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## The perceived impact of COVID-19 pandemic on healthcare cost in Bangladesh

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## Abstract

The study showed the effect of the COVID-19 pandemic on healthcare expenses including the price of medicines, protective equipment, medical devices, healthcare facilities, and food. A self-administered questionnaire was used as the data collection tool and 400 people from different Bangladesh divisions (Dhaka, Chittagong, Barisal, Khulna, Mymensingh, Rajshahi, and Sylhet) participated in this study. Multiple regression analysis was used to estimate the impact of independent variables on dependent variables. R programming environment was used to perform the statistical analysis. Cronbach's alpha was used for determination of reliability and found acceptable internal consistency. The price of protective equipment (POPE), the price of a healthcare facilities (POHCF), the consequences of rising prices (CRP), and COVID-19 were independent variables. COVID-19 (CRP) was a dependent variable that measured COVID-19's impact (IC). The results of the regression analysis indicated a positive and significant impact of POPE, POHCF, and CRP on IC. However, the variance explained was still low (54.4%). Bangladesh should control the prices of all goods and services because of their influence on the impact of COVID-19. Future research should be conducted to discover other variables that affect the impact of COVID-19.

## Keywords

COVID-19, healthcare cost, medicine cost, protective equipment cost, increasing price level

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# The Perceived Impact of COVID-19 Pandemic on Healthcare Cost in Bangladesh

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## Abstract

The study showed the effect of the COVID-19 pandemic on healthcare expenses including the price of medicines, protective equipment, medical devices, healthcare facilities, and food. A self-administered questionnaire was used as the data collection tool and 400 people from different Bangladesh divisions (Dhaka, Chittagong, Barisal, Khulna, Mymensingh, Rajshahi, and Sylhet) participated in this study. Multiple regression analysis was used to estimate the impact of independent variables on dependent variables. R programming environment was used to perform the statistical analysis. Cronbach's alpha was used for determination of reliability and found acceptable internal consistency. The price of protective equipment (POPE), the price of a healthcare facilities (POHCF), the consequences of rising prices (CRP), and COVID-19 were independent variables. COVID-19 (CRP) was a dependent variable that measured COVID-19's impact (IC). The results of the regression analysis indicated a positive and significant impact of POPE, POHCF, and CRP on IC. However, the variance explained was still low (54.4%). Bangladesh should control the prices of all goods and services because of their influence on the impact of COVID-19. Future research should be conducted to discover other variables that affect the impact of COVID-19.

**Keywords:** COVID-19, healthcare cost, medicine cost, protective equipment cost, increasing price level

## **Introduction**

Due to the onset of COVID-19, a worldwide catastrophe has been ongoing for the last year. A typical pneumonia was first reported in Wuhan, China's capital city, in December 2019, and was subsequently identified as a new coronavirus infection caused by the severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) (Zhou et al., 2020; Zhu et al., 2020). On March 11, 2020, it was initially designated a global health emergency before being renamed a pandemic. Coronavirus had impacted 220 countries, regions, or territories by May 2021, with more than 170 million people becoming sick and almost three million people dying because of the continuing epidemic. The first case in Bangladesh was discovered on March 8, 2020, and the disease quickly spread to over one million confirmed cases, with over 12,000 fatalities (World Health Organization [WHO], 2021a).

Since last year, the COVID-19 pandemic has become a significant global health issue, causing a huge illness burden across the globe (Sharma et al., 2020). Every aspect of human life has been deeply affected by this COVID-19 pandemic. Vulnerabilities of the world economy due to this contagious disease are already a burning issue to discuss. There is widespread speculation of an increasing price level of daily necessities and medicine in underdeveloped, developing, and developed countries. High demand, insufficient supply, lockdown, and shutdown of industries have major influences on price levels, and all these phenomena have occurred due to the COVID-19 pandemic. The aim of this research was to determine the perception of the general people of Bangladesh towards healthcare costs because of the rising price levels of different commodities in this critical situation.

## **Research Objectives**

- To investigate the impact of the price of protective equipment on the impact of COVID-19,
- To examine the impact of the price of healthcare facilities on the impact of COVID-19,
- To analyze the impact of rising food prices on the impact of COVID-19.

## **Literature Review**

As the epidemic unfolds, more information regarding COVID-19's pathogenesis and transmission becomes available. SARS-CoV-2 is thought to be transferred mostly via respiratory droplets, which are transferred between individuals who have close human contact (usually within about 6 feet). Viruses produced through respiratory secretions (such as coughing, sneezing, or talking) may infect others through mucous membrane contact (WHO, 2020a). The virus can also persist on surfaces for different periods of time and degrees of infection. Asymptomatic patients account for about 40-45% of SARS-CoV-2 infections. These asymptomatic carriers can spread the infection to other people for a longer period, perhaps more than 14 days, causing wide spreading of the disease in the community (Cennimo et al., 2020).

The clinical situation for COVID-19 is very different. Most patients are asymptomatic or have only mild or severe respiratory symptoms, which can lead to serious medical conditions or even death. The symptoms of COVID-19 are very similar to those of other respiratory viral infections. Among all COVID-19 patients, about 5-15% can deteriorate to severe or critical disease and require intensive support and monitoring (Basher et al., 2020). Case fatality rates vary from

country to country. The disease's clinical outcome is influenced by the strain's virulence, the host's immunological response, genetic and environmental variables, and the quality of the healthcare delivery system (Samaddar et al., 2020). To identify the new coronavirus, WHO (2020b) recommendations suggest real-time reverse transcription polymerase chain reaction (RT-PCR) molecular testing on respiratory specimens such as nasopharyngeal and oropharyngeal swabs, bronchoalveolar lavage fluid, sputum, or bronchial aspiration.

Mild cases of COVID-19 can be treated with telemedicine at home. Severely ill and critically ill COVID-19 patients are usually admitted to an intensive care unit for close monitoring and prompt decisions are made where strong care support is required. Early treatment includes use of medications, oxygen therapy, and other necessary supports (Directorate General of Health Services, 2020). Several therapeutic agents have been used to treat COVID-19, but currently there is no effective drug (Wang et al., 2020). The WHO and its partners have been working tirelessly to research, produce, and distribute safe and effective vaccinations. Vaccine expeditions have been undertaken by research institutions and pharmaceutical firms all around the globe (WHO, 2020c). As a result, before a viable vaccination or proven therapy could be developed, the worldwide community relied largely on non-pharmaceutical treatments to manage COVID-19. The moderation and constraint techniques employed in this continuing epidemic include seclusion, border restrictions, isolation, physical distance, wearing masks, and hand washing. Public health interpolation has been related to decreasing the spread of COVID-19 in several impact assessment studies (WHO, 2020d). The challenge of this suppression strategy is the need to extend the storage time of the non-pharmaceutical treatments until the vaccine can be used. In the case of insufficient property, prolonged blockades are unsustainable and can lead to widespread unemployment and social and economic unrest (Cowling et al., 2020).

The first mass immunization campaign began in early December 2020, and 13 different types of vaccines developed by several pharmaceutical companies have been used for this campaign so far (WHO, 2021b). Safe and efficient vaccinations are seen as a game-changing weapon, but for the time being, everyone must continue to wear masks, wash their hands, maintain adequate interior ventilation, and physically distance from crowds (WHO, 2020e). Being vaccinated does not imply that individuals may disregard caution and put themselves and others at risk, especially because research into how well vaccinations protect against illness and the severity of infection, transmission, and other variations is currently continuing. It is necessary to guarantee that vaccinations are distributed fairly and equally and that every nation gets them and can use them to safeguard its citizens, beginning with the most vulnerable. The COVID-19 nationwide immunization campaign in Bangladesh began on February 7, 2021, based on a set of criteria that prioritized the most vulnerable members of the population (WHO, 2021b).

With an increasing incidence and case fatality due to COVID-19, health systems across the globe are facing significant difficulties in terms of preventing disease, transmitting disease, detecting new cases, providing medical treatment, and guaranteeing recovery (OECD, 2020). Hospitals are overburdened with suspected and confirmed patients, and there are lengthy lines for diagnostic testing, outpatient care, and hospital admission. This scenario has been exacerbated by a lack of intense care unit beds, a paucity of healthcare professionals, and a high infection rate among these frontline fighters. Elective surgical procedures have been postponed and rehabilitation of disabled persons has been hampered. As COVID-19 continues to spread, its impact on the healthcare system is without precedent with increased direct and indirect medical costs.

Healthcare resources are extensively spending on diagnosis and management of this contagious disease. Need of personal protective equipment for healthcare providers along with management of large quantities of hazardous medical waste have been increasing the cost. On the other hand, hospitals are losing revenue from elective surgery and other procedures (American Hospital Association, 2020).

As impacts of the disease continue, the economic consequences of the pandemic are starting to unfold as dramatic rises in unemployment and poverty rates, and there is the warning of recession. As the COVID-19 pandemic penetrates more deeply, prices for daily necessities are starting to rise because of stocking up by consumers, changes in supply and distribution chain, closure of factories. Grains, meat, fish, dairy, and eggs were especially affected by the shifting economy brought on by the pandemic (Chowdhury, 2020). There is a considerable crisis in the health market, too. The use of facemasks is increasing substantially, exacerbating the global supply shortage with prices soaring. The situation worsened when countries banned exportation of facemasks to prioritize local demand. Due to acute shortages and increased demand, prices of hand sanitizer and protective equipment have significantly increased, and it might have a negative effect on the health and safety of people (Zhou, 2020). The pharmaceutical supply chain has also been disrupted as China, the largest supplier of the world's active pharmaceutical ingredients, was heavily affected by the pandemic (Rewarj et al., 2020).

The COVID-19 pandemic caused price fluctuations according to the U.S. Bureau of Labor Statistics, especially in the food industry (U.S. Bureau of Labor Statistics, 2020). To prevent the spread of the illness, several locations have issued stay-at-home orders. These limitations have decreased restaurant demand, essentially turning restaurants into takeaways. However, demand for grocery shops has increased since customers are unsure how long they will be confined at home, resulting in increased food purchases (Haley & Gale, 2020). When a COVID-19 outbreak develops at a factory, some businesses are forced to shut or restrict production capacity, making it impossible for suppliers to fulfill this rising customer demand. Furthermore, manufacturers are attempting to change the orientation of the restaurant industry, as well as the processing and supply routes for restaurants. Different product sizes and packaging specifications are required by supermarket institutional clients. Owing to a shortage of markets, farmers have been compelled to accept lower prices for their goods or destroy perishable goods due to a lack of demand from processors (Condon & Nason, 2020; Reiley, 2020). Between March and June 2020, the producer price index dropped just 0.1% of final demand for foods, but the modest cumulative shift obscures the index's potential for monthly volatility (Mead et al., 2020). Because there was no change in March 2020, food consumption decreased by 0.5% in April 2020 (U.S. Bureau of Labor Statistics, 2020).

According to Waggoner (2020), the Consumer Price Index measured the cost that American people pay for goods and services. Goods and services price rose 0.6% over the past 12 months. They said price of beef and veal, eggs, pork, and poultry increased 25.1%, 12.1%, 11.8%, and 8.7% respectively. The Consumer Price Index also reported three main reasons for rising price in this COVID-19 situation (U.S. Bureau of Labor Statistics, 2020). One is demand; another is a shift from eating in restaurants to eating at home; the third is because this disease has closed or shutdown many industries e.g., processed foods and meats.

Bangladesh Bureau of Statistics (2020) data shows that the point-to-point inflation rate increased 5.46% to 5.48% from February to March 2020. Because of COVID-19, the price of rice, lentils, cooking oil, salt, and other necessities have all increased. Large numbers of shoppers regularly gather at grocery stores, nearby convenience stores, and pharmacies to purchase large quantities of daily necessities (The Business Standard, 2020). During the COVID-19 crisis, prices for medicines, especially those used to treat allergies, sneezing, coughs, and respiratory illnesses increased compared to before the COVID-19 period. The soaring prices of necessities make sufferers of chronic obstructive pulmonary disease, asthma, and allergies must take medication all year round. Regulators and pharmaceutical company owners claim that drug prices have not risen since the emergence of the coronavirus in the Bangladesh, but consumer and patient rights activists claim that people are buying the same drugs at higher prices than they were before the crisis (Maswood, 2020).

Like other developing and developed countries, the healthcare system of Bangladesh is facing a great challenge in this pandemic. The healthcare system of Bangladesh is already burdened with large number of patients, lack of hospital beds, critical care facilities, and shortage of healthcare professionals; and COVID-19 is making additional trouble for this over-burden system (Anwar et al., 2020). Lack of test kits, admission difficulties in hospitals, shortcomings of skilled professionals, and inadequate protective equipment have all been observed during this crucial time (Jahangir, 2020). Treatment of non-communicable diseases along with surgical care has been disrupted since the beginning of the pandemic. High prices of daily goods, medicine, and protective equipment including facemasks and medical devices are putting the whole system in jeopardy (Grimm, 2020; Haque et al., 2020). As Bangladesh has adopted an out-of-pocket expenditure model for payment of healthcare, the increased tendency of rising direct and indirect medical costs will deny access to healthcare for all citizens (Rahman et al., 2020). On the other side, there is the rising level of unemployment due to business shutdown (Shammi et al., 2020). Hence, the current research was conducted in this backdrop to evaluate the perceived impact of COVID-19 pandemic on healthcare cost of Bangladesh.

Based on the previous literature review, the hypotheses of this research are defined as following:

### ***Hypotheses***

- There is positive impact of the price of protective equipment on the impact of COVID-19.
- There is positive impact of the price of healthcare facilities on the impact of COVID-19.
- There is positive impact of rising food prices on the impact of COVID-19.

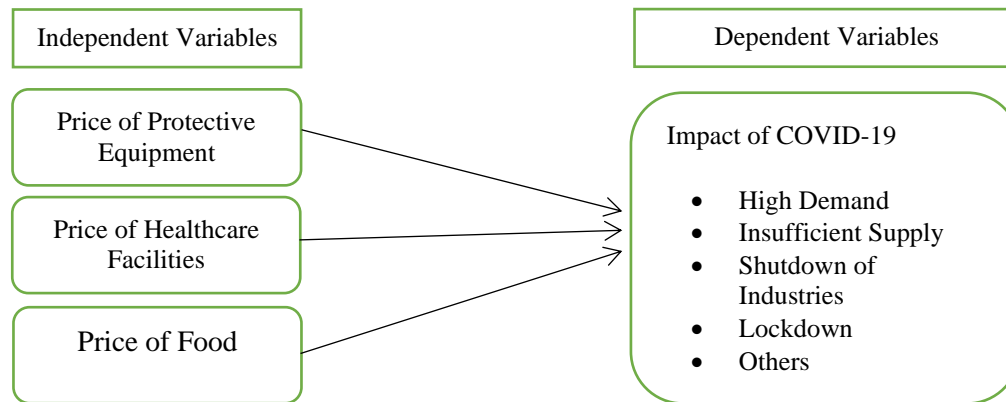
These hypotheses indicate that when the independent variables increase, the impact of COVID-19 will also increase in the same direction. For instance, when the POPE increases, the impact of COVID-19 will increase.

### ***Conceptual Model***

The conceptual model (see Figure 1) shows that independent variables may have impact on the impact of COVID-19. The WHO has suggested some medicines, protective equipment, and food to combat the current situation. According to American Hospital Association (2020), due to COVID-19, many people are now using medical equipment, medicine, and other resources. This

model shows that there are many reasons for the increase in the healthcare costs. High demand means sellers of healthcare equipment sometimes cannot provide the equipment due to large number of buyers. Besides high demand, insufficient supply, the shutdown of many industries, lockdown, and other factors are now influencing the healthcare costs. These equipment and medicine are become the emergency need for people. However, the price of some products has risen beyond affordability in this crucial time period. Researchers created this model for the analysis and show the impact of COVID-19 on the increase of the price of some products and their consequences.

**Figure 1.** Conceptual Model of the Study



## Methods

This study adopted descriptive-survey design, which involves the collection of data concerning the general people of Bangladesh. To realize this study, primary and secondary data were used. Primary data was collected through self-administrated questionnaires. Secondary data was gathered from scientific papers, journals, books, newspapers, and magazines. Researchers could use a sample of 400 from a greater than 10,0000 population at 5% margin error and 95% confidence level (Cochran, 1963). The researchers used random sampling method for this study. The sample was collected for the study from seven divisions of Bangladesh (Dhaka, Chittagong, Barisal, Khulna, Mymensingh, Rajshahi, and Sylhet). The data were collected from self-administrated questionnaires for the empirical analysis of this study. An R programming environment was used to determine the impact between variables.

## Instrument Design

The price of protect equipment was measured using a five-point Likert scale. Respondents were asked to express their opinion on surgical masks, hand gloves, hand sanitizer liquid soap, and N95 respirators. Five items were presented. POHCF was measured using a five-point Likert scale. Respondents expressed their opinion on doctor consultation fees, diagnostic tests, nursing and auxiliary services, operative procedures, hospital admissions and accommodations, and others. Six items were used for this factor. Consequences of rising price levels were measured by seven items measured on a five-point Likert scale. The items were inability to consult a doctor, inability to do diagnostic tests, inability to continue treatment, inability to follow protective measures, curtailing of meals or other basic needs, financial burden, and anxiety or depression. The impact of COVID-19 was measured by five items: high demand, insufficient supply,



shutdown of industries, lockdown, and others were used. All 23 items were responded to using five-point Likert-type scales with anchors oscillating from (1) *strongly disagree* to (5) *strongly agree*.

### **Reliability Test**

Cronbach's alpha coefficient was used to assess item dependability and determine if they might be grouped. When the value of Cronbach's alpha ( $\alpha$ ) is higher than .9, the internal reliability of Cronbach's alpha ( $\alpha$ ) is *Excellent*. When the value of Cronbach's alpha ( $\alpha$ ) is higher than or equal to .8 and less than .9, the internal consistency of Cronbach's alpha ( $\alpha$ ) is *Good*. When the value of Cronbach's Alpha is higher than or equal to .7 and less than .8, the reliability coefficient of Cronbach's alpha ( $\alpha$ ) is *Acceptable*. When the value of Cronbach's alpha is higher than or equal to .6 and less than .7, the internal consistency of coefficient alpha ( $\alpha$ ) is *Questionable*. And when the value of Cronbach's alpha is higher than or equal to .5 and less than .6, the internal validity of Cronbach's alpha ( $\alpha$ ) is *Bad* (Gliem & Gliem, 2003). For each factor, the researchers looked at the Cronbach's alpha ( $\alpha$ ). Taber (2018) introduced an additional kind of analytical coefficient alpha ( $\alpha$ ). As a result, alpha values are considered excellent when they are between .93 and .94, strong when they are between .91 and .93, reliable when they are between .84 and .90, robust when they are .81, fairly high when it is between .76 and .95, high when it is between .73 and .95, good when it is between .71 and .91, relatively high (.70–.77), slightly low (.68), reasonable (.67–.87), adequate (.64–.85), moderate (.61–.65), satisfactory 0.58–.97), acceptable (.45–.98), sufficient (.45–.96), not satisfactory (.4–.55) and low (.11). In the current study, alpha for POPE was .84, .85 for POHCF, .79 for CRP and .78 for IC. Alpha was good for POPE and POHCF. It was acceptable for CRP and IC.

### **Regression Models**

As data collected were ordinal, to use regression analysis, a Likert scale was calculated to find a composite score by calculating the mean of all items for each latent variable (Subedi, 2016). After calculating the mean for all variables, linear regression was performed. Regression was used because it allows for analyzing relationships between dependent and independent variables (Sarstedt & E. Mooi, 2014). The linearity of the model was tested using rainbow test. The results confirmed that the model was linear ( $df1 = 214$ ,  $df2 = 209$ ) = 1.0052,  $p$  value = .485. Multicollinearity was tested by calculating the variance inflated for (VIF). VIF was 1.07 for POPE, 1.2 for POHCF, and 1.13 for CRP. To test the impact of each independent variable on the dependent variable, the following model was proposed:

$$Y = \beta_0 + \beta_1 POPE + \beta_2 POHCF + \beta_3 CRP + \varepsilon$$

Where:

- Y = Impact of COVID-19
- POPE = Price of protective equipment
- POHCF = Price of healthcare facilities
- CRP = Consequences due to COVID-19
- e=Error term
- $\beta$  =Beta

## Findings

### *Respondent's Demographic*

Table 1 shows the demographic information for the respondents. In the location analysis, the researchers found that 32.8% of the respondents were from Dhaka, 5% of the respondents were from Chittagong, 1% of the respondents were from Barisal, 5.3% of the respondents were from Khulna, 2.8% of the respondents were from Mymensingh, and 50% of the respondents were from Rajshahi, 3.3% of the respondents from Sylhet. In the gender analysis, the researchers found that 28.5% of the respondents were male and 71.3% of the respondents were female. In the occupation analysis, the researchers found that 18.8% of the respondents were healthcare professionals, 1.3% were bankers, 1.5% were businesspeople, 31.5% were medical students, 30% were general students, 7.8% were teachers, and 9.3% were from other occupations. In the age analysis, the researchers found that 76.5% of the respondents were below 30 years old, 20.5% of the respondents were 30 to 45 years old, and 3% of the respondents were above 45 years old.

**Table 1.** Demographic Information

Characteristic	Particular	Frequency	Percentage
<b>Location</b>	Dhaka	131	32.8
	Chittagong	20	5.0
	Barisal	4	1.0
	Khulna	21	5.3
	Mymensingh	11	2.8
	Rajshahi	200	50.0
	Sylhet	13	3.3
<b>Gender</b>	Male	115	28.7
	Female	285	71.3
<b>Occupation</b>	Healthcare Professional	75	18.8
	Banker	5	1.3
	Businessman	6	1.5
	Medical Student	126	31.5
	General Student	120	30.0
	Teacher	31	7.8
	Other	37	9.3
<b>Age</b>	Below 30	306	76.5
	30-45	82	20.5
	Above 45	12	3.0

### *COVID-19 Diagnosis, Recovery, and Medical Product Purchase*

Table 2 presents general information of the respondents related to COVID-19 diagnosis, recovery, and medical product purchase. The researchers found that 25.3% of the respondents were diagnosed as COVID-19 positive, 63.5% respondents were not diagnosed as COVID-19 positive, 11.3% of the respondents were not sure about whether they diagnosed as COVID-19 positive or not. Next, 31.3% of the respondents had recovered from COVID-19, 47% of the respondents had not recovered from COVID-19, and 21.8% of the respondents were not sure whether they recovered from COVID-19 or not. The researchers also found 74.5% of the respondents bought medicine during this pandemic and 25.5% of the respondents did not buy any medicine during COVID-19.

**Table 2.** COVID-19 Diagnosis, Recovery, and Medical Product Purchase

Question	Particular	Frequency	Percentage
Did you or your close family member were diagnosed as COVID-19 positive?	Yes	101	25.3
	No	254	63.5
	Not Sure	45	11.3
Are you or your family members recovered from COVID-19?	Yes	125	31.3
	No	188	47.0
	Not Sure	87	21.8
Did you buy any medicine during this epidemic?	Yes	298	74.5
	No	102	25.5

Table 3 presents the results of multiple regression analysis. All coefficients were significant at 10% level confident interval. However, POPE and CRP were highly significant at 0.001 confident interval.

**Table 3.** Regression Analysis

Coefficient	Estimate	Standard Error	<i>t</i> value	Pr (>  t )
<b>Intercept</b>	0.41782	0.18752	0.03749	4.113*
<b>POPE</b>	0.69609	0.03457	20.137	< 2e-16***
<b>POHCF</b>	0.05552	0.03269	1.698	0.0902
<b>CRP</b>	0.15421	0.03749	4.113	4.69e-05***

\* $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## Discussion

The objective of this study is to investigate the impact of POPE, POHCF, and rising food prices on the impact of COVID-19. The study predicts that there is positive impact of POPE, POHCF, and rising food prices on the impact of COVID-19. In other words, it is hypothesized that the increase of the POPE, POHCF, and rising food prices will increase the impact of COVID-19. The following paragraph explains the result of the multiple regressions.

Under estimate, there are intercept ( $b_0$ ) and the beta coefficient estimates associated to each predictor variable. Standard error indicates the standard error of the coefficient estimates. Standard error estimates the variability/accuracy of the beta coefficients. In the model, the standard error of the coefficients is small indicating higher confidence in the regression coefficients. The  $t$  value refers to the  $t$ -statistic, which is the coefficient estimate divided by the standard error of the estimate. The  $t$ -statistic (and its associated  $p$ -value) evaluates whether there is a statistically significant relationship between a given predictor and the outcome variable; that is, whether the beta coefficient of the independent variable is highly different from zero. The null hypothesis being tested is that the coefficients are equal to zero (no relationship between IC and POPE for instance). Table 3 shows the null hypothesis is rejected for all predictors as  $p$ -value is less than significance level of .1. The higher the  $t$ -statistic (with lower the  $p$ -value), the more significant the independent variable. The symbols to the right visually indicate the level of significance.

Residual standard error of the model is .5874 on 423 degrees of freedom. It indicates the average difference between the observed outcome values and the predicted values by the model (Kassambara, 2018). In the model residual standard error is .5874 meaning that the observed IC value deviates from the predicted values by approximately .5874 units in average. Multiple  $R^2$

indicates the proportion of information/variation in the data that can be explained by the model. In the model multiple  $R^2$  is .5439. This means the model explains 54.4% of variation in dependent variable. The model has  $F$ -statistic: 168.1 on 3 and 423  $DF$ ,  $p < 2.2e-16$ . The  $F$ -statistic indicates the overall significance of the model. It evaluates whether at least one predictor variable has a non-zero coefficient. The test is highly significant indicating that the coefficient is different from zero. The variance explained is still low. This indicates there are other factors affecting the impact of COVID-19 that are not identified in the model.

As the model is validated, coefficients of the regression can now be interpreted. The coefficient of POPE is .69609. It is positive and statistically significant at  $p < .001$ . This means there is a positive significant impact of POPE on IC. An increase by one unit of POPE will increase by .69609 the IC. The first hypothesis that there is positive impact of POPE on the impact of COVID-19 is therefore supported. The coefficient of POHCF is .05552. It is positive and statistically significant at 10% confident interval. This means there is a positive significant impact of POHCF on IC. An increase by one unit of POHCF will increase by .05552 the IC. The second hypothesis that there is positive impact of POHCF on the impact of COVID-19 is therefore supported. The coefficient of CRP is .15421. It is positive and statistically significant at  $p < .001$ . This means there is a positive a significant impact of CRP on IC. An increase by one unit of CRP will increase by .15421 the IC. The third hypothesis that there is positive impact of rising food prices on the impact of COVID-19 is also supported.

The results of this paper demonstrate how each variable increases the consequences of COVID-19. It has been demonstrated that increasing prices of protective equipment, POHCF, and rising food prices will increase the impact of COVID-19. The findings are consistent with the current literatures. The healthcare system of Bangladesh was already burdened with large number of patients, lack of hospital beds, critical care facilities, and a shortage of healthcare professionals; and COVID-19 is making additional trouble for this over-burdened system (Anwar et al., 2020). Lack of test kits, admission difficulties in hospitals, shortages of skilled professionals, and inadequate protective equipment have all been observed during this crucial time (Jahangir, 2020). This situation increases the number of contaminations and deaths. Moreover, high prices of daily goods, medicine, and protective equipment including facemasks and medical devices are putting the whole healthcare system in jeopardy (Grimm, 2020; Haque et al., 2020). As Bangladesh has adopted an out-of-pocket expenditure model for payment of healthcare, the increased tendency of rising direct and indirect medical costs will deny access to healthcare for all citizens (Rahman et al., 2020).

## **Conclusions**

COVID-19 is now an emergency for whole world, and it has been influencing every sector of the people's daily life. This situation has many negative impacts on the economy. It is influencing the health economic sector in many countries. The price levels of general and emergency commodities are now increasing gradually. Due to this situation, people have been suffering a lot. Many people are facing difficulties buying medical equipment because of increased price levels. In this study, the researchers examined the impact of the coronavirus on rising price levels of healthcare commodities. The objectives of this study were threefold: (a) investigating the impact of POPE on the impact of COVID-19; (b) examining the impact of POHCF on the impact of COVID-19; and (c) analyzing the impact of rising food prices on the impact of COVID-19.

The study also supported three hypotheses:

- There is positive impact of price of protective equipment on the impact of COVID-19.
- There is positive impact of price of healthcare facility on the impact of COVID-19,
- There is positive impact of rising food price on the impact of COVID-19.

This study was conducted using a conceptual framework. The researchers showed the impact of the rising POPE, POHCF, and rising food prices on the impact of COVID-19. All the independent variables used in this study have positive and significant impact on the dependent variables. The regression analysis revealed that all independent variables had significant relationship between the dependent variables. Increasing prices of protective equipment, POHCF, and consequences of rising price level had significant relationship with the impact of COVID-19. Increasing POPE, POHCF, and rising food prices increase the impact of COVID-19. However, the variance explained was still low (54.4%). This indicates there are other factors affecting the impact of COVID-19 that are not identified in the model.

The coefficients of POPE, POHCF were positive and significant relationship that mean increasing price of POPE and POHCF will increase the impact of COVID-19. The finding leads the validation of the first and second hypothesis and the first and second hypothesis are supported. The coefficient of consequences of the rising price level and COVID-19 (CRP) was positive and statistically significant. This means there was a positive a significant impact of CRP on the impact on COVID-19. An increase of CRP will increase the IC. The third hypothesis expecting a positive impact of rising food prices on the impact of COVID-19 is confirmed.

### ***Theoretical Implications***

Theoretical implications of this study are threefold. First, this study showed factors increasing the impact of COVID-19 in different divisions of Bangladesh (Dhaka, Chittagong, Barisal, Khulna, Mymensingh, Rajshahi, and Sylhet). This study showed that an increase in protective equipment (POPE) increases the impact of COVID-19. Second, it demonstrated that increasing POHCF also increases the impact of COVID-19. Third, the study found that consequences of the rising price levels and COVID-19 (CRP) increase the impact on COVID-19. This study has contributed to understanding how an increase in analyzed goods increases the impact of COVID-19. Asier (2021) stated COVID-19 might have a long-term negative effect on the trade of goods and services that depend on the movement of people. Due to the pandemic, the rising price levels of various products are known in Bangladesh. This study found the impact of COVID-19 could increase the price of medical equipment, POHCF, which is important to protect people from COVID-19, and the consequences of the rising prices are badly affecting the people of Bangladesh. No prior study has been conducted about rising price levels due to the coronavirus.

### ***Practical Implications***

The results of this study have practical implications for the government of Bangladesh and stakeholders engaged in fighting COVID-19. The government of Bangladesh should look upon the entire sector of the pharmaceutical industry to control the price of medical commodities because there are many dishonest businesspeople who sell products at high prices for their own benefits. Moreover, the Bangladesh government should create funds for healthcare professionals.

Healthcare professionals are now taking higher workloads compared to before, the coronavirus period. Hospital authorities should provide the best facilities to healthcare professionals and minimize the costs of admissions and diagnostic tests for patients. Because many people are living below the poverty line in Bangladesh and due to the COVID-19 situation, many people have already lost their jobs. Sometimes these people are unable to bear hospital costs. Hospital authorities can import test kits, personal protective equipment, and other medical devices from other developed countries with the help of the government.

### ***Limitations and Future Research***

The first limitation of the study is the generalization of the findings. This study analyzed factors to find to what extent they were related to the impact of COVID-19. The regression result found a positive and significant impact on dependent and independent variables. The variance explained still low (54.4%). There may be other factors than POPE, POHCF, CRP, and IC that may affect the impact of COVID-19 not included in our model. On the other hand, collecting data during this pandemic is not easy. Collecting more data may increase the variance explained and could provide a better understanding of the factors related to the impact of COVID-19. Further research with more sampling and sophisticated tests could produce better results for this study. Further researchers should conduct studies to find other variables that increase the impact of COVID-19. The sample size used is small in terms of population of divisions of Bangladesh (Dhaka, Chittagong, Barisal, Khulna, Mymensingh, Rajshahi, and Sylhet). Future studies should also extend this study by including more samples from all divisions to get more generalizable results.

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