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A Comparative Study on the knowledge and attitude of COVID-19 among Urban and Rural populations of Bangladesh

Bangladeş'in kentsel ve kırsal nüfusları arasında COVID-19 üzerine karşılaştırmalı bir çalışma

Md. Kamal Hossain Ripon[a], Noor Muhammad Khan[b], A E M Adnan Khan[a], Rana Ahmed[a], Safia Afrin[a], Md. Abu Sayeed[a], Md. Mizanur Rahman Moghal[a]

[a] Mawlana Bhashani Science and Technology University, Department of Pharmacy Santosh, Tangail, Bangladesh.
[b] Mawlana Bhashani Science and Technology University, Department of Statistics, Tangail, Bangladesh.

ABSTRACT

Aim: This study is aimed to identify the awareness and behavioral perspective on COVID-19 between urban and rural people of Bangladesh during the period of outbreak. **Methods:** A community-based cross-sectional descriptive study was conducted in 30 districts of Bangladesh, where 322 participants from urban and 312 from rural area. Participants were selected through convenience sampling. **Results:** Rural people are found to be much more inter connected to receive information from neighbor. Regarding the incubation periods and the general symptoms, knowledge differs significantly from urban to rural. Even their precautionary and transmission knowledge is found to associate in most of the cases. During this outbreak, urban people significantly increase their religious habits and also believe that there will some major change of life after outbreak. **Conclusion:** The descriptive study reflected that health education program needed to aware about COVID-19 in both urban and rural in Bangladesh that helps in formulating and executing communication and outbreak management.

Keywords: COVID-19, outbreak, SARS-CoV-2, awareness, Bangladesh

ÖZ

Amaç: Bu çalışma, salgın döneminde Bangladeş'in kentsel ve kırsal kesiminde yaşayan insanlar arasında COVID-19 hakkında farkındalık ve davranışsal bakış açısını belirlemeyi amaçlamaktadır. **Yöntem:** Bangladeş'in 30 ilçesinde, kentsel alanlardan 322 ve kırsal alandan 312 katılımcının bulunduğu topluluk temelli kesitsel bir çalışma yürütüldü. Katılımcılar uygun örnekleme yoluyla seçildi. **Bulgular:** Kırsal kesimde yaşayan insanların komşularından bilgi almak için birbirleriyle çok daha bağlantılı oldukları görülmüştür. Kuluçka dönemleri ve genel semptomlarla ilgili olarak, bilgi kentselden kırsana önemli ölçüde farklılık göstermektedir. İhtiyati ve aktarım bilgilerinin bile çoğu durumda ilişkilendirildiği görülmektedir. Bu salgın sırasında, şehirli insanlar dini alışkanlıklarını önemli ölçüde artırıyor ve ayrıca salgının ardından bazı büyük yaşam değişiklikleri olacağına inanıyor. **Sonuç:** Çalışma, sağlık eğitimi programının Bangladeş'te hem kentsel hem de kırsalda iletişim ve salgın yönetiminin formüle edilmesine ve yürütülmesine yardımcı olan COVID-19 hakkında bilgi sahibi olması gerektiğini gösterdi.

Anahtar kelimeler: COVID-19, salgın, SARS-CoV-2, farkındalık, Bangladeş

Introduction

In 1960, corona virus was first appeared and until 2002, the world considered it as a nonfatal and relatively simple virus. The outbreak of 2002-2003 in China later spread many other countries including United States of America with high mortality rates. After massive fatality, Centers for Disease Control and Prevention and World Health Organization (WHO) declared a state of emergency in 2004.[1,3] An unknown case of pneumonia was reported which clinical symptoms were similar to usual viral pneumonia in Hubei province, China, in December 2019.[4] The pneumonia was named by the World Health Organization (WHO) and the International Committee on Taxonomy of Viruses as "COVID-19" and 'Severe Acute Respiratory Syndrome Coronavirus2' (SARS-CoV-2) respectively.[5] It is now a pandemic and an international emergency of public health for all over the countries, should step forward to prevent COVID-19 spread called by World Health Organization (WHO) on January 30.[6, 7] The COVID-19 was confirmed to spread in Bangladesh on March 2020. The first three known cases were reported by the country's Institute of Epidemiology, Disease Control and Research (IEDCR) on 8 March 2020.[8] Within 4 May, there are a total of 10143 confirmed cases, 182 deaths and

Case Fatality Rate (1.79%) in the country.[9] Bangladesh first imposed nationwide lockdown from March 26 and extended several times for the consequence the Ministry of Public Administration again issued a notification on 4 May, 2020 to extend the general holiday and close all schools, colleges and universities until 14 May, followed by a weekend 15-16 May except all emergency services to resist the spreading of COVID-19.[10] Government of Bangladesh bound to withdraw lockdown due to the economic distress related to suicidal incidences around that time.[11,12] Within the last two weeks of march, 2021, the number of infection and death is tremendously increases and high-risk zone gave a hyper jump from 10 to 38 which is more than half country's 64 districts, according to IEDCR data.[13] From June, 2021, both the number of infection and death dramatically increases and government reimposed a strict lockdown nationwide from July 1-13 and ease the lockdown from July 15-22 for the biggest festival Eid al-Adha and again resume the strict lockdown from July 23 to next two weeks.[14,16] Overall, 1,994,752 infected cases and 19.779 deaths reported in Bangladesh[17] and globally more than 196,002,202 people was infected and 4,193,301 confirm death by

COVID 19 on 28th July, 2021.[18] During the period of outbreaks, general people need instant information, a group of population is experience fear, discrimination and stigmatization required special care.[19,20] Furthermore, after the outbreak of severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and Ebola, it was recommended that the knowledge and attitudes is connected with the intensity of panic emotion regarding the infectious diseases which make further difficulties to prevent the spread of the diseases.[21,26] While the illness and death are significant, general public or specific communities suffer from fear which make them delay asking help and remain undetected that is very hazardous for controlling transmission during the outbreak of infectious diseases.[25] After the outbreak, the prevalence of post-traumatic stress disorder (PTSD) and major depression of general people increased up to 41% and 7% respectively.[27] At this critical situation, it is vital need to understand the public's awareness of COVID-19 in Bangladesh to facilitate the management of outbreak. In this study, we investigate the knowledge and attitude towards COVID-19 of both urban and rural residents of Bangladesh during this rise period of outbreak to provide the legislators actual field-based data and to support them in the management of this pandemic.

Methods
To capture the attitude toward COVID-19 among the people of Bangladesh, a community based cross sectional descriptive study was conducted over a short period (March 2020 to April 2020) during the rise period of outbreak of COVID-19. We have collected the data from 30 convenient districts out of 64 districts. Due to lockdown situation in Bangladesh, it was very hard to collect the data from all the districts. Total 634 participants are encountered in the survey, where we tried to make equal representation of urban and rural people. Respondents were also selected from each district based on their availability to us. In a ward, we have used convenience sampling, a non-probability sampling technique, in selecting the respondents from the people of Bangladesh. This sampling technique is also known as accidental sampling in many literatures. Convenience sampling involves the sample being drawn from that part of the population that is close to hand. Though it increases the selection bias, it was the only efficient way of collecting data from the people of Bangladesh in lockdown days.

The questionnaire was developed based on the knowledge about COVID-19. We designed the questionnaire into several sections including Transmission, Sign & Symptoms, Precautions, Treatment, Mental Health, and socio-demographic status of the respondents. Each part is a mirror image of the knowledge about COVID-19 except first and the last part which contains the demographic characteristics and mental health of the participants respectively. In the second section, the questions were designed to reflect the basic knowledge about COVID-19 among rural and urban populations. Knowledge about the transmission is most important part to resist the COVID-19, which was measured through the questions in section three. Similarly, questions in section four reflect the knowledge regarding sign and symptoms among the mentioned populations. Another most important part in the knowledge of precaution was measured through the questions in the fifth section and a prime factor of contamination rate among them. Questions in the sixth section were designed regarding the treatment option against COVID-19. Finally, our study observed the mental health of the participants during and after the pandemic through the questions of the last section. Chi square test is used in this research to examine the differences between categorical variables. The study was approved by the Ethical Review Committee, Mawlana Bhashani Science and Technology University. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Results
Table 1 summarizes the participants according to their demographic characteristics. There is almost equal representation of urban and rural people in our data set, where female participants are found to slightly more convenient than male.

Table 1: Population according to demographic characteristics

Demographic Characteristics		Frequency	Percentage
Place of Residence	Urban	322	51
	Rural	312	49
Gender	Female	353	56
	Male	281	44
Age	13-19	165	26
	20-29	189	30
	30-39	88	14
	40-19	92	15
	50-59	66	10
	60 and above	34	5
Education	< Primary	40	6
	SSC	154	24
	HSC	129	20
	Undergraduate	168	26
	Graduate	102	16
	Post Graduate	41	6
Family Status	Lower Class	107	17
	Middle-Class	382	60
	Upper Middle-Class	120	19
	Upper Class	25	4
Participant Group	Survivor	0	0
	Community Member	629	99
	Health Worker	5	1
Division	BARISAL	0	0
	CHITTAGONG	25	4
	DHAKA	350	55
	KHULNA	12	2
	MYMENSINGH	106	17
	RAJSHAHI	82	13
	RANGPUR	45	7
	SYLHET	14	2

We have collected the data from those people who have age 13 or above. Among them, 94% are found to be educated as they have completed their secondary school certificate. Majority of our respondents are from the middle-class family or higher which ensures that they have the sufficient resources to gather knowledge about COVID-19. Unfortunately, we didn't find any survivor respondents.

Figure 1 represents the distribution of urban and rural people who have heard about the corona virus, have known about what is corona virus and finally whether they are familiar with the causes of COVID-19 before attending the survey study or not.

People in urban and rural bear similar general information about COVID-19 on their mind except the cases, where urban people are more knowledgeable about the causes of this novel virus than the rural people. Figure 2 represents that how the participants from the urban and rural, known about the information of COVID-19. Mass media is key source of knowledge about COVID-19 in both urban and rural area of Bangladesh, where Friends are the secondary source of information there. Compared to urban, people in rural get much information about this virus from their neighbors.

Table 2 reveals that people in urban and rural area show similar correct response rate

Table 2: Distribution of correct response rate and knowledge source about COVID-19 in urban and rural.

		Rural (percentage)	Urban (percentage)	p value
Correct Response Rate	Question 1[1]	94.55	95.34	1.000
	Question 2[2]	53.69	58.23	0.614
	Question 3[3]	65.71	87.58	0.000
Knowledge Source	Friends	17.00	15.00	0.106
	Mass media	67.00	75.00	
	Neighbor	14.00	5.00	
	Other	2.00	5.00	

1. *Heard about corona before attending the survey?*
2. *What is the novel corona (COVID-19)?*
3. *What are the causes of COVID-19?*

in question one and two. This result is found to be statistically insignificant. Urban people have larger correct response rate in question three compared to rural people, where they are asked about the causes of COVID-19. This result is found to be statistically significant. P value of chi square test presented in table 2 also shows that source of knowledge of the people in urban area doesn't differ significantly with the source of knowledge of the people in rural area in Bangladesh. Table 3 summarize the participants according to their knowledge on transmission. We have conducted Chi Square test to check the association between the knowledge of urban and rural people in Bangladesh. COVID-19 spreads from person-to-person through several mediums. Knowledge of urban and rural people about these mediums are associated at 5% level of significance except the sneezing and the surface they have recently touched. Their knowledge on food including refrigerated or frozen food,

whether COVID-19 spread through food or not, also associated. This result is found to be statistically significant at 1% level of significance. The opinion of warm weather can stop the outbreak of spreading of this virus is now talk of the town. We have found a significant association between the knowledge of urban and rural people about this opinion. Some people are agreed about the opinion of transmission from pet or another animal, where some others are disagreed. Urban and rural people's knowledge about this transmission is found to be significant. Most of the people in urban area believes that someone can spread the virus without being sick, where most of the rural people bear reverse belief on their mind. This result is also found to be statistically significant at 1% level of significance.

Table 4 summarize participants according to their knowledge on sign & symptoms. We have found significant association between
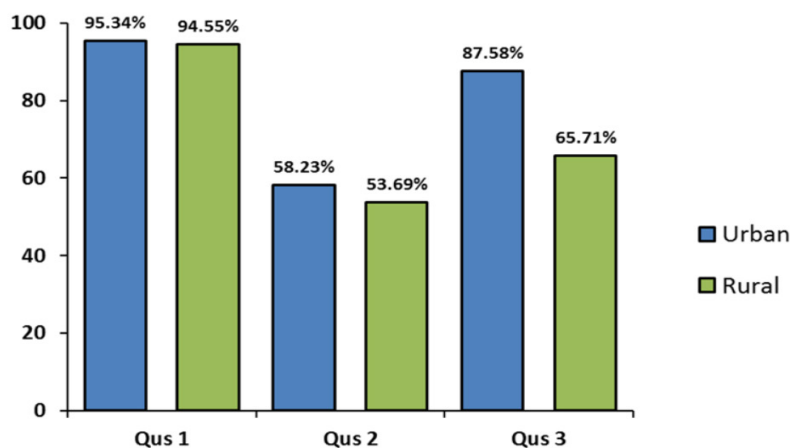

Figure 1: Distribution of urban and rural people according their general knowledge about COVID-19.

Table 3: Population according to their knowledge on transmission

Knowledge of transmission	Urban (n=322)		Rural (n=312)		P value
	Number	%	Number	%	
Spread from person-to-person					
Coughing	256	79.5	220	70.5	0.012
Sneezing	233	72.4	205	65.7	0.084
Direct contact with a sick person	249	77.3	193	61.9	0.000
The surfaces they have recently touched	177	55.0	153	49.0	0.157
Not known	15	4.7	5	1.6	0.048
Spread through food including refrigerated or frozen food					
Yes	82	25.5	110	35.3	
No	132	41.0	90	28.8	<0.001
There is no evidence support	108	33.5	112	35.9	
Warm weather can stop the outbreak					
Yes	63	19.6	127	40.7	
No	120	37.3	80	25.6	<0.001
Yet not confirm	139	43.2	105	33.7	
Survive in the surface of the opened things					
Few hours	167	51.9	88	28.2	
Few days	75	23.3	97	31.1	<0.001
Not known	80	24.8	127	40.7	
Transmission from pet or another animal					
Agree	221	68.6	152	48.7	<0.001
Disagree	101	31.4	160	51.3	
Someone spread the virus without being sick					
Yes	220	68.3	122	39.1	<0.001
No	102	31.7	190	60.9	

Table 4: Population according to their knowledge on sign & symptoms

| Knowledge of Sign& Symptoms	Urban (n=322)		Rural (n=312)		P value
	Number	%	Number	%	
Incubation period of corona virus is					
1-2 days	8	2.5	5	1.6	
2-14 days	293	91.0	243	77.9	<0.001
One month	1	0.3	4	1.3	
Not known	20	6.2	60	19.2	
The general symptoms are					
Sore throat	243	75.5	212	67.9	0.044
Runny nose	212	65.8	170	54.5	0.004
Nasal congestion	170	52.8	117	37.5	<0.001
Shortness of breath	251	78.0	175	56.1	<0.001
Difficulty breathing	252	78.3	201	64.4	<0.001
Fatigue	125	38.8	88	28.2	0.006
Diarrhea	107	33.2	141	45.2	0.002
The symptoms are generally looking like pneumonia					
Yes	298	92.5	280	89.7	0.269
No	24	7.5	32	10.3	
Higher risk for COVID-19					
Children	35	10.9	90	28.8	<0.001
Adult	29	9.0	40	12.8	0.157
Older persons	111	34.5	108	34.6	0.990
People aged 65 years and older	189	58.7	130	41.7	<0.001
Who have serious underlying medical conditions	218	67.7	104	33.3	<0.001
I have symptoms of COVID-19					
Self-isolate	301	93.5	274	87.8	0.020
Do not visit a hospital, physician's office, lab or healthcare facility without consulting	124	38.5	98	31.4	0.073
Mixed with mass people	3	0.9	1	0.3	0.638
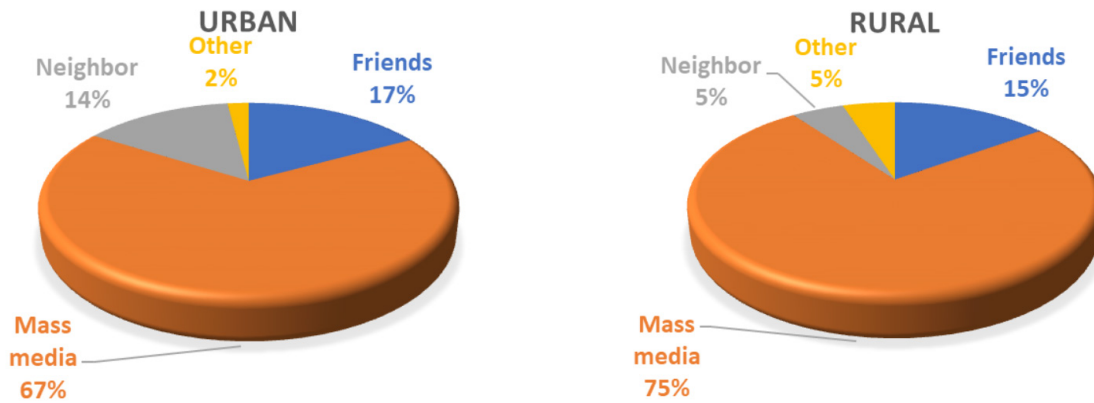
Figure 2: Distribution of knowledge source about COVID-19 in urban and rural.

the knowledge of urban and rural people on sign & symptoms of COVID-19 except few scenarios. The knowledge about the symptoms that they are generally looking like pneumonia insignificantly varies from urban to rural people. We haven't found any significant association between the knowledge of urban and rural people on Adults and Older Persons, that they are at higher risk of COVID-19. A small portion of people in both areas, more specifically 0.93% and 0.32%, believes that they could mixed with mass people even if they are the positive cases of COVID-19.

Table 5 summarize the participants according to their knowledge on precautions. The knowledge of urban and rural people on precautions of COVID-19 is found to be significant in most of the cases. Knowledge on the differences between 'isolation and quarantine' are not associated in urban and rural area, where majority of them are known with this. All the people in both areas are agreed that if someone

recently returned home from abroad should be self-isolate for 14 days after the date of return and monitor for symptoms. Table 6 summarize the participants according to their knowledge on treatment. A large portion of the people in both areas know that there is no suitable treatment or vaccine or anti-biotic for COVID-19. Their knowledge on suitable treatment is significantly associated, where knowledge on vaccine and anti-biotic aren't. Patients of several diseases are much more vulnerable from this virus. Knowledge about hypertension, asthma and COPD, psychiatric, cardiac, kidney failure, and other patients except diabetic patients are significantly associated in both areas.

Table 7 summarize the participants according to effect on mental health. All the questions in this section are Likert questions except the last one. We have conducted the Cochran–Armitage test to check the association. This association test can be performed on a contingency table with one ordered nominal variable and one non-ordered

Table 6: Population according to their knowledge on treatment

Knowledge of Treatment	Urban (n=322)		Rural (n=312)		P value
	Number	%	Number	%	
There is any suitable treatment-	20	6.2	40	12.8	0.007
Is there any vaccine for COVID-19?	7	2.2	12	3.8	0.316
Antibiotics has no role in Corona virus	242	75.2	254	81.4	0.070
Patients are much more vulnerable-					
Hypertension	166	51.6	105	33.7	0.000
Asthma and COPD	265	82.3	230	73.7	0.012
Psychiatric patients	101	31.4	51	16.3	0.000
Diabetes patients	202	62.7	180	57.7	0.224
Cardiac patient	192	59.6	140	44.9	<0.001
Kidney failure	164	50.9	92	29.5	<0.001
Other	77	23.9	51	16.3	0.023

Table 5: Population according to their knowledge on precautions

Knowledge of Precautions	Urban (n=322)		Rural (n=312)		P value
	No	%	No	%	
You protect yourself and your family-					
Stay home	294	91.3	270	86.5	0.073
Avoid social and other outings	247	76.7	201	64.4	0.001
Wash your hands often and well	243	75.5	210	67.3	0.025
Avoid touching your face, nose, or mouth with unwashed hands	247	76.7	207	66.3	<0.001
Avoid close contact with people who are sick	241	74.8	155	49.7	<0.001
I should wear a medical mask-					
If I am sick	286	88.8	203	65.1	<0.001
If I am healthy	80	24.8	109	34.9	
Clean my hands after coughing or sneezing-					
Wash with soap and warm water, for at least 20 seconds	303	94.1	260	83.3	<0.001
Wash with alcohol-based hand rub or sanitizer	224	69.6	167	53.5	<0.001
Clean with tap water is good enough	16	5.0	6	1.9	0.06
Difference between 'isolation and quarantine'					
I know	217	67.4	189	60.6	0.088
I don't know	105	32.6	123	39.4	
Someone recently returned home from abroad should					
Visit father-in-law house.	0	0.0	0	0.0	
Immediately getting married	0	0.0	0	0.0	
Roaming village or city with girlfriend or wife	0	0.0	0	0.0	
Self-isolate for 14 days after the date of return and monitor for symptoms	322	100.0	312	100.0	
Social distancing					
Working from home instead of the office	159	49.4	110	35.3	<0.001
Closing schools and switching to online classes	174	54.0	88	28.2	<0.001
Postponing large meetings.	143	44.4	102	32.7	0.003
6 feet away from other people (COVID-19)	279	86.6	224	71.8	<0.001

Table 7: Population according to effect on Mental Health

Effects on Mental Health	Urban (n=322)		Rural (n=312)		P value
	Number	%	Number	%	
I am likely to get Coronavirus					
Strongly disagree	117	36.3	106	34.0	0.003
Disagree	119	37.0	78	25.0	
Agree	71	22.0	116	37.2	
Strongly agree	15	4.7	12	3.8	
Worried about getting the Coronavirus					
Strongly disagree	29	9.0	21	6.7	0.010
Disagree	43	13.4	33	10.6	
Agree	160	49.7	131	42.0	
Strongly agree	90	28.0	127	40.7	
Belief regarding the infected people-					
Will die	32	9.9	29	9.3	0.333
No comments	162	50.3	176	56.4	
Will recover	128	39.8	107	34.3	
Religious habits change during outbreak					
Increased	203	63.0	146	46.8	<0.001
No change	88	27.3	131	42.0	
Decreased	31	9.6	35	11.2	
Life will be changed in a major way after outbreak					
Agree	285	88.5	259	83.0	0.062
Disagree	37	11.5	53	17.0	
Everyone should follow the government instructions					
Strongly disagree	2	0.6	20	6.4	<0.001
Disagree	3	0.9	6	1.9	
Agree	42	13.0	66	21.2	
Strongly agree	275	85.4	220	70.5	
Feeling Comfort going to outside of home					
Yes	20	6.2	42	13.5	0.003
No	302	93.8	270	86.5	

nominal variable. The effect of COVID-19 on the mental health of urban and rural people in Bangladesh is found to be significantly associated from many dimensions.

Discussion

Our study shows that urban people are more knowledgeable than rural people regarding causes of COVID-19. This is because, the people in urban and rural area in Bangladesh doesn't have the similar access to gather knowledge on various issues. Though mass media is the largest source of knowing about COVID-19 here, rural people are mostly dependent on the broadcast media and their neighbors. However, urban people are found to be more aware about this virus than the rural one. They are mostly dependent on internet, especially social sites, scientific journals, broadcast media etc. These areas are the sources of knowledge about COVID-19 to them. Urban and rural residents of the China, where the first COVID-19 patient was reported, have the moderate level of COVID-19 knowledge and they show a positive attitude toward the disease.[30] The urban respondents of Pakistan, a nearby country of Bangladesh, had

higher knowledge about COVID-19 disease as compared to rural respondents. Their hygienic behavior was better than rural respondents.[31] However, our data also represents that rural people significantly carry lack of knowledge about transmission as well as precautions. On the other hand, both urban and rural people know that there is no treatment of this disease but rural people are not taking much precautions, our thinking this may be due to the lack knowledge and awareness. Choi and Kim also described in their studies infection-control knowledge directly related with attitudes and practice.[21] Ajzen and Fishbein revealed a significant correlation among knowledge, attitudes and practice.[28] Other studies also support this finding where they mentioned lack of awareness in Anhui province of China.[29] Impact of this pandemic on the global health and mental health is reported in recent studies.[28] Our study also shows that both urban and rural people are worried about getting the corona virus and believe that after outbreak life will be changed in a major way. Some researchers tried to identify the root cause of panic in the community, where they reported that the Muslim communities in the rural area facing the COVID-19 Pandemic attempts to find refuge from the plague and hope for survival.[32] However urban people significantly increased their religious habit during this outbreak. So far, we know, previously population-based studies regarding COVID-19 either field based or online based were conducted in the city area only. In our country, internet is not easily accessible, especially in rural area. Moreover, the people in the rural area are not habituated regarding this on-line survey. Face to face survey is highly recommended here to find out the exact scenario.

In contrast we conducted our study in both urban and rural areas following heath guidelines strictly and also covered a good number of participants in both areas. On the other hand, the limitation of our study, we can't include survivor in this study because survivor wasn't available at that time. Our recommendation to conduct similar studies in different developing countries in the world for more evidence for the management of pandemic because rural people is less advanced in different perspectives than urban people. COVID-19 is now a pandemic and the situation

are like time bomb as no medical treatment is too much effective and no proper vaccine yet discovered. Bangladesh become a highest worse condition regarding this infectious disease in the world due to overpopulated and lack of awareness. In this circumstance only people's awareness in Bangladesh can help to protect us. This cross-sectional study was carried out to identify the awareness and behavioral perspective on COVID-19 between urban and rural people. Awareness regarding COVID-19 was unsatisfactory in rural residents as compared to urban. Based on the results of our study, we can conclude that improvement of COVID-19 knowledge, attitudes and promotion of awareness among residents by effective health education programs is needed especial care needed in rural areas. Our belief this survey will provide valuable information to the legislators regarding the perceptions of urban and rural population for the management of pandemic.

Acknowledgements

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