Available online at http://jurnal.ahmar.id/index.php/asci

Journal of Applied Science, Engineering, Technology, and Education

ISSN 2685-0591 (Online)

Journal of Applied Science, Engineering, Technology, and Education Vol. 3 No. 1 (2021)
https://doi.org/10.35877/454RI.asci128

Effect of COVID-19 in Bangladesh: Challenge and Overcome

M. Shohel Rana[a*], Mohammad Abu Tareq Rony[b], Nilufa Aktar[c], Kabir Hossain[d], Tonmoy Alam Shuvo[e], Susmita Begum[f], Asma-Ul-Hosna[g]

[a]*Department of Statistics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh, rana.nstu83@gmail.com*
[b]*Department of Statistics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh*
[c]*Department of Statistics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh*
[d]*Department of Statistics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh*
[e]*Department of Statistics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh*
[f]*Department of Statistics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh*
[g]*Department of Statistics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh*

Abstract

To control and minimize, many countries have to try to impose radical lockdown, red zone and movement control or stay on their residents. This study was to determine the Effect of COVID-19 in among the Bangladeshi public. A cross-sectional online survey of 260 Bangladeshi residents of various sectors and professions was conducted via Google form. Descriptive statistics, chi-square tests, t-tests and one-way analysis of variance (ANOVA) were conducted. Principal component analysis (PCA) was considered to design a standardized scale to measure the mental stress and socioeconomic crisis. Logistic regression was applied to estimate the statistically significant association between different variables on awareness level of the country and cluster analysis (CA) was applied to examine the reliability of each item according to the components to develop a composite score. The overall rate of the level of awareness of Bangladeshi people was only 25%, although 96.9% knowing COVID-19 epidemic. 33.5% maintain lock down and 40.0% people maintain social distance. We found lack consciousness of People spreadCOVID-19that may be increase about 68.1% over the country and there is positive correlation between people knowing COVID-19 and awareness level. Losses in education sector are found statistically significant. The PC 1 (first principal component) explained 9.328 % of the variance which was moderate positive loaded with locality people maintain social distance (.568) and strong positive loaded with people maintain lockdown in locality (.619). Moreover, result shows that, stay at home was the best method to reduce this pandemic situation and agriculture sector may overcome this economic distress. However, Meta-Analysis showed that there is strong association between awareness levels of COVID-19 and washing hands daily in the lock down area.

Keywords: COVID-19, challenge, overcome, meta-analysis, cluster analysis.

1. Introduction

A corona virus disease caused by *SARS-CoV-2* (COVID-19) is a highly infectious disease, declared as pandemic by the world health Organization (WHO). Around 5.6 million people have been infected by this virus causing more than 352 thousand deaths worldwide [1]. The number of infected people as well as the death toll is increasing at an

* Corresponding author.
Email address: rana.nstu83@gmail.com (M. Shohel Rana)

alarming rate. Social distancing has been considered to be effective in reducing the rate of human-to-human transmission and minimizing morbidity and mortality [2-4]. However, densely populated developing countries with people barely conscious about social distancing are at high risk of COVID-19 outbreak. An outbreak of a pandemic COVID-19 disease caused by a novel corona virus SAR-CoV-2 has been making a serious threat to human health and the economy of the whole world [5]. The world health organization (WHO) announced COVID-19 as a global pandemic on 11 March 2020.

1.1 What is corona virus?

Any of a family (Coronaviridae) of large single-stranded RNA viruses that have a lipid envelope studded with club-shaped spike proteins, infects birds and many mammals including humans, and includes the causative agents of MERS, SARS, and COVID-19. The genome size of corona viruses ranges from approximately 26 to 32 *Kilogauss*, one of the largest among RNA viruses [9].

The corona virus is a zoonotic disease that many people believe it comes from animals to humans [10]. Corona viruses can reason a variety of illnesses in animals, but in people, corona viruses cause one-third of common colds, fever and sometimes-respiratory infections in untimely infants.

Most common symptoms:
Fever.
Dry cough.
Tiredness.

Less common symptoms:
Aches and pains.
Sore throat.
Diarrhoea.
Conjunctivitis.
Headache.
Loss of taste or smell.
A rash on skin, or discoloration of fingers or toes.

Serious symptoms:
Difficulty breathing or shortness of breath.
Chest pain or pressure.
Loss of speech or movement
Seek immediate medical attention if you have serious symptoms. Always call before visiting your doctor or health facility. People with mild symptoms who are otherwise healthy should manage their symptoms at home. On average it takes 5–6 days from when someone is infected with the virus for symptoms to show, however it can take up to 14 days [11].

Treatment
To date, there are no specific vaccines or medicines for COVID-19. World Health Organization

Self- treatment:
If you feel sick, you should rest, drink plenty of fluid, and eat nutritious food. Stay in a separate room from other family members, and use a dedicated bathroom if possible. Clean and disinfect frequently touched surfaces. Everyone should keep a healthy lifestyle at home. Maintain a healthy diet, sleep, stay active, and make social contact with loved ones through the phone or internet. Children need extra love and attention from adults during difficult times. Keep to regular routines and schedules as much as possible. It is normal to feel sad, stressed, or confused during a crisis. Talking to people, you trust, such as friends and family can help. If you feel overwhelmed, talk to a health worker or counselor.

Medical treatments

If you have mild symptoms and are otherwise healthy, self-isolate and contact your health check provider or a COVID-19 information line for advice. Search for medical care if you have a fever, a cough, tiredness and difficulty breathing. Call in advance.COVID-19 affects different people in different ways. Most infected people will expand kind to moderate illness and recover without hospitalization.

1.2 Background study

On Dec. 27, Dr. Zhang Jixian, head of the respiratory department at Hubei Provincial Hospital, reported to health officials in China that a novel corona virus was causing the disease; by that day, it had infected more than 180 individuals. (Doctors may not have been aware of all of those cases at the time, but only identified those cases after going back over the records, the Morning Post reported). Even with this Nov. 17 case identified, doctors can't be certain the individual is "patient zero," or the very first individual to have been infected with SARS-CoV-2, and there's a chance even earlier cases will be found, the SCMP reported. It affects every country without considering country's race, nationality and economic status [8]. Newly emerging SARS virus is not the first time emerges to the world; it belongs to the family of corona virus. Although these viruses are common in animal but some of them are affect human being [16]. On may 9, 2020 the world health organization (WHO) declared that the pandemic situation globally was "worsening"[14]. A study was able to provide a comprehensive examination of the knowledge, attitudes and practices of Malaysians toward COVID-19 and the findings suggest that Malaysians have an acceptable level of knowledge on COVID-19 and are generally positive in their outlook on overcoming the pandemic [13]. Worldwide billion of people are staying at home to minimize the transmission of the virus and also Bangladesh, a lower-middle income country and one of the world most densely populated countries, is struggling to combat the spread of the virus [15].

The novel corona virus or COVID-19 has brought a dramatic slowdown in the overall life style of the world where Bangladesh became a victim too. TheCOVID-19 pandemic was confirmed to have spread to Bangladesh in March 2020.Institute of Epidemiology, Disease control and research (IEDCR) reported first three cases of COVID-19 in Bangladesh on 8 March 2020.Infection remained low until the end of the March nut showing a steep rise now. Government of Bangladesh announced the lockdown of all educational institutions, government and private office and industries from 26 March. The government also employed armed forces from 24 March to maintain the social distance and prevent the disease. [6] Since the vaccines of COVID-19 are not invented and under research so people's awareness and consciousness are must to prevent the propagation of this virus. But people of Bangladesh seem are not serious about maintaining social distance and lockdown. With the insurgence of the COVID-19 pandemic, a large number of people died in the past several months, and the situation is ongoing with increasing health, social and economic panic and vulnerability. Due to the lack of drugs and prophylaxis against COVID-19, most of the countries are now relying on maintaining social distance as preventative actions. However, this social distancing can create global socio-economic crisis and psychological disorders. On 26 May 2020, with 36751 confirmed cases, 522 deaths and Bangladesh is within the top 25-affected country [7].

Bangladesh is an under developing country so we have limitations in testing COVID-19 and treating the patient properly. Bangladesh also has been facing other epidemics of panic buying, social sigma, fear and hatred. So people should more aware about COVID- 19 in the country. Bangladesh did not impose any strict protocol initially, and millions of people were out on the streets, especially in Dhaka, which is a megacity with 46 thousand people living per square kilometer. It appears that social distancing is tough while taking public commutes and living in the slums. Since its independence in 1971, the annual gross domestic product in Bangladesh has been 8.75 billion, which is expected to reach 315.00 billion USD by the end of 2020 [17].It is very alarming that what will be and how can be tackled the critical situation of the government of Bangladesh. The study has shown present situation of the disease and how can it grow up in future[12] and the result was indicated that the number of cases and number of death would be increased rapidly in near future [12].So it's very much needed to study widely how people of Bangladesh think about this pandemic.

In this article, the challenges in developing countries during COVID-19 pandemic have been analyzed and how to overcome these challenges have been discussed.

1.3 Objective of the study

We conduct the study to know about various perceptions about covid-19 and so on. Like as-

1. To find the awareness level of Bangladeshi people about COVID-19
2. To know the economic distress of Bangladesh
3. To observe the impact of COVID-19 in the social lifeof Bangladeshi people
4. How to overcome this pandemic?
5. To survey, knowledge, attitude, practice and perception regarding COVID-19 among people in Bangladesh.
6. To identify the risk factors and giving peoples an idea about COVID-19.

2. Materials and Method

2.1 Data Collection

A questionnaire was created with a draft of 29 questions based on primary data provided by people of different classes. We have collected260 respondents information about different professions. In this article, we present an effort to compile and analyze outbreak information on COVID-19 based on the several questions about COVID-19.The main aim of this research to deliver a comprehensive overview of the observed and the possible impacts that could appear in the coming days of COVID-19 with the help of statistical analysis. Overall, at the outset of an outbreak like this, it is highly important to readily provide information in order to begin the evaluation necessary to understand the risks and begin containment activities.

This study has been made primary data collected from the Bangladeshi people of various sectors and professions via a Google form.

Method 1: We have used the basic statistical tools that include multiple bar diagram, pie charts, simple correlation, multiple correlations, and logistic Regression and one sample t-tests. We used reliability test to find the significance of difference of the reliability of the study.

Method 2: Principal Component Analysis (PCA), hierarchical Cluster Analysis (CA) and Pearson's correlation matrix (PCM)were applied to analyze the study. PCA is a data reduction tool that demonstrates each potentiality of parameters and their confidence level in sample datasets. Furthermore, hierarchical clustering was used to determine the probable number of clusters.

Method 3: Finally, Meta-analysis was applied in testing independence of two characters.

Whole analysis was done by using SPSS version 16.0, R programming RStudio and MS Excel 2010.

3. Result and Discussion

3.1 Descriptive Statistics

Table 1. Demographic characteristics of participants (N = 260).

Sector	Item	Percentage
Do you know that COVID- 19 is epidemic?	Yes	96.9
	No	3.1
Do you need to go out for work in this situation?	Yes	19.2
	No	80.8

Sector	Item	Percentage
Do you wear musk when go outside?	Yes	95.8
	No	4.2
How many times at least wash your hands daily?	2 times	3.8
	3 times	6.2
	More than 3 times	88.1
	No times	1.9
In your locality, people maintain social distance?	Yes	40.0
	No	60.0
Do you satisfy with our health departments?	Yes	28.5
	No	71.5
Do you some local organization help to support and protect the workers in your locality?	Yes	58.5
	No	41.5
Do people maintain lockdown in your locality?	Yes	33.5
	No	66.5
Which method is the best to prevent COVID -19?	Stay Home	49.6
	Concern About Health	16.9
	Uses of Drugs	1.2
	Maintain Rules By The Govt.	27.7
	Other	4.6
Which factor spread the COVID-19 in BD?	People Come From Abroad	26.1
	Migration	3.1
	Lack of Using Musk	0.4
	Lack of Medical Facilities	1.5
	Unconsciousness of People	68.1
Do you think, people of Bangladesh *have more awareness* aboutCOVID-19?	Yes	13.1
	No	86.9

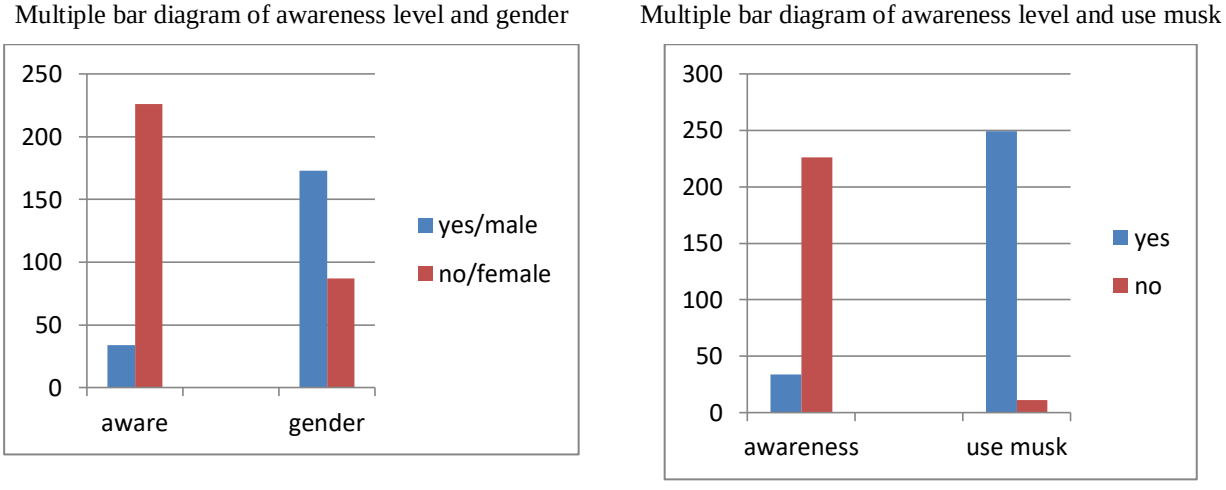

Fig 1. Multiple bar diagram of awareness level and gender. Multiple bar diagram of awareness level and use musk

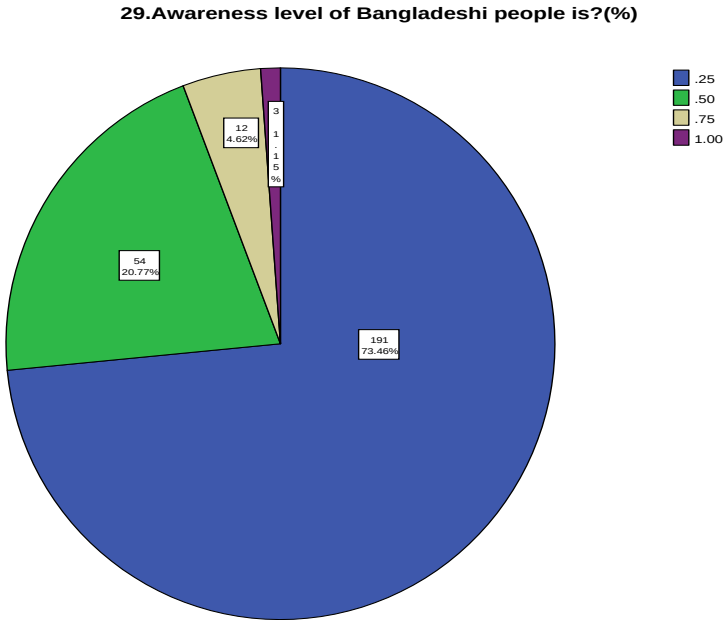

Fig 2. Pie chart indicates that maximum people of Bangladeshi thing awareness level about COVID-19 is 25%.

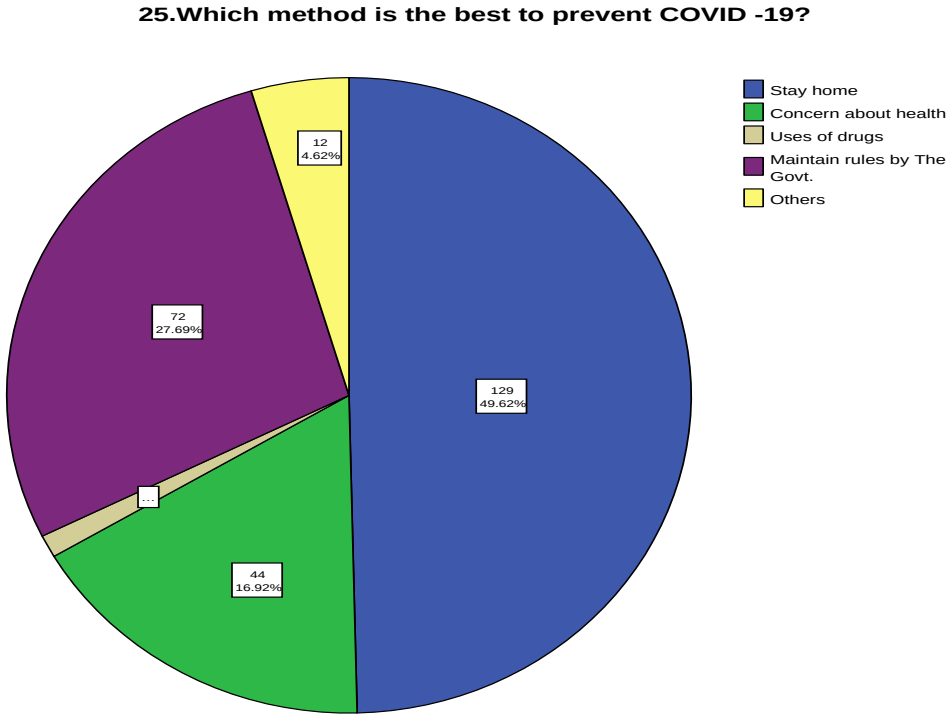

Fig 3. We see that stay home is the best method to prevent COVID-19 that may be decrease about 50% of spreading corona virus.

3.2 Correlations

Table 2 Correlation coefficient of different variables

		Gender	Do you know that COVID-19 is epidemic?	Awareness level of Bangladeshi people is?(%)	Is your earning affected due to COVID-19?
Gender	Pearson Correlation	1	0.015	-0.015	0.030
	Sig. (2-tailed)		0.807	0.815	0.630
	N	260	260	260	260
Do you know that COVID-19 is epidemic?	Pearson Correlation	0.015	1	0.191**	-0.102
	Sig. (2-tailed)	0.807		0.002	0.101
	N	260	260	260	260
Awareness level of Bangladeshi people is?(%)	Pearson Correlation	-0.015	0.191**	1	-0.006
	Sig. (2-tailed)	0.815	0.002		0.924
	N	260	260	260	260
Is your earning affected due to COVID-19?	Pearson Correlation	0.030	-0.102	-0.006	1
	Sig. (2-tailed)	0.630	0.101	0.924	
	N	260	260	260	260

**. Correlation is significant at the 0.01 level (2-tailed).

Here we can see positive and negative correlation. Some of them are weakly correlated, some are moderate correlated. We found from above table there is a positive correlation between people knowing COVID-19 and awareness level.

3.3 Logistic Regression analysis and their coefficients.

Table 3. Logistic Regression analysis and their coefficients

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Go_For_Work	0.682	0.431	2.505	1	0.113	1.979
	Wearing_ Musk	-0.363	0.890	0.890	1	0.683	0.696
	Locality_ Social _Distance?	0.287	0.401	0.401	1	0.474	1.332
	Satisfaction	1.060	0.399	7.502	1	0.008	2.886
	Earning	0.917	0.535	2.936	1	0.087	2.502
	Factor	0.166	0.102	2.639	1	0.104	1.181
	Contant	-2.799	1.693	2.735	1	0.098	0.061

a. Variable(s) entered on step 1: Go_For_Work, Wearing_Musk, Locality_ Social _Distance, Satisfaction, Earning, Factor.

The coefficient for go to work saying that, holding wearing mask, locality maintains social distance, satisfaction with govt. agency, earning effect and factor spread the COVID-19 at a fixed value, we will see 97% increase in the odds of getting into awareness of COVID-19 for a one unit increase in go to work during this pandemic. Since exp (0.682)= 1.979.

The coefficient for locality maintain social distance say that, holding wearing musk go for work, satisfaction with govt. agency, earning effect and factor spread the COVID-19 at a fixed value, we will see 33% increase in the odds of getting into awareness of COVID-19 for a one unit increase in locality maintain social distance during this pandemic. Since exp (0.287) = 1.332.

The coefficient for earning effect say that, holding wearing musk go for work, satisfaction with govt. agency, locality maintains social distance and factor spread the COVID-19 at a fixed value, we will see 150% increase in the odds of getting into awareness of COVID-19 for a one unit increase in earning effect during this pandemic. Since exp (0.917) = 2.502.

3.4 Overcome method

H_0: There is no association between awareness about COVID-19 and agriculture can overcome this economic distress.

Table 4 The Association between awareness about COVID-19 and agriculture can overcome this economic distress.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	16.678[b]	1	< 0.001		
Continuity Correction	15.207	1	< 0.001		
Likelihood Ratio	18.427	1	< 0.001		
Fisher's Exact Test				< 0.001	< 0.001
N of Valid Cases	260				

a. Computed only for a 2*2 table
b. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.08.

Chi-square table show the aware level about COVID-19 and agriculture can overcome this economic distress is more statistically significant.

H_0: there is no association between aware about COVID-19 and awareness level of Bangladeshi people by percentage.

Table 5 Association between aware about COVID-19 and Awareness level of Bangladeshi people

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.034[a]	3	< 0.001
Likelihood Ratio	18.901	3	< 0.001
N of Valid Cases	260		

[a] 3 cells (37.5%) have expected count less than 5. The minimum expected count is 0.39.

Chi-square table shows that awareness of COVID-19 and awareness level of Bangladeshi people by percentage is more statistically significant.

Table 6 One sample t test of significant variables

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
How much losses in education sector in pandemic? (%)	45.525	259	< 0.001	0.68173	0.6522	0.7112
Awareness level of Bangladeshi people is?(%)	34.653	259	< 0.001	0.33365	0.3147	0.3526
Age by group	6.782	258	< 0.001	26.255	0.1863	0.3388

Results of t-test showed that all selected three variables are statistically significant.

Table 7 Reliability test of statistics

Case Processing Summary			
		N	%
Cases	Valid	260	100.0
	Excluded[a]	0	0.0
	Total	260	100.0
a. Listwise deletion based on all variables in the procedure.			

Table 8 Reliability Statistics

Cronbach's Alpha	N of Items
0.095	29

Alpha 0.95% means, there is 5% chance of the suggested answer not accurate Alpha = 0.095 < 0.7

Table 9 Principal component analysis of significant variables

Component Matrix[a]

	Variable	Component											
		1	2	3	4	5	6	7	8	9	10	11	12
1.	Age	-0.073	0.421	-0.108	-0.047	0.214	0.161	0.307	0.384	-0.161	-0.360	-0.113	0.127
2.	Gender	-0.193	0.379	0.249	0.419	-0.127	-0.053	0.179	-0.278	0.241	-0.089	0.045	-0.274
3.	Where do you live in?	-0.367	-0.093	0.259	-0.037	0.104	-0.108	0.188	0.378	0.389	0.076	0.024	-0.086
4.	What is your occupation?	-0.039	0.234	-0.087	.368	0.053	-0.331	0.142	-0.060	0.160	0.231	0.182	0.058
5.	Do you know that COVID-19 is epidemic?	-0.149	0.281	-0.176	-0.099	0.312	-0.043	0.608	0.070	-0.145	0.183	-0.047	0.179
6.	Are you affected in COVID-19?	0.143	-0.011	0.254	0.173	-0.064	0.003	-0.424	0.379	-0.463	0.012	0.011	0.229
7.	Do you need to go out for work in this situation?	0.045	0.190	0.412	0.286	0.065	0.105	0.043	-0.385	-0.038	0.348	-0.103	0.276
8.	Do you	0.238	-0.271	-0.343	0.186	0.389	0.052	-0.023	-0.307	0.230	-0.245	0.041	0.041

Variable	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
wearing musk when go outside?												
9. How many times at least wash your hands daily?	0.043	0.088	-0.145	0.146	-0.032	0.520	0.074	-0.052	0.128	0.141	-0.212	0.463
10. In your locality, people maintain social distance?	0.568	-0.335	-0.012	-0.086	-0.325	-0.076	0.256	0.005	0.013	0.094	0.083	0.020
11. Do you maintain social distances when go outside?	0.304	-0.312	-0.279	0.305	0.300	0.279	0.006	0.008	0.069	-0.208	0.346	0.142
12. Do you satisfy with our health departments?	0.592	0.176	0.001	-0.323	0.257	-0.005	0.064	0.075	0.089	-0.008	-0.203	-0.022
13. Do you think COVID- 19 test facilities is available in our country?	0.447	0.201	0.002	-0.158	0.041	0.225	-0.206	-0.024	0.196	0.057	0.002	-0.072
14. Are you satisfy with Govt. agencies?	0.498	0.302	-0.104	-0.235	0.291	-0.196	-0.043	0.057	0.072	0.175	-0.017	-0.086
15. Do you think, this virus hampers our economic development?	-0.123	0.076	-0.036	-0.184	0.204	0.176	-0.381	0.312	0.387	0.308	0.157	-0.079
16. Do you think government budget for COVID- 19 is enough?	0.330	0.423	-0.019	0.225	-0.040	-0.171	-0.291	-0.002	0.208	0.097	0.089	0.343
17. Do you know any local organization help to support and protect the workers in your locality?	0.313	-0.090	0.301	0.243	0.306	-0.368	0.008	0.195	-0.062	0.116	-0.062	0.017
18. Do people maintain lockdown in your locality?	0.619	-0.294	-0.004	-0.182	-0.295	-0.177	0.289	0.047	0.059	0.088	0.027	0.114

Variable	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
19. Do you think COVID -19 affect in tourism sector?	-0.001	-0.188	-0.090	0.249	-0.399	0.172	0.167	0.289	-0.045	0.277	0.152	0.086
20. Do you provide any advice to maintain hygienic in your local people?	-0.052	-0.337	0.287	0.262	0.433	0.007	0.142	0.183	-0.029	0.127	0.278	-0.048
21. Is your earning affected due to COVID-19?	-0.240	-0.178	0.516	-0.229	0.034	0.025	-0.041	-0.039	0.204	-0.367	0.152	0.309
22. How much losses in education sector in pandemic? (%)	-0.054	0.598	-0.110	0.031	-0.166	0.072	0.073	0.177	0.034	-0.054	0.418	0.001
23. Do you think, domestic violence is increasing in society?	0.027	-0.261	-0.052	0.411	0.052	-0.295	-0.092	0.168	0.141	-0.134	-0.524	0.044
24. Do you think, agriculture can overcome this economic distress?	0.193	0.620	-0.173	0.144	-0.070	-0.097	-0.113	-0.032	-0.160	-0.025	0.022	-0.186
25. Which method is the best to prevent COVID -19?	0.062	-0.051	-0.410	0.464	-0.182	-0.041	-0.034	0.268	0.102	-0.224	-0.060	-0.081
26. Which factor spread the COVID-19 in BD?	0.142	0.169	0.278	0.219	0.037	0.546	0.089	0.134	0.059	0.108	-0.342	-0.310
27. Is there social distance minimize the spread of COVID- 19?	0.124	-0.334	-0.068	0.146	0.247	0.198	-0.040	-0.123	-0.403	0.200	0.155	-0.297
28. Do you think, people of Bangladesh has more aware about COVID-19?	0.386	0.339	0.415	0.108	0.078	-0.005	0.050	-0.046	-0.210	-0.350	0.133	0.010
29. Awareness level of	-0.562	0.100	-0.343	-0.093	0.222	-0.184	-0.143	-0.087	-0.212	0.167	-0.080	0.173

Variable	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
Bangladeshi people is?(%)												
Extraction Method: Principal Component Analysis.												
a. 12 components extracted.												

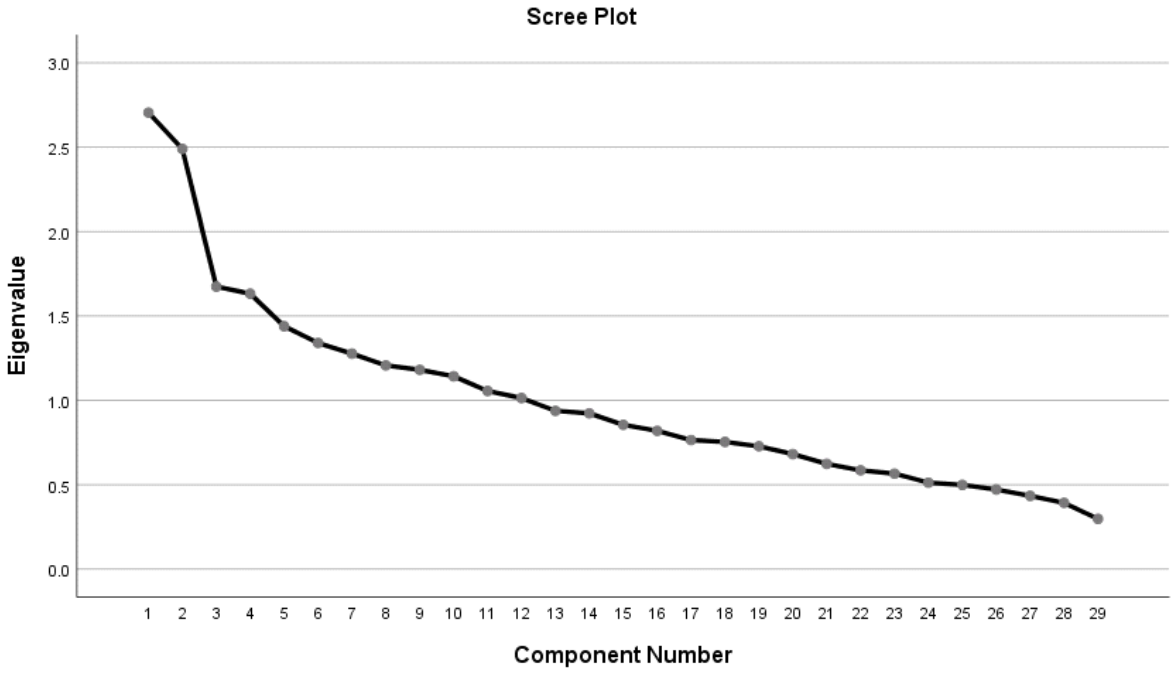

Fig 4 Plot of eigenvalues vs different component.

The plot (Figure 04) shows that a total of twelve components can be retained (determined by components with eigenvalues greater than 1).

Table 10 Total variance explained corresponding twelve components and others.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.705	9.328	9.328	2.705	9.328	9.328
2	2.490	8.586	17.914	2.490	8.586	17.914
3	1.674	5.773	23.686	1.674	5.773	23.686
4	1.632	5.628	29.314	1.632	5.628	29.314
5	1.439	4.963	34.277	1.439	4.963	34.277
6	1.340	4.621	38.899	1.340	4.621	38.899
7	1.277	4.402	43.301	1.277	4.402	43.301
8	1.207	4.162	47.463	1.207	4.162	47.463
9	1.181	4.072	51.535	1.181	4.072	51.535
10	1.142	3.940	55.475	1.142	3.940	55.475
11	1.056	3.640	59.115	1.056	3.640	59.115
12	1.014	3.495	62.610	1.014	3.495	62.610

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
13	0.938	3.234	65.844			
14	0.923	3.183	69.027			
15	0.855	2.948	71.975			
16	0.819	2.826	74.801			
17	0.764	2.636	77.437			
18	0.754	2.598	80.035			
19	0.728	2.509	82.545			
20	0.681	2.349	84.894			
21	0.624	2.150	87.045			
22	0.585	2.018	89.062			
23	0.566	1.951	91.013			
24	0.512	1.766	92.778			
25	0.499	1.720	94.499			
26	0.472	1.626	96.125			
27	0.434	1.496	97.621			
28	0.392	1.353	98.974			
29	0.298	1.026	100.000			

Extraction Method: Principal Component Analysis.

The PC 1 (First) explained 9.328 % of the variance which was moderate positive loaded with locality people maintain social distance (0.568) and strong positive loaded with people maintain lockdown in locality (0.619).
The PC 2 (second) explained 8.58% of the variance which was strong positive loaded with agriculture can overcome this economic distress (0.62).
The PC 3 (third) explained 5.77% of the variance which was moderate positive loaded with earning affected due to COVID-19 (0.516).
The PC 6 (six) explained 4.621 % of the variance which was moderate positive loaded with many times at least wash your hands daily (0.520).
The PC 7 (seven) explained 4.402% of the variance which was strong positive loaded with you know that COVID- 19 is epidemic (0.608).
The PC 11 (eleven) explained 3.640% of the variance which was moderate negative loaded with you think, domestic violence is increasing in society (-0.524).

All other PC was weak positive and negative loaded.

3.5 Meta-Analysis

H_0: Level of awareness independent of washing hands daily
H_1: Level of awareness is not independent of washing hands daily
The test statistic is

$$\chi^2 = \sum\sum \frac{O\text{ji}^2}{Eij^2} - n$$

$$\chi_1^2 = 103.099 - 103$$
$$= 0.099$$
$$\text{P1} = 0.991957$$

The result is not significant at P<0.05

$$\chi_2^2 = 175.98 - 157$$
$$= 18.98$$
$$\text{P2} = 0.000276$$

The result is significant at P < 0.05

For conclusion using data of people maintain lockdown in locality, meta-analysis can be performed by combining 2 Chi-squares, where the combined P value is given by:

$$-2\ln P = -2\ln(P1 * P2)$$

$$= -2\ln(0.991957 * 0.000276) = 16.41$$

This $-2\ln P$ is distributed as χ^2 with 2k (number of locality) df.The tabulated value of χ^2 at 5% level with 4 df is 9.488 which is less than calculated $\chi^2(-2\ln P)$.

So $H_0$of independence of levels of awareness and washing hands daily is rejected. That means level of awareness is dependent of washing hands daily in locality maintain lockdown.

The calculation can be done by combining the value of $\chi^2$of locality, where combined $\chi^2$is

$\chi^2 = \chi^2_1 + \chi^2_1 = 0.099 + 18.98 = 19.079$

This χ^2 has 3+3=6 df. So $\chi^2 0.05{,}6 = 12.592$

This is less than the calculated value.

So, the H_0 is rejected. That means level of awareness of COVID-19 is statistically association of people washing their hands daily in lockdown of locality.

3.6 Cluster analysis (CA) between Variables

From the figure 5, Cluster analysis (CA) represent educations in losses, method of prevent of COVID -19, agriculture can overcome this economic distress and local organization help to support are same clustered also located away from other clusters. Also Cluster analysis (CA) indicates that the selected variables of the study connected to each others.

4. Conclusion

In summary, this study was able to present a comprehensive assessment of the knowledge of challenges and overcome toward COVID-19 in Bangladesh. The findings suggest that Bangladesh has a satisfactory level of knowledge on COVID-19 and are generally positive in their attitude to overcoming the pandemic, but people does not maintain social distance and not maintain the rules of Govt. This study has been shown what challenge they can face and how to overcome this pandemic. Finally, this evaluation process could help the government and policy makers to judge the public awareness in an emergency situation to deal with COVID-19 outbreak.

Acknowledgment

When we embarked on our journey we decided that, although being the first, this would be the very last page of the report that I would write. We have learnt a lot in the process, not least, about how complex covid-19 development is and what impact it leaves on. Although we are solely responsible for its contents, the completion of this report would not have been possible without support from a number of persons to whom we are deeply indebted. First, we want to express my gratitude to the people who have taken time to enlighten us on the issues covered in this dissertation. Without their participation in the interviews, help with practical matters, generosity and friendship this would never have materialized.

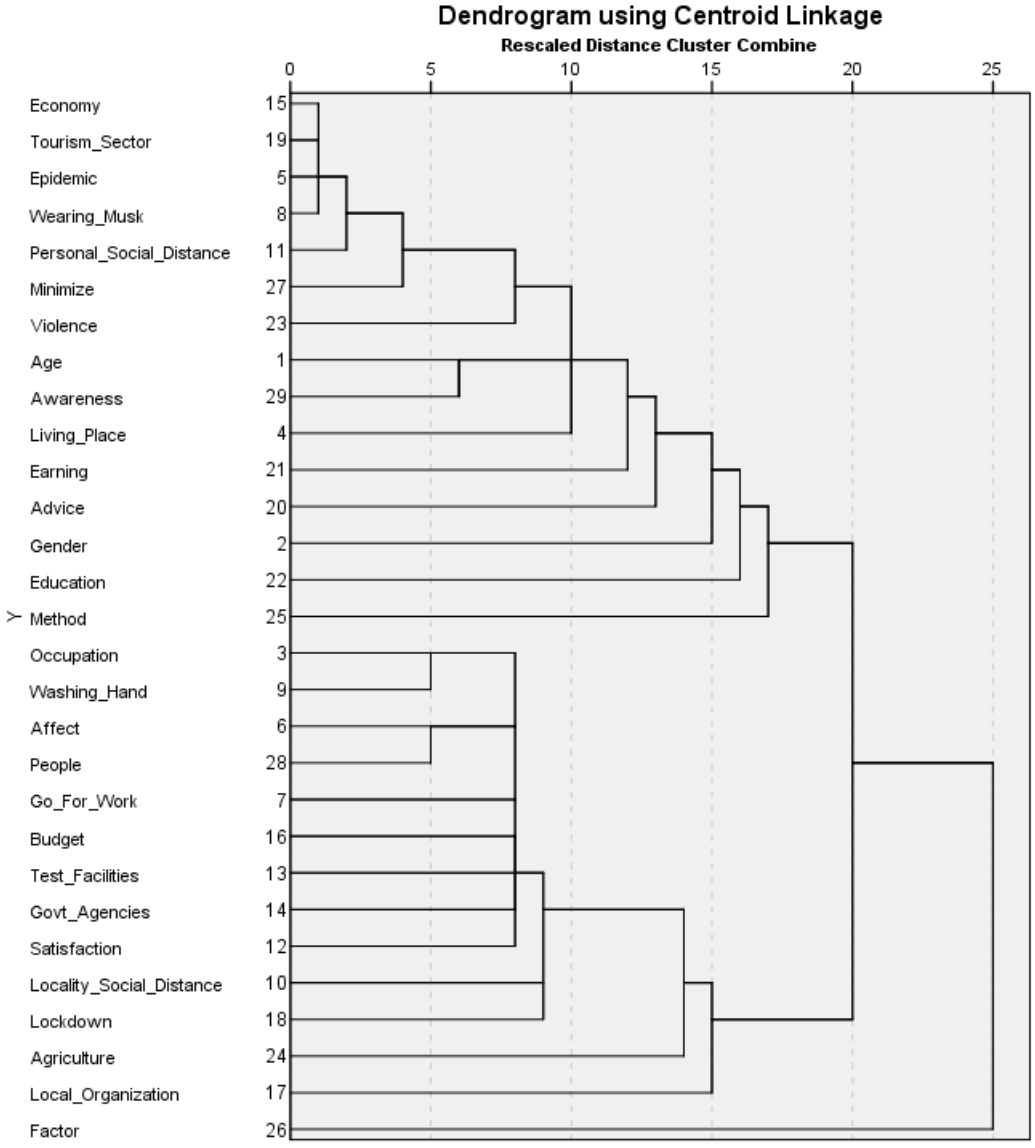

Fig 5 Cluster analysis (CA) includes all the variables under study.

References

[1] World Health Organization. Coronavirus disease 2019 (COVID-19): situation report-94. 2020. [Available from: https://www.who.int/emergencies/diseases/novel-coronavirus- 2019/situation-reports] Accessed on: April 24, 2020.

[2] Chen S, Yang J, Yang W, Wang C, Bärnighausen T. COVID-19 control in China during mass population movements at New Year.*The Lancet* 2020; 395(10226):764-6.

[3] Wilder-Smith A, Freedman D. Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak. *J Travel Med* 2020;27(2):taaa020.

[4] Poletti P, Caprile B, Ajelli M, Pugliese A, Merler S. Spontaneous behavioural changes in response to epidemics. *J TheorBiol*2009; 260(1):31-40.

[5] MashuraShammi, Md. Bodrud-Doza , Abu Reza Md. Towfiqul Islam, Md. MostafizurRahman,(2020), "COVID-19 pandemic, socioeconomic crisis and human stress in resource-limited settings: A case from Bangladesh".

[6] Md. Shahidul Islam, JannatunIrana Ira, ,K. M. ArifulKabir, Md. Kamrujjaman (2020), "Effect of lockdown and isolation to suppress the COVID-19 in Bangladesh: an epidemic". (www.preprints.org), Not Peer-Reviewed, Posted: 23 May 2020.

[7] Worldometer, https://www.worldometers.info/coronavirus/.

[8] Khan, M. H., & Hossain, A. (2020). COVID-19 Outbreak Situations in Bangladesh: An Empirical Analysis.doi: https://doi.org/10.1101/2020.04.16.20068312.this version posted April 22, 2020.(not peer review).

[9] Patrick C. Y woo, y. Huang, (2020), and Kwok-Yung Yuen: Coronavirus Genomics and Bioinformatics analysis.

[10] Islam M.S., Ira J.I, KabirK.M.A, and Kamrujjaman M.: COVID-19 Epidemic compartments model and Bangladesh.

[11] World Health Organization (WHO), https://www.who.int/

[12] M. ShohelRana(2020), "Statistical View of Corona Virus (COVID-19) in Bangladesh". *International Journal of statistics and Applied Mathematics*, Vol.-5, No.-3, May-June (2020) pp 1-5.

[13] Azlan AA, HamzahMR, SernTJ, AyubSH, Mohamad E (2020) Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. PLoSONE 15(5): e0233668.

[14] Muhammad Mahmood (2020). Covid-19 Economic challenges facing Bangladesh. The Financial Express, June 13, 2020.

[15] Anwar S, Nasrullah M and Hosen MJ (2020) COVID-19 and Bangladesh: Challenges and How to Address Them. Front. Public Health 8:154. doi: 10.3389/fpubh.2020.00154.

[16] Begum, M., & Farid, M. S. (2020). COVID-19 and Bangladesh: Socio-Economic Analysis towards the Future Correspondence. 18.

[17] Alam, M. S., Alam, M. Z., Nazir, K. H., & Bhuiyan, M. A. (2020). The emergence of novel coronavirus disease (COVID-19) in Bangladesh: Present status,challenges, and future management. 11.