67 percent and 23.55 percent of students had a moderate and lower level of knowledge, respectively. Regarding attitudes, a majority of students (64.27 percent) held a very positive perspective towards the COVID-19 guidelines, followed by another (30.57 percent) who shows a moderate optimism towards it. Surprisingly yet, only 0.22 percent students had the higher level of practices of COVID-19 guidelines whereas the majority of students (60.54 percent) mentioned the lower level of practices. Secondly, this paper also reveals that the higher the students' study year, Internet use, family income, and education of guardian, the higher the extent of students' knowledge, attitudes, and practices of COVID-19 guidelines.

Based on the findings, it is recommended to keep the educational institutions closed in Bangladesh since almost no students practice the COVID-19 guidelines highly. If the institutions are reopened amid the second wave of this pandemic, these schools, colleges and universities might become the reservoirs of virus in the upcoming days. This paper also suggests the government to vaccinate students and teachers urgently and take proper initiatives to reopen institutions for starting on-campus academic activities. Otherwise, the loss of nearly one and half academic year of mass students might come across as a grave damage to the whole nation. Since the time and budget for this paper were constraintd, this paper could not take a larger sample size or employ more relevant empirical methods. Thus, the findings of this paper may not represent the actual scenario of Bangladesh. Therefore, a further in-depth study on this issue are suggested to carry out excluding these constraints.

Declaration of competing interest

Authors state that they have no competing interests.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssaho.2021.100194.

Author contributions

BK conceived and designed the study. Both BK and SDP made the questionnaire in English and translated into Bengali and set in Google Forms. While SDP wrote abstract and introduction, BK wrote methodology and conclusions and analyzed data, and both BK and AMN wrote results and discussions. Finally, BK reviewed and edited the whole paper, and all authors approved it before submission.

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Data availability

All data analyzed during this study are available online as a supplementary file.

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