

Factors affecting non-adherence to the public recommendation of mask use in Bangladesh: a nationwide survey

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ABSTRACT

Effective communication plays an important role in any uncertain situation to reduce its risks. The recent coronavirus disease (COVID-19) pandemic has created uncertainties in human lives around the world. Although infection and deaths rates are decreasing, the need for protective measures and the risk of affecting people by the virus remains high. Moreover, experts recommend that people wear face masks in public places despite vaccination. Evidence shows that people in different parts of the world tend not to use face masks in public places, and Bangladesh is no exception to this phenomenon. Little is known about the topic from the context of the country. In this study, we explored the factors that influence people for non-adherence to the public recommendation of using face masks in public places. We conducted a cross-sectional survey among 1,868 people across the country between March 2021 and December 2021. We used a semi-structured questionnaire to collect the data. The results indicate that the non-adherence to public recommendation for using face masks is associated with people's age, education, and location of residence; risk perception about the COVID-19; trust in messages from media and public authorities; barriers to effective communication, religious faith, and cost for buying face masks.

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1. INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, commonly known as coronavirus disease (COVID-19), first appeared in December 2019 in China, and quickly spread all over the world. The World Health Organization (WHO) declared the outbreak of the virus as a global public health emergency concern on January 30, 2020. Later, it declared the outbreak as pandemic on March 11, 2020. The SARS-CoV-2 pandemic is an unprecedented experience of the human being in the past 100 years. It has caused havoc in almost all aspects of human life such as health, economy, education, and law and order around the world. It has altered the very structure and function of human relations at the individual, social, community, national, and international levels. Lockdown, social distancing, hand washing, vaccination, and mask use in public places are some of the preventive measures recommended by scientists, experts, and political leaders around the world. On the other hand, vaccinating the whole population is a costly measure for low-and middle-income countries like Bangladesh. Moreover, maintaining physical distancing is an important measure to stop the spread of COVID-19. But it's almost impossible to keep a distance from others in crowded public places. So, health experts recommend the use of face masks in such settings. As the

countries reopen from stay-at-home orders, the WHO recommends masks for the public to reduce the spread of COVID-19 [1]. Moreover, it is a low-cost, convenient and effective method to control the outbreak [2], slow the spread of SARS-CoV-2 [3], and stop the COVID-19 virus from spreading [4]–[7]. The use of a mask plays a dual role in the prevention of the virus's negative impact—protecting an individual from getting infected by the virus and protecting others [5], [8]. According to a study conducted in 69 countries, there is a strong association between mask use and a reduction in infection, hospitalizations, and death rates [9].

The face mask is a simple fortification tool against COVID-19 with multiple meanings: social, cultural, political, religious, and medical [10]. Previous studies have shown numerous factors such as socio-behavioral [11], [12], demographic [13]–[15], psychological [16], [17], faith and religion [18], [19], contradictory communication and messaging, political and ideological [20], [21], difficulties in communication while using the mask [22], [23], the technicality of using the mask [24], [25] and trust in government and science [26] play an influential role in non-adherence of public recommendation of the masks using in public places. For example, some studies indicated that some socio-behavioural factors influence people's not adherence to public health advice such as mask use [12], [20]. The factors include a lack of public awareness of viral transmission [27], low level of risk perception, lack of trust in government and science, social pressure and prevalence of altruism, and perceived obstacles to following the advice or using the mask. Moreover, there are some individual characteristics [28] such as gender, education level, income level, religion, and political affiliation found to play important roles in this case [13], [29], [30]. Another study done in the United State shows that the tendency of using a mask by the female is higher compared to the male gender group [31]. People often avoid using face masks in public spaces due to difficulties in communicative actions while using the mask [23] such as difficulties in recognizing people while face to face interactions [22], [32]; difficulties in recognizing emotion expressed on the face [33]; problems in being heard or understood [24], [34]; and facing problem in using spectacles. Moreover, oppositional messages in the media and from people in positions of authority, and not the inclusion of mask use in early public health recommendations [35] have created confusion among the public. The confusion has led to lowering trust in government bodies, and ignorance of mask use. Some studies found that public trust in government plays an influential role in adherence to public health recommendations such as mask use [36], [37]. Due to the lack of trust, people often see the recommendations as too much government control over their lives for achieving hidden agendas. As they think that the recommendation of wearing a mask has been imposed upon them against their will, they tended not to use the mask in a public place. Masks are psychologically relevant because their use has become a matter of public order, fear, and doubt. Some studies found that some psychological factors influence an individual's use of a face mask in a public place [28]. The factors include an individual's perception of low risk, a tendency towards risky behaviour, feeling like their area is safe or has only a few infections, not agreeing that masks help prevent the spread of coronavirus, not wanting to show fear or vulnerability, behavioural freedom to be under threat [17], [38]. On the other hand, faith and religion are also found to be influential factors in not adhering to the public recommendation of mask use [18]. Many people do not believe that COVID-19 can cause serious illness. Rather they believe that it is only God who can cause illness in the human body, nothing else [19]. Meanwhile, some studies indicate that due to its very nature and structure the use of non-transparent face masks causes breathing harder, hampers communication, and compromises the immune system and psychological well-being [23].

As of March 24, 2022, the country has encountered 1.95 million confirmed cases of COVID-19, while the number of deaths was 29,118. Although the cases of COVID-19 and the death rates are decreasing gradually, the need for protective measures and the risk of affecting people by the virus remains high. Moreover, experts recommend wearing is a must despite vaccination. Empirical evidence shows that people in different parts of the country tend not using masks in public places. So, it is important to understand the factors that influence people to not adhere to the public recommendation of mask use in the country. Most of the previous studies have been conducted in the context of western countries, among a small sample of the profession and geographical location-specific population—physician nurses and community level. Very few studies explored the phenomenon among the nationwide population. Moreover, some of the studies only explored the scientific and technical aspects of masks, not the social and behavioural aspects of mask use. A study found that Bangladeshi participants who were females, Muslims, had education level till graduation, were employed, and had monthly income had high face mask adherence than Pakistan and India [39]. With the high density of population, Bangladesh is a country where maintaining social distancing is almost impossible, and taking other protection measures such as mass vaccination is beyond the capacity of the government. Well-articulated recommendations for mask use and strict adherence to the recommendation could be a way out for the county. But there is a lack of knowledge about public perception and reaction to mask use in the context of the country. To fill the gap, this study aimed to explore why people do not use the mask and do not adhere to public health advice to use the mask in a public place, and how to deal with people who refuse to wear a mask in developing countries like Bangladesh.

2. METHOD

2.1. Study design and participants

This study was a cross-sectional type descriptive research. A nation-wide survey was conducted to collect data from individuals living in different parts of the country between March 2021 and December 2021. Individuals with access to internet, and aged above 17 years part took part in the study. A web-based survey method, using Google Form, was used to collect data from the participants.

2.2. Data collection tools

We used a semi-structured questionnaire to collect information about socio-demography (age, gender, education, occupation, current residence, religion, marital status, and monthly income), primary knowledge, attitude, and practice of preventive measures of COVID-19, risk perception, sources of information, and factors affecting non-adherence to public recommendation to use mask. We measured the factors affecting non-adherence to public recommendation to use mask using a five-point Likert scale developed on the basis of literatures review. The scale consisted of 21 questions, and divided into seven factors—communication and messaging, trust in government, psychological factors, faith and religion, technicality of mask using, individual features and social factors. For example, communication and messaging factors were measured asking the respondents to rate statements such as “early public health recommendations did not include mask use” on the scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. Under the trust in government factors, there were three questions such as “wearing a mask has been imposed upon by the government”. Psychological factors were measured using questions such as “I think that my residential area is safe or has only a few infections”; technicality of mask use was measured using questions such as “using mask make it harder to breathe”; personal factors was measured on the basis of the questions such as “masks are only needed if someone has COVID-19”; and questions such as “mask-wearing is a sign of weakness and shame” indicated social factors that influence mask use in public place. At first, the questionnaire was pretested among 100 individuals. Then, it was finalized upon an opinion from a panel of experts in media and communication, public health and statistics.

2.3. Procedures

A survey link was distributed through email, WhatsApp messaging tool, and Facebook messenger among potential 3,200 participants. The link was distributed targeting people living in rural, urban areas and the capital city Dhaka. We adopted a multistage random sampling method in deciding participants of the study. Primarily, we selected eight divisions, the administrative structure of Bangladesh. The divisions are divided into 64 districts. We collected data from two districts from each division at random. From the randomly selected 16 districts, we aimed to collect 3,200 responses—200 responses from each district. During the study period, some 2,385 individuals filled up the questionnaire (the response rate was 74.53%). After removing incomplete and inconsistent responses, 1,868 responses were used for the final analysis. At the beginning of the questionnaire, the aims, objectives, importance, rights and benefits of taking part in the study, the right to withdraw at any stage of the survey, the maximum duration of the survey, and declarations of anonymity and confidentiality of the survey were mentioned. The participants could fill up the questionnaire only after giving informed consent to take part in the study. No identifiable data or any clinical evidence were collected. For each participant, the survey lasted for an average of 10 minutes.

2.4. Data analysis

We used descriptive statistics to calculate mean and standard deviation for quantitative variables, while frequencies and percentages for categorical variables. We applied contingency table and Chi-square (χ^2) test to find out the association between categorical variables. We also performed bivariate logistic regression to determine the key factors of using face masks in public places during the COVID-19 pandemic, from which the odds ratio corresponding to each explanatory variable was presented with its 95% confidence interval (CI) and p-value. The p-value was considered significant at level 0.05. Statistical Package for the Social Sciences (SPSS, version 26.0) and R (Version 4.2.1) was used to analyze the data. The dependent variable was the use of face masks in a public place, while independent variables, age, gender, education, occupation, trust in the newspaper, television social media platforms, health professionals, trust in friends and relative and trust in government officials.

3. RESULTS

Table 1 presents information about demographic features of the participants of the study. A total of 1,868 individuals from rural and urban areas took part in this study. Of them, 68.6% were male and 31.4% were female. As shown in the Table 1, the majority of the participants were aged between 19 and 29 years, and >50 years. Of the participants, 35.2% were from urban areas of upazila level towns, 26.0% rural areas or

village, 22.5% from city corporations/division level cities. Among the participants 23.8% higher secondary level of education, 22.3% had graduate level, and 20.3% had post graduate level education. Almost two third (66.5%) of the participants had have income of more than 20,000. Details are shown in the Table 1.

Table 1. Socio-demographic characteristics of the participants (N=1,868)

Variables		Frequency (%)
Gender	Male	1,281 (68.6)
	Female	587 (31.4)
Age	<19	23 (1.2)
	19-29	533 (28.5)
	30-39	284 (15.2)
	40-49	493 (26.4)
	>50	535 (28.6)
Residence	Rural/Village	486 (26.0)
	Urban/Upazila	658 (35.2)
	City corporation/Division	420 (22.5)
Education	Capital	304 (16.3)
	No education	150 (8.0)
	Primary	234 (12.5)
	Up to class 10	243 (13.0)
	Up to class 12	444 (23.8)
	Graduate	417 (22.3)
Occupation	Post graduate	380 (20.3)
	Housewife	290 (15.5)
	Agriculture	174 (9.3)
	Business	310 (16.6)
	Service	549 (29.4)
	Student	380 (20.3)
	Retired	70 (3.7)
	Others	95 (5.1)
Income	<20,000	1,242 (66.5)
	20,000-40,000	376 (20.1)
	>40,000	250 (13.4)
Religion	Islam	1,501 (80.4)
	Hindu	307 (16.4)
	Christian	19 (1.0)
	Buddhist	10 (0.5)
	Atheist	31 (1.7)
Opinion about COVID-19	Dangerous	400 (56.2)
	Like the common flue and fever	216 (30.3)
	Not dangerous	96 (13.5)

Table 2 presents information about people's sources of information about COVID-19, and their trust in the sources. People get information about COVID-19 from multiple sources—printed newspapers, television, radio, online news portals, social media platforms, friends and family members, healthcare professionals, and government officials. Our findings indicate that there is a significant association (p -value <0.05) between the use of face masks and the level of trust in the information available in the newspapers, social media platforms, healthcare professionals such as doctors, friend and relatives, and government officials. Healthcare professionals were found to be most trusted source of information as 65.0% participants informed that they had strong trust in doctors regarding the source of COVID-19 information. While, the level of trust in government officials was the lowest as only 26.6% participants had strong trust in the official when it come a source of information about COVID 19 issues. Details are shown in the Table 2.

Data in Table 3 (see in Appendix) presents information about influencing factors for not using a mask in public spaces during the COVID-19 pandemic. The results show that multiple factors affect public decision of not using face masks. The factors are: not inclusion of message on face mask use in the government's public health recommendations at the onset of the pandemic (p -value 0.000); presentation of conflicting messages different mass media outlets (p -value 0.018); the communication of confusing messages by government officials (p -value 0.000); a perception that the government was imposing to use mask (p -value 0.000); a feeling that government was trying to control public lives by forcing to use masks (p -value 0.000); a perception that COVID-19 was not too risky as portrayed by the government and media (p -value 0.000); a perception that the residential area was safe or had only a few infections (p -value 0.000); an thinking that the use of face mask may indicate vulnerability to COVID-19 (p -value 0.000); a belief that that it is only Allah/God who can save from COVID-19, not mask use (p -value 0.000); an experience of using a face mask made breathing harder (p -value 0.000); difficulties in interpersonal interaction while using a face mask (p -value 0.000); and creating difficulties to recognize known people (p -value 0.000). Some 63.7%

participants reported that the government's early recommendations did not include the use of masks in public places, meanwhile, mass media presented different messages regarding mask-wearing, which confused the people (p -value <0.05). On the other hand, 47.3% of the participants perceived the recommendation to use a mask as an imposition from the government. Also, 39.6% of the participants felt that the government was trying to control their lives by forcing them of wearing a mask. Another influencing factor was that the participants felt that the face mask use made breathing harder. On the other hand, 52.6% of the participants experienced difficulties in communicating with others while using a mask. Details are shown the Table 3 (see in Appendix).

Table 2. Sources of COVID-19 information and trust in the sources (N=1,868)

	Variables	Do not use a mask	Use mask	Total	Chi-square	p-value
Trust in the newspaper as a source of information about COVID-19	Strong	254 (35.7)	520 (45.0)	774 (41.4)	16.501	0.000
	Neutral	349 (49.0)	471 (40.7)	820 (43.9)		
	Weak	109 (15.3)	165 (14.3)	274 (14.7)		
Trust in television as a source of information about COVID-19	Strong	334 (46.9)	587 (50.8)	921 (49.3)	3.713	0.156
	Neutral	280 (39.3)	404 (34.9)	684 (36.6)		
	Weak	98 (13.8)	165 (14.3)	263 (14.1)		
Trust in social media as a source of information about COVID-19	Strong	186 (26.1)	372 (32.2)	558 (29.9)	11.204	0.004
	Neutral	362 (50.8)	501 (43.3)	863 (46.2)		
	Weak	164 (23.0)	283 (24.5)	447 (23.9)		
Trust in doctors as a source of information about COVID-19	Strong	423 (59.4)	791 (68.4)	1214 (65.0)	19.862	0.000
	Neutral	201 (28.2)	280 (24.2)	481 (25.7)		
	Weak	88 (12.4)	85 (7.4)	173 (9.3)		
Trust in friends and relatives as a source of information about COVID-19	Strong	298 (41.9)	346 (29.9)	644 (34.5)	28.371	0.000
	Neutral	280 (39.3)	526 (45.5)	806 (43.1)		
	Weak	134 (18.8)	284 (24.6)	418 (22.4)		
Trust in government officials as a source of information about COVID-19	Strong	154 (21.6)	342 (29.6)	496 (26.6)	20.505	0.000
	Neutral	285 (40.0)	470 (40.7)	755 (40.4)		
	Weak	273 (38.3)	344 (29.8)	617 (33.0)		

Data in Table 4 presents information about association between people's demographic features and their decision of using or not using masks in public places. The results indicate that the decision of using or not using face make in public place is strongly associated (p -value >0.01) with an individual's demographic features such as age, location of residence, level of education, and occupations. Details are shown in Table 4.

Table 4. Distribution of demographic determinants of using a mask or not using a mask

Variables	Use mask (N=1156)	Not use mask (N=772)	p-value
Gender			
Male	491 (69.0)	790 (68.3)	0.410
Female	221 (31.0)	366 (31.7)	
Age			
<19	3 (0.4%)	20 (1.7)	0.000
19-29	153 (21.5)	380 (32.9)	
30-39	109 (15.3)	175 (15.1)	
40-49	208 (29.2)	285 (24.7)	
>50	239 (33.6)	296 (25.6)	
Location of residence			
Rural/Village	249 (35.0)	237 (20.5)	0.000
Urban/Upazila	254 (35.7)	404 (34.9)	
City corporation/Division	150 (21.1)	270 (23.4)	
Capital	59 (8.3)	245 (21.2)	
Education			
No education	92 (12.9)	58 (5.0)	0.000
Primary	151 (21.2)	83 (7.2)	
Up to class 10	135 (19.0)	108 (9.3)	
Up to class 12	191 (26.8)	253 (21.9)	
Graduate	98 (13.8)	319 (29.6)	
Postgraduate	45 (6.3)	335 (29.0)	
Occupation			
Housewife	171 (24.0)	119 (10.3)	0.000
Agriculture	102 (14.3)	72 (6.2)	
Business	159 (22.3)	151 (13.1)	
Service	127 (17.8)	422 (36.5)	
Student	88 (12.4)	292 (25.3)	
Retired	23 (3.2)	47 (4.1)	
Others	42 (5.9)	53 (4.6)	

Table 5 presents results of logistic regression that was performed to determine the multivariate association between demography, knowledge about COVID-19, social factors, and the probability that the persons using masks or not in public places. Age group, 30-39 (OR: 24.1%, 95% CI: 0.070-0.830, $p<0.05$), 40-49 (OR: 20.6%, 95% CI: 0.06-0.701, $p<0.05$) and >50 (OR: 18.6%, 95% CI: 0.055-0.633, $p<0.05$) were comparative significantly higher than age group less than 18 years. Urban (OR: 1.67, 95% CI: 1.318-2.118, $p<0.05$), city corporation (OR: 24.1%, 95% CI: 0.070-0.830, $p<0.05$) and capital (OR: 4.363, 95% CI: 3.120-6.101, $p<0.05$) were significantly more using mask than the people who lives in rural area. On the other hand, people having education up to class 12 (OR: 2.101, 95% CI: 1.143-3.068, $p<0.05$), graduate level (OR: 5.163, 95% CI: 3.464-7.695, $p<0.05$) and postgraduate (OR: 11.808, 95% CI: 7.510-18.567, $p<0.05$) were more likely to using mask than the no educated participants and which is statistically significant (Figure 1). The persons who were in service (OR: 2.633, 95% CI: 1.678-4.133, $p<0.05$), students (OR: 2.630, 95% CI: 1.644-4.207, $p<0.05$) and retired (OR: 1.619, 95% CI: 0.852-3.079, $p<0.05$) were more likely to use mask than the participants in others occupation and there is a significant relationship among them (Figure 1).

Table 5. Factors associated with using masks

Variables	Using mask OR (95% CI)	Sig.
Gender (ref: Male)		
Female	1.029 (0.842-1.259)	0.779
Age category (ref: <18)		
19-29	0.373 (0.109-1.272)	0.115
30-39	0.241 (0.070-0.830)	0.024
40-49	0.206 (0.06-0.701)	0.011
>50	0.186 (0.055-0.633)	0.007
Residence of participants (ref: Rural/Village)		
Urban/Upazila	1.671 (1.318-2.118)	0.000
City corporation/Division	1.891 (1.447-2.471)	0.000
Capital	4.363 (3.120-6.101)	0.000
Education (ref: No education)		
Primary	0.872 (0.571-1.332)	0.526
Up to class 10	1.269 (0.838-1.921)	0.260
Up to class 12	2.101 (1.143-3.068)	0.000
Graduate	5.163 (3.464-7.695)	0.000
Postgraduate	11.808 (7.510-18.567)	0.000
Occupation (ref: Others)		
Housewife	0.551 (0.345-0.880)	0.013
Agriculture	0.559 (0.338-0.927)	0.024
Business	0.753 (0.474-1.195)	0.228
Service	2.633 (1.678-4.133)	0.000
Student	2.630 (1.644 – 4.207)	0.000
Retired	1.619 (0.852-3.079)	0.141

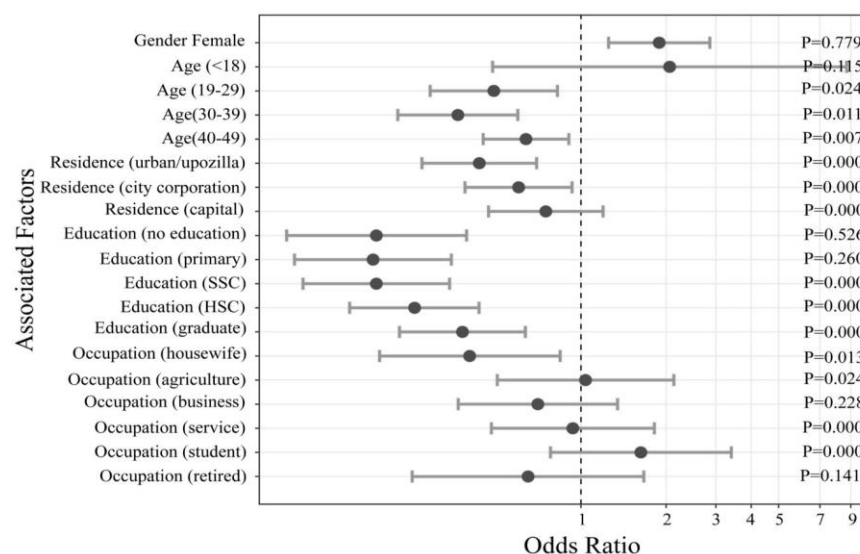


Figure 1. Forest plot showing odds ratio (OR) and p-value of the associated factors with factor using a mask

4. DISCUSSION

To reduce the spread of COVID-19 and its associated risks, the use of face masks in public places is one of the most effective, easy and cost-effective measure recommended by scientists and policy makers around the world. In this study, we conducted a nationwide survey to understand that factors that influence non-adherence to the public recommendation of mask use in Bangladesh. We found that at least seven factors contributed to non-adherence to the public recommendations of mask use in the country. The factors include socio-demographic features of the people, trust in information sources, appropriate communication and messaging, trust in government, psychological factors, faith and religion, technical difficulties of using mask, individual features and socio-economic factors. This finding expands previous works by adding evidence on factors associated with not adhering to public health advice for mask use during COVID-19 from the context of a developing country like Bangladesh.

From the overall results, it is evident there is a strong association between the use of face masks and the level of trust in the information available in the newspapers, social media platforms, healthcare professionals such as doctors, friend and relatives, and government officials. Healthcare professionals were found to be most trusted source of information. While, the government officials found to be least trusted source of information about the issues related COVID-19. From the results, it can be argued that the level of trust might have influenced people's decision of not adherence to public recommendation to use face mask. In such cases, policy makers must put emphasis on engaging more health experts and health professional in disseminating recommendations instead of government officials.

The results of the study show that more than half of the participants perceive COVID-19 as a very dangerous virus with life threats. This perception might be associated with exposure to media information, and social networks in their real life. From our results, it is evident that the use of masks in a public place is associated with the source of information about COVID-19 and the level of trust in that source, which is consistent with the findings of several previous studies [40], [41]. People who have strong trust in newspapers, television, and healthcare professionals such as doctors, close friends, and government officials tend to use more face masks compared to people with weak trust. So, it can be argued that the communication of public health recommendations in any emergency like COVID-19 must be done through trustworthy channels, and public officials must gain the trust of the people of the country, otherwise, people would not adhere to the recommendation of mask use in public places.

We also found that the decision of using or not using face masks in public places is strongly associated with an individual's demographic features such as age, location of residence, level of education, and occupations, which is similar to the findings of some previous studies [42], [43]. The results show that the tendency of not using face masks is higher among people who are aged between 19 to 29 years compared to their tendency of using face mask in public places. Similar tendency was found among service holders and students. The tendency of using face masks is higher among the people with higher level of education compared to lower level of education, which is consistent with the findings of another study [44]. From our results, it can be argued that this tendency might be associated ability to understand the messages from media and public officials. So, to increase adherence to public advice for using a mask in a public place, the messages should be crafted in a way so that people with low education can understand it. Consistent with the findings of previous studies [45], our results show that people of older ages tend to use more masks compared to younger people. This tendency might be due to their risk perception, comorbidity, and other health issues. Generally, older people are concerned about their health issues and often suffer from various health people. So, the communication of health messages during an emergency like the COVID-19 pandemic should emphasize raising awareness among young people. Consistent with the findings of a study in China [46], our findings indicate that people living in rural areas are less likely to adhere to public advice to use a face mask in a public place. The results indicate that the tendency of people living in city corporation areas at the division level or the capital city of using a face mask in a public place is lower compared to people living in villages or Upazila town level in Bangladesh. This tendency might be associated with the higher availability of medical facilities, their control over life, and lower risk perception of COVID-19.

Overall, the non-adherence of public recommendation to use face masks in public places is multi-faceted. Consistent with the findings of a study in Singapore [47], our results show that people tended not to adhere to the recommendations as they perceived the public messages about COVID-19 from government officials were confusing. Moreover, they perceived the recommendation as an imposition from the government, and the government was trying to control their lives by forcing them to use it. The results also indicate that a lack of trust in the source of COVID-19 messages is a strong contributing factor to not using a mask in a public place as the majority of the participants believed that COVID-19 was not too risky as portrayed by the government and media, and they were living in an area which was safe and had only a few infections. On the other hand, some personality traits prevent people from adhering to the use of masks in public places. A majority of the participants of the study reported that they do not use a mask in a public

place as they do not want to show that they were vulnerable to COVID-19. Religious faith was found to be an influential factor in not using a mask as most of the participants believed that it was only Allah/God who can save them from COVID-19, not mask use. We found that issues related to effective communication also play an important role in not using a face mask in a public place. People often avoid using the mask as they felt that it was difficult to breathe, and harder to recognize others and convey messages. Many of the participants also believed that buying surgical masks has created an economic burden on them.

Our results support some previous studies. For example, a study on European countries [48] argued that people often do not take proper measures to reduce risk when they are exposed to inaccurate, vague, or contradictory information from both official and unofficial sources during a crisis. Other studies [49], [50], found that the perception of risk about the virus is influenced by the sources of the information such as friends and family, trust in the government, health professionals, and personal and collective efficacy. Although our study reveals that more than half of the participants perceive the various as dangerous with life risk, the tendency to use protective measures in a public place is relatively low in the country, which is a paradox.

Our findings are unique from previous studies in many ways. While the previous studies investigated the phenomenon from a relatively narrower perspective—risk perception, knowledge, and behaviour, communication barrier, the technicality of mask use, and social, psychological, and religious dimensions. This study tried to understand the phenomenon from a comprehensive perspective by combining all possible aspects. Moreover, it generates insight into communicating health and risk issues from a developing country like Bangladesh. The results of the study would be of interest to public health experts, public health communication experts, policymakers, and researchers in communication and social science.

However, our study has some limitations. First, this research was conducted among a limited number of populations in limited geographical areas of a country. So, insights generated in this study may not reflect the reality of non-adherence to public health recommendations in the whole country and among people of all levels. Moreover, we did not use a higher level of statistical analysis. So, our interpretation of the data may not reflect the accurate correlations and causation among the phenomenon.

5. CONCLUSION

Communicating recommendations in public health emergencies is a complex and multidimensional process. Effective and appropriate communication plays an influential role in gaining trust in government and public health authorities, and the extent to which people follow public health recommendations in emergencies and uncertain situations. We found that adherence and non-adherence to public health recommendations are strongly associated with selecting appropriate communication channels; designing complete and clear messages; communicating clear recommendations; and gaining public trust in government and public health authorities. Poor trust in communication from authorities may lead to non-adherence of public health recommendations in any emergency like COVID-19. So, public health recommendations should be communicated through trustworthy channels, and public officials must gain the trust of the people of the country, otherwise, people would not adhere to the recommendation of mask use.

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APPENDIX

Table 3. Influencing factors for not using a mask in the COVID-19 situation

		Variables	Do not use a mask	Use mask	Total	Chi- square	p-value
Communication and message factors	Early public health recommendations by the government didn't include mask use	Disagree	415 (58.3)	774 (67.0)	1,189 (63.7)	24.989	0.000
		Neutral	200 (28.1)	210 (18.2)	410 (21.9)		
		Agree	97 (13.6)	172 (14.9)	269 (14.4)		
	Mass media presented different messages regarding mask use	Disagree	171 (24.0)	274 (23.7)	445 (23.8)	8.006	0.018
		Neutral	143 (20.1)	176 (15.2)	319 (17.1)		
		Agree	398 (55.9)	706 (61.1)	1,104 (59.1)		
Trust in Government factors	Messages from government officials created confusion	Disagree	159 (22.3)	391 (33.8)	550 (29.4)	31.337	0.000
		Neutral	121 (17.0)	197 (17.0)	318 (17.0)		
		Agree	432 (60.7)	568 (49.1)	1,000 (53.5)		
	The government forced the decision of using face masks	Disagree	186 (26.1)	459 (39.7)	645 (34.5)	36.721	0.000
		Neutral	145 (20.4)	194 (16.8)	339 (18.1)		
		Agree	381 (53.5)	503 (43.5)	884 (47.3)		
	Feel that the government is trying to control life by forcing to use a mask	Disagree	270 (37.9)	596 (51.6)	866 (46.4)	37.581	0.000
		Neutral	130 (18.3)	132 (11.4)	262 (14.0)		
		Agree	312 (43.8)	428 (37.0)	740 (39.6)		
	Think that COVID-19 is not too risky as portrayed by the government and media	Disagree	350 (49.2)	941 (81.4)	1,291 (69.1)	225.272	0.000
		Neutral	106 (14.9)	95 (8.2)	201 (10.8)		
		Agree	256 (36.0)	120 (10.4)	376 (20.1)		
Psychological factors	Think that my residential area is safe or has only a few infections	Disagree	211 (29.6)	607 (52.5)	818 (43.8)	99.740	0.000
		Neutral	115 (16.2)	156 (13.5)	271 (14.5)		
		Agree	386 (54.2)	393 (34.0)	779 (41.7)		
	Think that masks may help to prevent the spread of the COVID-19 virus	Disagree	142 (19.9)	103 (8.9)	245 (13.1)	161.732	0.000
		Neutral	171 (24.0)	93 (8.0)	264 (14.1)		
		Agree	399 (56.0)	960 (83.0)	1,359 (72.8)		
	Do not use a mask as it may indicate vulnerability to COVID-19	Disagree	357 (50.1)	650 (56.2)	1,007 (53.9)	6.924	0.031
		Neutral	129 (18.1)	194 (16.8)	323 (17.3)		
		Agree	226 (31.7)	312 (27.0)	538 (28.8)		
	Regarding mask use, it is my life, it is a choice	Disagree	293 (41.2)	896 (77.5)	1,189 (63.7)	254.632	0.000
		Neutral	115 (16.2)	88 (7.6)	203 (10.9)		
		Agree	304 (42.7)	172 (14.9)	476 (25.5)		
Faith and religion	Believe that it is only Allah/God who can save from COVID-19, not mask use	Disagree	145 (20.4)	587 (50.8)	732 (39.2)	256.050	0.000
		Neutral	92 (12.9)	223 (19.3)	315 (16.9)		
		Agree	475 (66.7)	346 (29.9)	821 (44.0)		
Technicality of mask use	Using a mask makes it harder to breathe	Disagree	78 (11.0)	394 (34.1)	472 (25.3)	154.236	0.000
		Neutral	76 (10.7)	155 (13.4)	231 (12.4)		
		Agree	558 (78.4)	607 (52.5)	1,165 (62.4)		
	Using mask make it harder to communicate with others	Disagree	116 (16.3)	560 (48.4)	676 (36.2)	224.853	0.000
		Neutral	80 (11.2)	129 (11.2)	209 (11.2)		
		Agree	516 (72.5)	467 (40.4)	983 (52.6)		
	Using mask make it harder to recognize known people	Disagree	75 (10.5)	249 (21.5)	324 (17.3)	41.429	0.000
		Neutral	92 (12.9)	155 (13.4)	247 (13.2)		
		Agree	545 (76.5)	752 (65.1)	1,297 (69.4)		
	Using a mask makes it harder to use a spectacle	Disagree	93 (13.1)	176 (15.2)	269 (14.4)	35.439	0.000
		Neutral	233 (32.7)	235 (20.3)	468 (25.1)		
		Agree	386 (54.2)	745 (64.4)	1,131 (60.5)		
Personal factors	Think that masks are only needed if someone has COVID-19	Disagree	300 (42.1)	917 (79.3)	1,217 (65.1)	268.304	0.000
		Neutral	80 (11.2)	52 (4.5)	132 (7.1)		
		Agree	332 (46.6)	187 (16.2)	519 (27.8)		
	Think that masks are not necessary for the general public health safety	Disagree	356 (50.0)	1,009 (87.3)	1,365 (73.1)	318.563	0.000
		Neutral	98 (13.8)	62 (5.4)	160 (8.6)		
		Agree	258 (36.2)	85 (7.4)	343 (18.4)		
	Do not use a mask as suffering from an illness that makes it difficult to use it	Disagree	303 (42.6)	833 (72.1)	1,136 (60.8)	196.311	0.000
	Using a face mask may indicate weakness, and it is a matter of shame	Disagree	370 (52.0)	1,012 (87.5)	1,382 (74.0)	292.544	0.000
		Neutral	105 (14.7)	61 (5.3)	166 (8.9)		
		Agree	237 (33.3)	83 (7.2)	320 (17.1)		
Social and economic factors	Buying a surgical mask has created an economic burden	Disagree	90 (12.6)	338 (29.2)	428 (22.9)	92.175	0.000
		Neutral	230 (32.3)	396 (34.3)	626 (33.5)		
		Agree	392 (55.1)	422 (36.5)	814 (43.6)		