

## THE IMPACT OF PERSONAL PRODUCTIVITY DUE TO THE ATTACKS OF CORONAVIRUS DISEASE 2019: USING PARTIAL LEAST STRUCTURAL EQUATION MODEL

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### ABSTRACT

Global coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first identified in December 2019 in Wuhan, the capital of China's Hubei Province, and has since spread globally, resulting in the ongoing 2019–2020 coronavirus pandemic that has an impact which would be disturbed the personal productivity in the community. The dependent variable which is threat of COVID-19 (Thr\_Cov-19), vulnerability of COVID-19 (Vul\_Cov-19), and the unexpected change in society factors and one independent variable that is personal disturbance factors is used in this paper. Moreover, using as an indicator which will determine disturbance of personal productivity (D\_PP) in the society. Since multiple regression by partial least square-structural equation modeling is used to examined of data by following unstructured method. Moreover, the resulting point out three dependent variables significantly influences on the independent variable of personal productivity in the society. As a matter of fact, this study concludes the foremost influence factor on D\_PP in society due to COVID-19 risk factors such as Thr\_Cov-19, Vul\_Cov-19, and unexpected changed in the society factors. This study contributes to introductory study but vibrant understanding in stimulating the prediction of personal productivity in the society due to the COVID-19 attacks.

**Keywords:** Coronavirus disease, Threat of COVID-19, Vulnerability of COVID-19, Unexpected changed in the society, Personal productivity.

### INTRODUCTION

The common symptoms of coronavirus disease 2019 (COVID-19) include fever, cough, and shortness of breath. Other symptoms may include fatigue, muscle pain diarrhea, sore throat, loss of smell, and abdominal pain. While the majority of cases result in mild symptoms, some progress to viral pneumonia and multiorgan failure. As of April 6, 2020, more than 1,270,000 cases of have been reported in more than 200 countries and territories, resulting in more than 69,500 deaths. More than 264,000 people have recovered. The increasing amount of COVID-19 cases in the society also resulting the effect of the personal productivity [1].

As of April 11, 2020, more than 1.71 million cases have been reported in more than 200 countries and territories, resulting in more than 103,000 deaths. More than 388,000 people have recovered. The virus is mainly spread between people during close contact, often through small droplets produced during coughing, sneezing, or talking [2].

While these droplets are produced when breathing out, they usually fall to the ground or surfaces rather than being infectious over large distances. People may also become infected by touching a contaminated surface and then their face. The virus can survive on surfaces for up to 72 h [3].

Coronavirus is most contagious during the first 3 days after onset of symptoms, although spread may be possible before symptoms appear and in later stages of the disease. The COVID-19 outbreak is still evolving globally and remains a Public Health Emergency of International Concern [4]. Like many other member states around the world, Bangladesh is preparing to respond to additional cases and possible widespread transmission of the disease [3]. As cases of COVID-19 continue to climb, public concern in Bangladesh regarding the severity of the disease and population vulnerability of COVID-19 (Vul\_Cov-19) is also growing. Hence, the threat of COVID-19 (Thr\_Cov-19) variable occurred when most people who develop COVID-19 and seek medical attention will not be tested for it, at least not early on, because of the shortage of testing kits and confusion around where to send people who are showing symptoms [3].

Whereas the theory of COVID-19 attacks in showing the disturbance of personal productivity (D\_PP) variable such as creative activity. However, the internet connection all over the world may cause the vulnerability of the people, sometimes people get wrong information. Since the coronavirus has incited a lot of change across the world, these last couple months. It is also indicated the variable of unexpected change in society due to COVID-19 attacks (Unxch\_Cov-19). Entire cities have shut down, trains and airfare have all but nearly stopped, public spaces are shut down, concerts cancelled, and ski resorts closed [5].

### LITERATURE REVIEW

In this section, analyzing of theory of personal productivity due to COVID-19 virus attacks in the society and literature related to hypothesis which would be development and discussed.

#### Theory of D\_PP

In this article, it is shown that three constructs which are related with personal productivity due to COVID-19 attacks having the D\_PP in the society. The theory of D\_PP is the independent variable. While scrolling on social media amid the COVID-19 pandemic, may have noticed the push for less productivity. Many researchers found out that most people tend to curate themselves and could not put their best self on social activities. Seeing the mistakes and the flubs and the errors. Seeing what people want the world to see about them [6].

Hence, it is really important right now for people to realize that this is new for everyone. There is no road map on how to manage a pandemic. Thus, the following risk factors caused D\_PP factors that play a significance role in measure toward the personal disturbance of productive in the society [5].

#### The Thr\_Cov-19

The Thr\_Cov-19 factors is indicating that not all who are infected develop symptoms, but their role in transmission is unknown. Preliminary evidence suggests asymptomatic cases may contribute to the spread of the disease. The proportion of infected people who do not display symptoms is currently unknown and being studied, with

the Korea Centers for Disease Control and Prevention (CDC) reporting that 20% of all confirmed cases remained asymptomatic during their hospital stay. China's National Health Commission began including asymptomatic cases in its daily cases on April 1, of the 166 infections on that day, 130 (78%) were asymptomatic [7]. In the perspective of D\_PP due to the attack of COVID-19, the Thr\_Cov-19 factors is salience due to those infected with the virus may be asymptomatic or develop flu-like symptoms, including fever, cough, fatigue, and shortness of breath. Emergency symptoms include difficulty breathing, persistent chest pain or pressure, confusion, difficulty waking, and bluish face or lips, immediate medical attention is advised if these symptoms are present. Thus, the following hypothesis is developing H1: Thr\_Cov-19 factors that play a significance role in disturbing toward the Unxch\_Cov-19.

#### The Vul\_Cov-19

The Vul\_Cov-19 is about how the disease spreading is still being determined. The WHO and the US CDC say that it is primarily spread during close contact and by small droplets produced when people cough, sneeze, or talk, with close contact being within 1–3 m (3 ft 3 in–9 ft 10 in). The virus was present in most patient's saliva in quantities reaching 100 million virus strands per 1 mL. Even it is found that an uncovered cough can lead to droplets travelling up to 4.5 meters (15 feet) [8]. During the 2020 pandemic, found that advice on the distance droplets could travel might be based on old 1930s research which ignored the protective effect and speed of the warm moist outbreath surrounding the droplets [9]. Researcher found that an uncovered cough or sneeze can travel up to 8.2 meters (27 feet). Thus, the following hypothesis is developing H<sub>2</sub>: Vul\_Cov-19 factors that play a significance role in disturbing toward the Unxch\_Cov-19.

#### The Unxch\_Cov-19

Actually preventive measures to reduce the chances of infection include staying at home, avoiding crowded places, washing hands with soap and water often and for at least 20 s, practicing good respiratory hygiene, and avoiding touching the eyes, nose, or mouth with unwashed hands and nose with a tissue when coughing or sneezing and recommend using the inside of the elbow if no tissue is available. Also recommend proper hand hygiene after any cough or sneeze. Social distance strategies aim to reduce contact of infected persons with large groups by closing schools and workplaces, restricting travel, and cancelling large public gatherings [9]. Distancing guidelines also include that people stay at least 6 feet (1.8 m) apart. Thus, the following hypothesis is developing H<sub>3</sub>: The Unxch\_Cov-19 factors that play a significance role in disturbing toward the personal productive in the society.

## METHODOLOGY

In this section, the methodology of the research is discussed. In addition, the research conceptual framework in introduced and unstructured secondary data collected and data analyzed to find out the impact of personal disturbance of productivity due to COVID-19 attacks in the society.

### Conceptual framework

A conceptual framework of personal disturbance of productivity due to COVID-19 attacks in the society that synthesis from various literatures on how to explain a phenomenon. It maps out the actions required in the course of the study given the knowledge of relationship of hypothesis that points of view and observations on the subject of the study. Conceptual framework of personal disturbance of productivity due to COVID-19 attacks is a term that is widely used but poorly understood. In general, there is a delay between the moment when a person is infected with the virus and the time when they develop symptoms. This is called the incubation period [9]. The incubation period for COVID-19 is typically 5–6 days but may range from 2 to 14 days. Hence, 97.5% of people who develop symptoms will do so within 11.5 days of infection. People are managed with supportive care, which may include fluid therapy, oxygen support, and supporting other affected vital organs. The CDC recommends that those who suspect they carry the virus wear a simple face mask. Extracorporeal membrane oxygenation has been used to address the issue of respiratory failure, but its benefits are still under consideration. The reason, the conceptual framework of system consists of concepts, assumptions, expectations, beliefs, and theories that support and inform the researcher [10] (Fig. 1).

### Sample characteristics

In the sample collection section, using unstructured methods and among total 87 questionnaire were 39 returned, so 44% response rate. A Shapiro–Wilk test ( $p > 0.05$ ) and a visual inspection of their histogram, normal Q. However, Q plots and box plots showed that for the research article. In that case, the Thr\_Cov-19, the Unxch\_Cov-19, and theory of D\_PP were approximately normally distributed, with a skewness of 0.373 (standard error = 0.361) and a kurtosis of 0.583 (standard error = 0.716) [11].

### Results and data analysis

To test the hypothesis, a non-parametric structural equation modeling by partial least square (PLS) analysis is done for the personal disturbance of productivity due to COVID-19 attacks in the society. It is seen that PLS is a suitable approach to find out the impact value. Some medical professionals recommend paracetamol (acetaminophen)

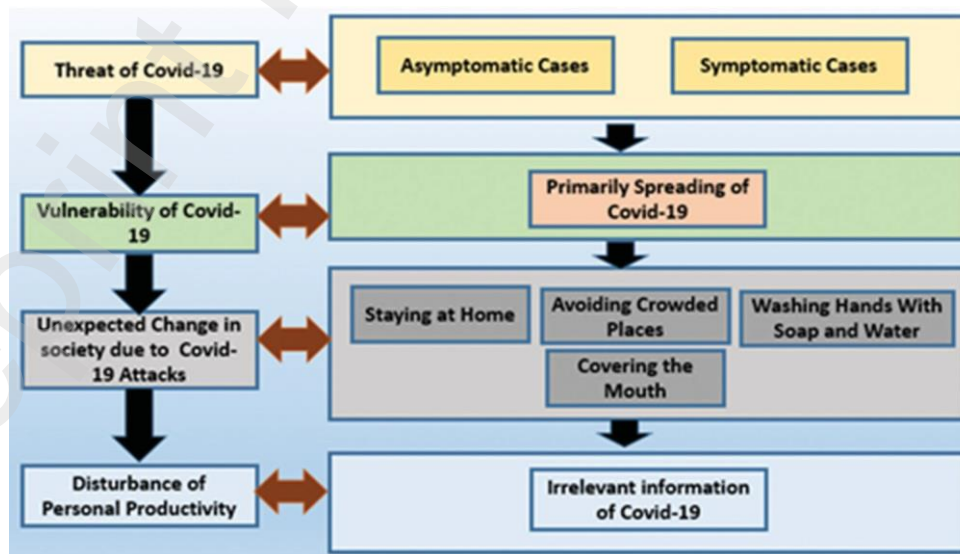


Fig. 1: Conceptual framework of personal disturbance of productivity due to COVID-19 attacks in the society

over ibuprofen for first-line use. The WHO does not oppose the use of nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen for symptoms, and currently, there is no evidence that NSAIDs worsen COVID-19 symptoms. And impact showing when this factor variable may effect in the society and how much disturbance might feel when due to COVID-19 attacks [11].

### Measurement analysis

Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity are used to access the factor sample adequacy for analysis. The value of KMO must be greater or equal to 0.6. In this study, the KMO result is considered a good as it is achieved 0.863. While Bartlett's test of sphericity is showing the high significant value ( $p < 0.001$ ) (Wiebke, 2009). Later, variable factors analysis is employed to test the discriminant validity of the items. In the Thr\_Cov-19 variable, there are six factors (Thr\_Cov-19\_1, Thr\_Cov-19\_2, Thr\_Cov-19\_3, Thr\_Cov-19\_4, Thr\_Cov-19\_5, and Thr\_Cov-19\_6). For the Vul\_Cov-19 possess five factors (Vul\_Cov-19\_1, Vul\_Cov-19\_2, Vul\_Cov-19\_3, Vul\_Cov-19\_4, and Vul\_Cov-19\_5).

The Unxch\_Cov-19 is four factors (Unxch\_Cov-19\_1, Unxch\_Cov-19\_2, Unxch\_Cov-19\_3, and Unxch\_Cov-19\_4). Moreover, the variable D\_PP possesses four factors (D\_PP\_1, D\_PP\_2, D\_PP\_3, and D\_PP\_4). Questionnaire was designed according to the factors name.

When unstructured methods were followed and tried to find out the impact.

But from the factor analysis (Thr\_Cov-19\_2, Thr\_Cov-19\_4, Vul\_Cov-19\_3, Vul\_Cov-19\_5, Unxch\_Cov-19\_1) has been removed due to the low factor loading ( $< 0.6$ ). Furthermore, the assessment of convergent validity has assessed the value of average variance extracted (AVE) of the variable such as Thr\_Cov-19, Vul\_Cov-19, and the Unxch\_Cov-19 factors. The value of AVE must be above than 0.5. The result in Table 1 demonstrates that convergent validity is satisfied with the threshold value. In addition, to access the discriminant validity, the square root of AVE must be greater than interconstruct correlation (Lowry *et al.*, 2014). The result of discriminant validity is shown in Table 2 which is diagonal value represents the square root of AVE. As a final composite reliability (CR) and Cronbach's alpha coefficient are used to assess reliability, as shown in Table 1, the CR value of 0.8, and the Cronbach's alpha is  $> 0.7$ . This result shows that the reliability of construct is reliable (Fig. 2).

### PATH MODEL ASSESSMENT

It is valid to access the multicollinearity issue in the model. As shown in Table 3, VIF value between construct is less than the threshold value (5.0). The value shown in Table 3 demonstrates that the multicollinearity issue is not happening in the model. The result of path assessment is shown in Table 3. The bootstrap technique was done to test the significance of the model.

A sub-sample of 500 is used with 0.05 significance level. The value for path coefficient result as shown in Fig. 3 and Table 3 indicates that the

**Table 1: The Cronbach's alpha, CR, and AVE values**

Coronavirus disease 2019 (COVID-19) attacking risk variables	Cronbach's alpha	CR	AVE
Threat of COVID-19 (Thr_Cov-19)	0.885	0.928	0.812
vulnerability of COVID-19 (Vul_Cov-19)	0.723	0.843	0.663
Unexpected change in society due to COVID-19 attacks (Unxch_Cov-19)	0.810	0.922	0.707
Disturbance of personal productivity (D_PP)	0.665	0.732	0.694

**Table 2: KMO and Bartlett's test of sphericity**

KMO measure adequacy sampling	0.0862
Bartlett's test of approximately. Chi-square	937.88
Sphericity	DE
	171
	Sig
	0.000

relationship the Unxch\_Cov-19. The study expresses a positive and direct impact on countermeasure to D\_PP toward the Vul\_Cov-19 ( $p < 0.001$ ). This result indicates that threat value of the system plays a significance role in determining the D\_PP in the society [12]. In addition, in the path model, all variable factors are connected to D\_PP. Since coronaviruses are a group of related viruses that cause diseases in mammals and birds. In humans, coronaviruses cause respiratory tract infections that can range from mild to lethal. Mild illnesses include some cases of the common cold (which has other possible causes, predominantly rhinoviruses), while more lethal varieties can cause SARS, MERS, and COVID-19. Finally, there is a direct influence between the variable factors toward the D\_PP. Since the impact is 0.584, which is showing the moderate effect happening in the case any due to COVID-19 attacks in the society. As a final point, the coefficient determination R squared value for a dependent variable which is the D\_PP is 58% where  $p < 0.001$ . This endogenous construct manifests a high level of capturing variance which means that it is well predicted by exogenous constructs.

### DISCUSSION AND CONCLUSION

The world faces a severe and acute public health emergency due to the ongoing COVID-19 global pandemic. Hence, the theory of personal productivity has been shown and to investigate the D\_PP due to coronavirus disease 2019 (COVID-19) attacking risks such as Thr\_Cov-19, Vul\_Cov-19, and Unxch\_Cov-19 factor. For analysis and verification, multiple linear regression analysis was used. Thr\_Cov-19 factors value, Vul\_Cov-19 factors value, and Unxch\_Cov-19 factors are the dependent variable which is affected by independent variable disturbance impact of personal productivity (D\_PP) variable. The coronavirus outbreak is first and foremost a human tragedy, affecting hundreds of thousands of people. It is also having a growing impact on the global economy. The COVID-19 outbreak affects all segments of the population and is particularly detrimental to members of social groups in the most vulnerable situations, continues to affect populations, including people living in poverty situations, older persons, persons with disabilities, youth, and indigenous peoples. Early evidence indicates that the health and economic impacts of the virus are being borne disproportionately by poor people. The virus is primarily spread between people during close contact often through small droplets produced by coughing, sneezing, or talking. While these droplets are produced when breathing out, they usually fall to the ground or onto surfaces rather than being infectious over long distances. People may also become infected by touching a contaminated surface and then touching their eyes, nose, or mouth. The virus can survive on surfaces for up to 72 h. It is most contagious during the first 3 days after the onset of symptoms, although spread may be possible before symptoms appear and in later stages of the disease [17]. Thr\_Cov-19 factors value has a significant impact on D\_PP. The virus is primarily spread between people during close contact often through small droplets produced by coughing, sneezing, or talking. While these droplets are produced when breathing out, they usually fall to the ground or onto surfaces rather than being infectious over long distances. The vulnerability part occurred when people become infected by touching a contaminated surface and then touching their eyes, nose, or mouth. The virus can survive on surfaces for up to 72 h. It is most contagious during the first 3 days after the onset of symptoms, although spread may be possible before symptoms appear and in later stages of the disease.

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### AUTHORS' CONTRIBUTIONS

All the authors had equal contribution on this study. Task was separated to all authors according to their expertise on specific topic. Dr. Shirin Afroz generated the research topic for this study and reviewed relevant literatures. Dr. Shekh Abdullah-Al-Musa Ahmed and Dr. Nik Zulkarnaen



Table 3: Discriminate validity

	Disturbance impact of personal productivity (D_PP)	Threat of COVID-19 (Thr_Cov-19)	vulnerability of COVID-19 (Vul_Cov-19)	Unexpected change in society due to COVID-19 attacks (Unxch_Cov-19)
Disturbance impact of personal productivity (D_PP)	0.745	0.623		
Threat of COVID-19 (Thr_Cov-19)	0.645	0.572	0.712	
vulnerability of COVID-19 (Vul_Cov-19)	0.823	0.661	0.622	
Unexpected change in society due to COVID-19 attacks (Unxch_Cov-19)	0.732	0.639	0.526	

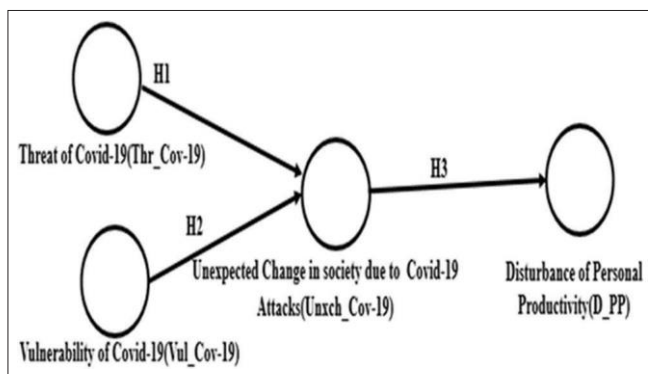


Fig. 2: The hypothesis relationship of the risk factors of disturbance of personal productivity due to COVID-19 attacks in the society

Bin Khidzir were the designer for the study. He designed methodology and analysis plan for the study and analyzed all the outcomes of the study and they also contributed on overall write up.

#### COMPETING INTEREST

Authors declare that they have no competing interest.

#### FUNDING

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