Knowledge, Attitude and Practice on COVID-19 among Rural People in a Selected Area of Bangladesh, A Community based Cross Sectional Study

*Mahjabin A,[1] Ali KM,[2] Islam MT,[3] Tasneem T,[4] Zihan MM,[5] Roy S,[6] Ferdous J[7]

Abstract

Background: The current novel Corona virus pandemic Covid-19, was first reported in December 2019 in Wuhan, China and has spread globally causing startling loss of life, stalling the global economy disrupting social life which needs to be controlled immediately.

Objectives: The study was conducted with an aim to assess the knowledge, attitude and practice among the rural population regarding COVID-19.

Methods: This was a cross-sectional study carried out in different villages of Manikganj during the period of October, 2020 to March, 2021 by the Department of Community Medicine, Monno Medical College, Manikganj.

Results: The study revealed that out of 400 respondents majority 159(39.8%) belonged to the age group (31-45) years, most of the respondents 209(52.3%) were male, majority 120(30.0%) completed primary level of education, most of the respondents 131(32.8%) were housewives and majority 195(48.8%) having monthly family income <5000 taka. In this study it was found that almost all the respondents 396(99.0%) heard about COVID-19, three-fourths 329(82.3%) had knowledge about the seriousness of the disease. Among the respondents, majority 279(69.8%) considered fever, one-fifth 83(20.8%) difficulty in breathing as common symptoms of COVID-19. About three-fourths 297(74.6%) of the respondents mentioned respiratory droplets as a mode of transmission of COVID-19 and most of the respondents 297(75.8%) agreed wearing mask, two-thirds 251(64%) frequent hand washing and one-third 131(33.4%) social distancing as methods of prevention. About half of the respondents 217(54.5%) considered all people and old people 208(52.3%) were at high risk and majority 310(77.9%) heard about COVID-19 from Television. About one-third of the respondents 133(34.4%) had fear about COVID-19 and majority 316 (79.0%) avoided going to the crowed areas. About two-thirds of the respondents 315(78.8%) used mask in public places, 354(88.5%) practiced hand washing and 316(79.0%) maintained social distancing. Male had higher level of knowledge than female about the general concept of COVID-19 but the difference was not statistically significant (χ^2, $p>0.05$). Respondents with higher level of education had higher level of knowledge about the general concept of COVID-19 and the difference was statistically significant (χ^2, $p<0.05$).

Conclusion: Rural people still have a lack of proper knowledge, attitude and practice towards COVID-19.

[Shaheed Syed Nazrul Islam Med Col J 2021, Jul; 6 (2):186-197]

Keywords: KAP, COVID-19, Rural people, Manikganj, Bangladesh.

1. **Dr. Afsana Mahjabin, Assistant Professor, Community Medicine, Monno Medical College, Manikganj. afsana.aqsa@gmail.com*
2. *Dr. Khondoker Mohammad Ali, Associate Professor, Community Medicine, Monno Medical College, Manikganj*
3. *Dr. Mohammad Tariqul Islam, Associate Professor, Physical Medicine & Rehabilitation, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka*
4. *Dr. Tamanna Tasneem, Assistant Commissioner (Land) and Executive Magistrate, Kumerkhali, Kushtia*
5. *Dr. M. A. Muhaimin Al Zihan, Assistant Commissioner (Land) and Executive Magistrate, Kushtia Sadar Kushtia*
6. *Dr. Senjuti Roy Assistant Registrar, Department of Pediatrics, Dhaka Community Medical College and Hospital, Dhaka*
7. *Dr. Jannatul Ferdous, Lt Colonel, Classified Child Specialist, Pediatric Cardiologist, CMH, Sylhet*

**For correspondence*

Introduction

COVID-19 is a highly transmissible multi-organ viral disease caused by SARS-CoV-2, a new corona virus. The most common symptoms of infection are fever, dry cough, fatigue, headache, loss of smell, and shortness of breath.[1] The disease is currently the largest public health issue worldwide, having reached, since March 11, 2020, the status of a global pandemic.[2] It was unknown before the outbreak began in Wuhan, China, in December 2019.[3,4] Overall, the disease mortality rate was reported to be 2.2% in China.[5] The virus rapidly spread to all provinces in China, as well as a number of countries across the globe, and was declared a Public Health Emergency of International Concern by the Director General of the World Health Organization on 30 January 2020.[4] On 11 March 2020, the WHO declared COVID-19 a pandemic.[2,6] The first confirmed cases were recorded in Bangladesh on 8 March 2020 and continued to spread.[7] However, regarding prevention of the spread of this disease, non-clinical interventions based on primary health care practice have been suggested by the World Health Organization (WHO) considering existing scientific evidences.[8] Public behavior is also crucial in combating the pandemic influenced by people's knowledge of preventing this infectious disease. Recent scientific evidences have demonstrated that the adequate knowledge, attitude and appropriate practice (KAP) of the interventions are associated with reduction of morbidity and mortality and ultimately total control over COVID-19.[9] Thus, coordination of whole-society in an appropriate way for generating knowledge and maintaining proper attitude and practice is essential to counter the pandemic.

At present a large number of people are infected and a considerable number of people are dying daily due to COVID-19 which can be prevented or controlled by proper human behaviors and attitudes towards the virus. Thus, there is a growing concern about the importance of health behaviors and attitudes towards the virus, and studies that address KAP in Bangladesh can contribute to prevention of further spread. Densely populated and overcrowded countries such as Bangladesh have the potential to become disease hotspots with active transmission of agents to large communities. Under such an alarming situation, little is known about the status regarding COVID- 19 KAP among Bangladeshi rural people. An understanding of the public's awareness related to COVID-19 signs and symptoms, mode of transmission and prevention/control strategies is urgently needed for proper management of the disease. Therefore, this study aimed to investigate knowledge, attitude and practice on COVID-19 among rural people of Bangladesh.

Methods

This was a descriptive type of cross-sectional study which was conducted among the rural people aged 18 to 60 years in four different villages named as Nabagram, Noyakandi, Baruil, Dholai under Nabagram union of Manikganj Sadar Upazilla, Manikganj in the dept. of Community Medicine, Monno Medical College during the period of 1st October, 2020 to 31st March, 2021. The villages with near about 50,000 population, having two primary schools, one madrasa, two high schools and with about 70% literacy rate, are located 70 kilometers away from Dhaka city, 10 kilometers away from Manikganj town and 7 kilometers away from Monno Medical College. The ethical clearance was approved by ethics review committee of Monno Medical College. The participants were included in the study on the basis of some inclusion criteria which were age between 16 to 60 years, both male and female adults and who will provide informed written consent. Psychologically abnormal

person and seriously ill patients were excluded.

Sample size was 400 and was determined by following scientific method, $n=z^2$ pq/d2. Sampling technique was convenient sampling technique. The data were collected through face to face interview by pre-tested semi-structured questionnaire. The questionnaire was designed to find out the socio-demographic characteristics of the respondents such as age, sex, education, occupation etc. as well as knowledge of the people about COVID-19 such as it's types, prevention, social distancing, quarantine etc. The other information such as knowledge on sign-symptoms: fever, cough, sneezing, difficulty in breathing etc.; sources of knowledge: health workers, television, newspaper etc.; knowledge on transmission: by air (droplet) by contact, by animal flesh etc.; opinion of the respondents about high risk group: old people, people with co-morbidity (DM, COPD, HTN), pregnant women etc.; knowledge about prevention: wearing mask, frequent hand washing, social distancing etc.; attitudes of respondents towards COVID-19: fear of COVID-19, afraid of going crowded area, afraid of using public transport etc.; COVID friendly practice of people: using of mask, hand washing, social distancing etc. were also collected from the respondents. Then the data were checked and verified for any omission or in consistency. Finally data were analyzed by SPSS version 23 to find out necessary frequencies and percentages.

Results

A total number of 400 people were recruited. Majority 159(39.8%) of the respondents belonged to the age group (31-45) years, most of the respondents 209(52.3%) were male & majority 120(30.0%) completed primary level. Most of the respondents 131(32.8%) were housewives and monthly family income of most of the respondents 195(48.8%) was <5000 taka (Table I).

In this study it was revealed that 396(99.0%) respondents heard about COVID-19, 329(82.3%) had knowledge about the seriousness of the disease, 375(93.8%) accepted that the disease was preventable, 257(65.1%) had proper idea about quarantine & 43(10.8%) had the right knowledge on social distancing (Figure 1).

Among the respondents, majority 279(69.8%) considered fever, 334(83.5%) cough, sneezing, 149(37.3%) sore throat and 83(20.8%) difficulty in breathing as common symptoms of COVID-19 (Table II).

About three-fourths 297(74.6%) of the respondents mentioned respiratory droplets, 205(51.5%) contact and 6(1.5%) mosquitoes bite as modes of transmission of COVID-19 (Table II).

Most of the respondents 297(75.8%) agreed wearing mask, 251(64%) frequent hand washing and 131(33.4%) social distancing as methods of prevention (Table II).

About half of the respondents 217(54.5%) considered all people, 208(52.3%) old people, 193(48.5%) people with co-morbidity and 79(19.8%) pregnant women were at high risk (Figure 3).

Table 1: Socio- demographic characteristics of the respondents, n=400232

Socio-demographic characteristics	Frequency	Percentage
Age (years)		
16-30	102	25.4
31-45	159	39.8
46-60	139	34.8
Mean±SD= 40.43±11.014 (Minimum=19, Maximum=60)		
Sex		
Male	209	52.3
Female	191	47.8
Education		
Illiterate	91	22.8
Primary	120	30.0
Secondary & SSC	106	26.5
HSC & above	83	20.8
Occupation		
Agricultural worker	114	28.6
Day laborer	38	9.5
Business	47	11.8
Service	70	17.5
Housewife	131	32.8
Religion		
Islam	302	75.5
Hinduism	98	24.5
Family Income (Taka)		
<5000 Taka	195	48.8
5001-10000 taka	131	32.8
10001-15000	26	6.5
> 15000 taka	48	12.0
Mean±SD= 7977.50±7225.390 (Minimum=1000, Maximum=50000)		

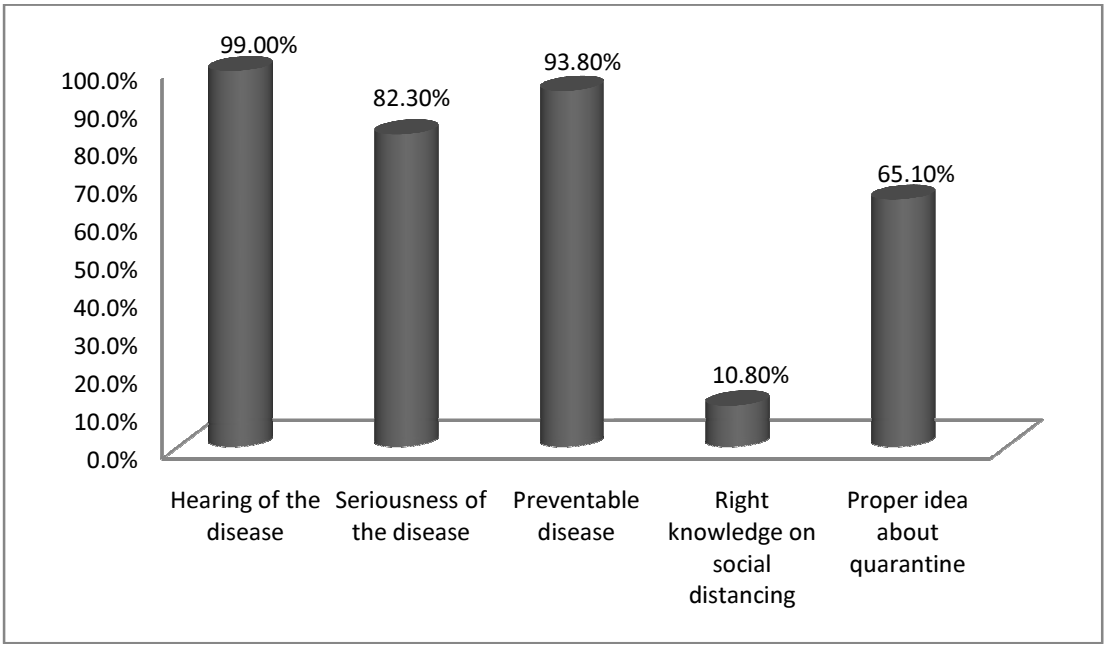


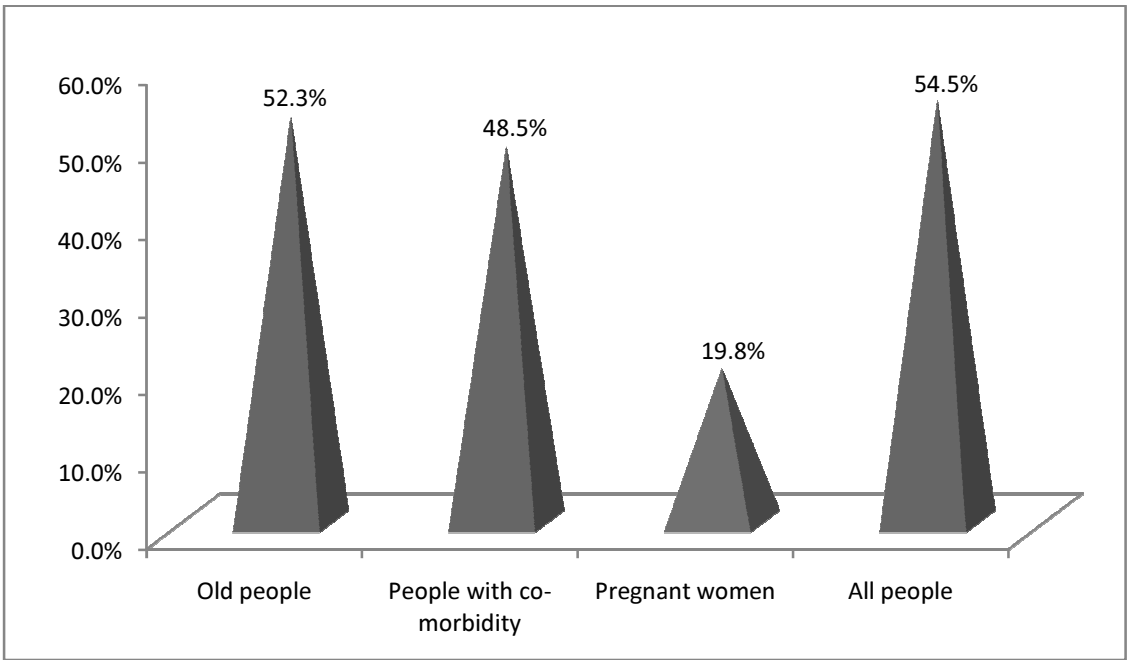
Figure 1. General concept of COVID-19, n=400

Table II: Knowledge on sign-symptoms, mode of transmission, prevention of Covid-19

Sign-symptoms	Frequency	Percent
Fever	279	69.8
Cough, sneezing	334	83.5
Sore throat	149	37.3
Difficulty in breathing	83	20.8
Loss of smell	27	6.8
Loss of taste	32	8.0
Body ache	24	6.0
Others	3	0.8
Mode of transmission		
By respiratory droplet	205	51.5
By contact	297	74.6
By animal flesh	10	2.5
By Mosquitoes bite	6	1.5
Others	5	1.3
Methods of prevention		
Wearing mask	297	75.8
Frequent hand washing	251	64.0
Social distancing	131	33.4
Isolation	156	39.8
Quarantine	8	2.0
Vaccination	35	8.9
Healthy life style	10	2.6
Others	5	1.3

Multiple response analysis

Figure II: Opinion of the people about high risk group of COVID-19, n=400



Most of the respondents 310(77.9%) heard about COVID-19 from Television followed by 168(42.2%) from health workers, 118(29.6%) from Newspaper as well as 50(12.6%) from facebook (Figure 3).

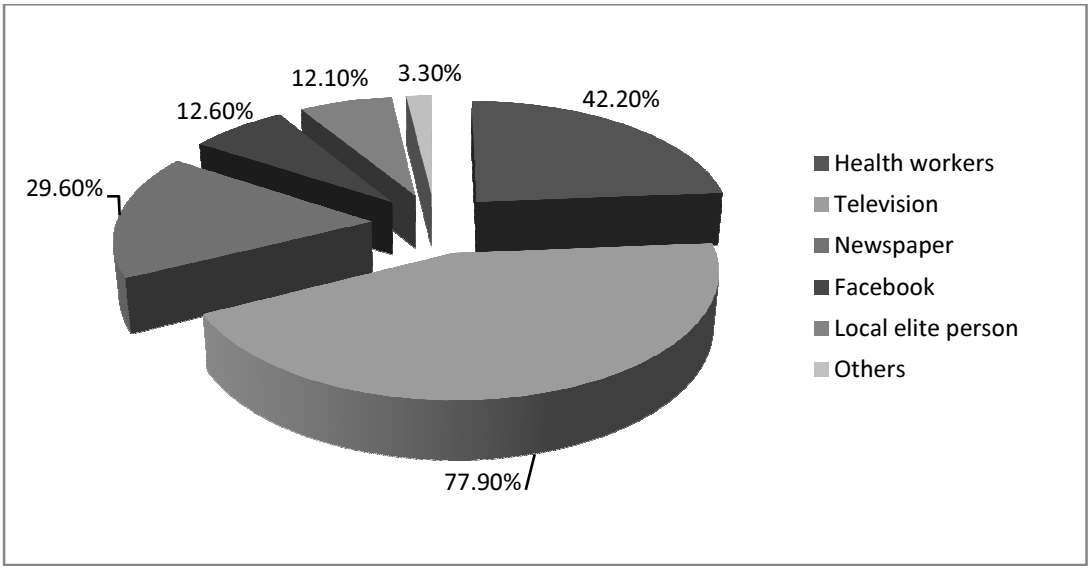


Figure 3. Sources of knowledge about COVID-19, n=400

About one-third of the respondents 133(34.4%) had fear about COVID-19, 160(41.3%) were afraid of going to the crowded area as well as 26(6.7%) scared about using public transport (Table III).

Table III: Attitudes of respondents towards COVID-19, n=400

Attitudes	Number	Percentage
Fear about COVID-19	133	34.4
Afraid of going to the crowded area	160	41.3
Afraid of using public transport	26	6.7
Willing to go for COVID-19 test if suffering from cough, sneezing and fever	185	47.8
Willing to take treatment if diagnosed as COVID-19 patient	59	15.2

Multiple response analysis

Majority 316 (79.0%) of the respondents avoided going to the crowed areas, 315(78.8%) used mask in public places, 354(88.5%) practiced hand washing and 316(79.0%) maintained social distancing (Table IV).

Table IV: COVID friendly practice of people, n=400

Practices	Number	Percentage
Using of mask in public places	315	78.8
Hand washing	354	88.5
Social distancing	316	79.0
Avoiding going to the crowded areas	126	31.5
Use of tissue, handkerchief, hand or arm during coughing or sneezing	311	77.8

Multiple response analysis

In relation to general concept of COVID-19, male 207(52.3%) were higher than female 189(47.7%) about the hearing of the disease but it was not statistically significant ($p>0.05$) as well as male 170(51.8%) had higher level of knowledge than female 158(48.2%) about the seriousness of the disease but the difference was not statistically significant ($p>0.05$) (Table V).

Table V: Gender of respondents with the general concept of COVID-19

General concept of COVID-19		Sex of the patients			Significance
		Male F (%)	Female F (%)	Total f(%)	
Hearing of the disease	Yes	207(52.3)	189(47.7)	396(100.0)	χ^2= .000 (Yates Correc-tion) df =1 p=1.000
	No	2(50.0)	2(50.0)	4(100.0)	
	Total	209(52.3)	191(47.8)	400(100.0)	
Seriousness of the disease	Yes	170(51.8)	158(48.2)	328(100.0)	χ^2= 0.053 (Yates Correc-tion) df =1 p=0.795
	No	39(54.2)	33(45.8)	72(100.0)	
	Total	209(52.3)	191(47.8)	400(100.0)	

In connection with general concept of COVID-19, respondents with Secondary & SSC level as well as HSC & above had higher level of knowledge than Illiterate and Primary level about quarantine and social distancing and the difference was statistically significant ($p<0.05$) (Table VI).

Table IV: Educational status of respondents with the general concept of COVID-19

General concept of COVID-19	Educational Status					Significance
	Illiterate F (%)	Primary F (%)	Secondary & SSC F (%)	HSC & above f (%)	Total f(%)	
Proper idea about quarantine	53(20.6)	63(24.5)	72(28.0)	69(26.8)	257(100.0)	χ^2= 22.150 df =3 p=0.000
Right knowledge on social distancing	6(14.0)	4(9.3)	12(27.9)	21(48.8)	43(100.0)	χ^2= 50.348 df =9 p=0.000

Discussion

The novel COVID-19 virus has resulted in an unprecedented and complex crisis within the short time since it was first detected in December 2019. Considering the novelty of the disease and the uncertainties associated with its pathogenesis, it is crucial to actively engage the population for managing the rapid spread[10]. To date, there has been limited published data on knowledge, attitude, and practice (KAP) patterns toward COVID 19 among the rural people. Understanding KAP among rural people is valuable considering the various amount of exposure risks that exists in a community due to their free movement to the crowed area like hat-bazar.

This descriptive type of cross-sectional study has been conducted among 400 rural people aged (16-60) years in four different villages under Nabagram union of Manikganj Sadar Upazilla, Manikganj with a view to assessing the knowledge, attitude and practice among the rural population regarding COVID-19. In the present study, majority (39.8%) of the respondents belong to the age group (31-45) years, most of the respondents (52.3%) are

male & majority (30.0%) complete primary level. Most of the respondents (32.8%) are housewives and monthly family income of most of the respondents (48.8%) is <5000 taka.

It has been revealed that 99.0% respondents have heard about COVID-19, 82.3% have knowledge about the seriousness of the disease, 93.8% have accepted that the disease is preventable, 65.1% have proper idea about quarantine & 10.8% have the right knowledge on social distancing. A study that has been conducted by Rahman SM in Bangladesh reflects that 70.0% respondents have knowledge on social distancing which is inconsistent with the result of this study.[11] This may be due to unequal access to information of COVID-19 in the rural area.

Among the respondents, majority 279(69.8%) considered fever, 334(83.5%) cough, sneezing, 149(37.3%) sore throat and 83(20.8%) difficulty in breathing as common symptoms of COVID-19. A similar study that has been conducted in Pakistan by Mahmood S et al shows that 83.9% of the people recognize fever as a primary symptom. This finding is almost consistent with the result of this study.[12] The reason behind this may be global equal dissemination of knowledge about COVID-19.

About three-fourths 297(74.6%) of the respondents mentioned respiratory droplets, 205(51.5%) contact and 6(1.5%) mosquitoes bite as modes of transmission of COVID-19. A study which has been conducted in Pakistan by Ahmed N et al on COVID-19 reveals that respiratory droplets (87%) is considered as the most common route of transmission which is almost consistent with the result of this study.[13] This may be due to equal level of acceptance of knowledge by the people. Another study that has been conducted in Bangladesh by Sultana MS et al reflects that 9.14% people believe that COVID-19 can transmit via mosquito which is almost consistent with the result of this study.[14]

Most of the respondents 297(75.8%) agreed wearing mask, 251(64%) frequent hand washing and 131(33.4%) social distancing as methods of prevention. About half of the respondents 217(54.5%) considered all people, 208(52.3%) old people, 193(48.5%) people with co-morbidity and 79(19.8%) pregnant women are at high risk. A study which has been conducted in in Pakistan by Mahmood S et al shows that 59% of the participants think everyone is susceptible which is consistent with the opinion of this study.[12]

Most of the respondents (77.9%) have heard about COVID-19 from Television followed by 42.2% from health workers, 29.6% from Newspaper as well as 12.6% from facebook. A study that has been conducted by Christy JS et al at South India reveals that the main source of information regarding COVID-19 is Internet social media (66.3%) followed by TV (17.4%) which is inconsistent with the result of this study.[10] The reason may be less use of modern technology by the rural people.

About one-third of the respondents 34.4% have fear about COVID-19, 41.3% are afraid of going to the crowded area as well as 26(6.7%) scare about using public transport. A similar study that has been conducted by Fatmi Z et al in Pakistan shows that two-thirds of the population had high levels of fear about COVID-19. This finding is inconsistent with the result of this study.[15] This is due to the fact that rural people give more emphasis on livelihood rather than a disease.

In this study majority (79.0%) of the respondents avoid going to the crowed areas, 78.8% use mask in public places, 88.5% practice hand washing and 79.0% maintain

social distancing. A similar study which has been conducted in in Pakistan by Mahmood S et al shows that 39.9% of the participants have reported that they wash their hands every hour and 56.9% participants are using a surgical mask which is inconsistent with the opinion of this study[12]. This may be due to improper dissemination of health education.

A study that has been conducted by Zhong BL et al in China shows that (98.0%) wore masks when going out in recent days. This finding is almost consistent with the result of this study.[16] Another similar study that has been conducted by Hossain MA et al in Bangladesh reveals that 83.7% of respondents have reported wearing a mask in public which is consistent and 75.4% of respondents have reported staying away from crowded places which is inconsistent with the result of this study[17]. Another study has been conducted by Rahman SM in Bangladesh reflected that 51.8% respondents practice hand washing and 50.0% respondents maintain social distancing which is inconsistent with the result of this study.[18] The reason for this may be unequal access of information regarding COVID-19.

In relation to general concept of COVID-19, male (52.3%) are higher than female (47.7%) about the hearing of the disease but it is not statistically significant ($p>0.05$) as well as male (51.8%) have higher level of knowledge than female (48.2%) about the seriousness of the disease but the difference is not statistically significant ($p>0.05$). A study which has been conducted by Lee M et al in South Korea shows that females ($p < 0.05$) are more likely to have accurate information about COVID-19 which is inconsistent with the result of this study.[19] This may be due to international variation of responsiveness towards disease and educational background. In Bangladesh, male (*literacy rate* is 76.67%) are more educated than female (*literacy rate* is 71.18%).[20] So, female have lower level of knowledge than male.

In connection with general concept of COVID-19, respondents with Secondary & SSC level as well as HSC & above have higher level of knowledge than Illiterate and Primary level about quarantine and social distancing and the difference was statistically significant (χ^2, $p<0.05$). A study which has been conducted by Lee M et al in South Korea shows that higher level of education demonstrate higher level of knowledge about COVID-19 ($p < 0.05$) which is consistent with the result of this study.[19]

This is a small study conducted in a small area selected conveniently. The sample size was also small for which it may not reflect the real picture of Bangladesh.

Conclusion

In this study it has been found that almost all the respondents have heard about COVID-19, three-fourths have knowledge about the seriousness of the disease. Among the respondents, majority consider fever, one-fifth difficulty in breathing as common symptoms of COVID-19. About three-fourths of the respondents have mentioned respiratory droplets as a mode of transmission of COVID-19. Majority agreed wearing mask, two-thirds frequent hand washing and one-third social distancing as methods of prevention. About one-third of the respondents have fear about COVID-19 and majority avoid going to the crowed areas. About two-thirds of the respondents use mask in public places, majority practice hand washing and maintain social distancing. Male and respondents with higher education have higher level of knowledge about the general concept of COVID-19. As the global threat of COVID-19 continues to emerge, it is critical to improve the knowledge, attitude and practice of the rural people. Educational

interventions are urgently needed to create awareness among the rural people and further studies are warranted to combat current health challenge.

References

1. Wiersinga WJ, Rhodes A, Cheng AC, Peacock SJ, Prescott HC. Pathophysiology, transmission, diagnosis, and treatment of coronavirus disease 2019 (COVID-19): a review. Jama. 2020 Aug 25;324(8):782-93.
2. World Health Organization. WHO Director-General's opening remarks at the media briefing on COVID 19. 2020. [Updated on: *11 March, 2020*; Viewed on: 15 February, 2021; Website: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020].
3. World Health Organization. Q&A on coronaviruses (COVID-19). 2020. [Updated on: *9 March, 2020*; Viewed on: 12 February, 2021; Website: https://www.who.int/docs/default-source/ searo/ bangladesh/2019-ncov/q-a-en.pdf?sfvrsn=275ce4d2_6].
4. Rahman SM, Hossain SM, uz Jahan M. COVID-19 in Bangladesh: Measures for containment. Bangladesh Medical Research Council Bulletin. 2020 Jun 10;46(1):1-2.
5. Bassetti M, Vena A, Giacobbe DR. The novel Chinese coronavirus (2019-nCoV) infections: Challenges for fighting the storm. Eur J Clin Invest. 2020 January 31;50(3):e13209.
6. Chowdhury MJ. COVID-19 pandemic and Bangladesh. Bangladesh Medical Research Council Bulletin. 2020 Jun 10;46(1):3-4.
7. *The Daily Star.* "Covid-19: 44 die, 2,617 infected in 24 hours". *2020.* [Updated on: *13 August, 2020*; Viewed on: 15 March, 2021; Website: https://www.thedailystar.net/coronavirus-deadly-new-threat/news/covid-19-44-die-2617-infected-24-hours-1944369].
8. World Health Organization. *Modes of transmission of virus causing COVID-19l_: implications for IPC precaution recommendations.* 2020. [Updated on: *29 March, 2020;* Viewed on: 10 March, 2021; Website: https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations].
9. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International journal of biological sciences. 2020;16(10):1745.
10. Christy JS, Kaur K, Gurnani B, Hess OM, Narendran K, Venugopal A, *et al*. Knowledge, attitude and practise toward COVID-19 among patients presenting to five tertiary eye care hospitals in South India - A multicentre questionnaire-based survey. Indian J Ophthalmol. 2020; 68:2385-90.
11. Rahman SM, Akter A, Mostari KF, Ferdousi S, Ummon IJ, Naafi SM, Rahman MM, Uddin MG, Tasmin S, Uddin MA, Lopa SA. Assessment of knowledge, attitudes and practices towards prevention of coronavirus disease (COVID-19) among Bangladeshi population. Bangladesh Medical Research Council Bulletin. 2020 Aug 1; 46(2):73-82.
12. Mahmood S, Hussain T, Mahmood F, Ahmad M, Majeed A, Beg BM, Areej S. Attitude, Perception, and Knowledge of COVID-19 Among General Public in Pakistan. Frontiers in Public Health. 2020 Dec 9; 8:861.
13. Ahmed N, Hassan W, Rasool R, Fahim U, Shakil A, et al. Knowledge, Attitude and

Practices Regarding Covid-19 among a Cross-Sectional Sample from Karachi, Pakistan: Descriptive Data. J Infect Dis Epidemiol. 2020 September 28; 6(5):164.
14. Sultana MS, Khan AH, Islam MR, Hossain S, Hasan MT, Kurasaki M, Sikder MT. Gender differences in Knowledge, Attitude and Preparedness to Respond to COVID-19 among adult population in Bangladesh: A Cross-sectional Study. *Preprints* 2020 Nov 30, (doi: 10.20944/preprints202011.0739.v1).
15. Fatmi Z; Mahmood S; Hameed W; Qazi I; Siddiqui MM; Dhanwani A et al. Knowledge, attitudes and practices towards COVID-19 among Pakistani residents: information access and low literacy vulnerabilities. East Mediterr Health J. 2020; 26(12):1446–1455.
16. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International journal of biological sciences. 2020; 16(10):1745.
17. Hossain MA, Jahid MI, Hossain KM, Walton LM, Uddin Z, Haque MO, Kabir MF, Arafat SY, Sakel M, Faruqui R, Hossain Z. Knowledge, attitudes, and fear of COVID-19 during the Rapid Rise Period in Bangladesh. PloS one. 2020 Sep 24; 15(9):e0239646.
18. Rahman SM, Akter A, Mostari KF, Ferdousi S, Ummon IJ, Naafi SM, Rahman MM, Uddin MG, Tasmin S, Uddin MA, Lopa SA. Assessment of knowledge, attitudes and practices towards prevention of coronavirus disease (COVID-19) among Bangladeshi population. Bangladesh Medical Research Council Bulletin. 2020 Aug 1; 46(2):73-82.
19. Lee M., Kang BA. & You M. Knowledge, attitudes, and practices (KAP) toward COVID-19: a cross-sectional study in South Korea. BMC Public Health 21, 295 (2021).
20. Countryeconomy.com. Bangladesh - Literacy rate 2018. [Internet]**.** [Updated on: *2018;* Viewed on: 16 May, 2021; Website: https://countryeconomy.com/demography/literacy-rate/bangladesh].