

ISSN: 2706-8471 (Online)

ISSN: 2706-8463 (Print)

Asian Journal of
**SUSTAINABLE
BUSINESS
RESEARCH**



**THE INFLUENTIAL FACTORS OF COVID-19 PANDEMIC ON PANIC BUYING: A
CASE FROM BANGLADESH**

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To cite the article: *Hasna Binte Hafiz, Fahmida Ferdous Mouri, Md. Salim Hussain (2025). THE INFLUENTIAL FACTORS OF COVID-19 PANDEMIC ON PANIC BUYING: A CASE FROM BANGLADESH, 3(1):43-64.*

Link to this article: <https://aiipub.com/journals/ajsbr-251026-10007/>

Article QR



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THE INFLUENTIAL FACTORS OF COVID-19 PANDEMIC ON PANIC BUYING: A CASE FROM BANGLADESH

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ARTICLE INFO

Article Type: Research

Received: 03 Sep. 2025.

Accepted: 23 Oct. 2025.

Published: 02 Nov. 2025.

Keywords:

Panic Buying, COVID-19, Rumors, Fear and Anxiety, Health Security, Price Hike and Shortage of Supply, Economic system.

ABSTRACT

Panic buying is a behavioral phenomenon characterized by a sudden increase in the purchase and consumption of essential goods due to an undesirable situation, resulting in a mismatch between the available supply and the demand. An abrupt surge in the volume of purchases indicates panic buying, typically leading to a price escalation of the goods or security. The primary aims of this study were to ascertain the factors contributing to panic buying during the COVID-19 epidemic in Bangladesh and to examine the repercussions of such behavior during this era. This study conducted an empirical analysis to investigate the influence of the COVID-19 pandemic on panic buying in Bangladesh. A systematic questionnaire and survey were used to collect data from a total of 420 individuals across Bangladesh. The investigation's outcomes and the validity of our model were determined utilizing the SEM (Structural Equation Model) technique through the utilization of SmartPLS-3. The estimation results indicate that the outbreak of the COVID-19 pandemic, along with rumors, fear, and anxiety, health security, and the economic system, had a 44.3% impact on panic buying. Panic buying, in turn, had a 27.2% positive impact on price hikes and a 33.4% impact on supply shortages during the COVID-19 pandemic in Bangladesh. In summary, our research revealed that the COVID-19 pandemic led to widespread anxiety among individuals regarding their future circumstances. This, in turn, resulted in a surge in panic buying, accompanied by increased prices and stockpiling of supplies. This study aims to provide a comprehensive and accurate explanation of the factors that lead to panic buying during the COVID-19 epidemic, which has not been done before. The research findings will serve as a crucial resource for policymakers, medical experts, business sectors, health sectors, export-import sectors, marketing departments, and government

authorities. These findings will aid in formulating policies to mitigate panic buying during the pandemic and in devising post-COVID-19 plans.

1. INTRODUCTION

The COVID-19 pandemic has severely impacted the worldwide economic and healthcare systems, causing widespread dread, terror, and uncertainty among billions of individuals. Survival psychology recognizes that individuals might experience behavioral changes after significant events like natural catastrophes and disease outbreaks, which can disrupt social life and pose health risks (Forbes, 2017). Panic buying is a behavioral change where customers purchase abnormally large quantities of things in anticipation of a disaster, anticipated disaster, significant price spike, or shortage. Global panic buying has been documented in response to the COVID-19 epidemic, as well as in previous big disasters or health emergencies. With the implementation of lockdown and quarantine measures in many areas, panic buying has become a prominent characteristic of the Coronavirus outbreak. Store shelves were completely emptied in all locations. Toiletries, frozen meals, rice, beans, eggs, and breads are frequently in high demand and quickly sell out as buyers engage in impulsive and obsessive buying to build up their supplies (Mahedi et al., 2025). The exceptionally transmissible and potentially lethal COVID-19 undermined people's sense of authority.

The occurrence of panic shopping has become a worldwide phenomenon, indicating the lack of restraint among consumers during the period of the Coronavirus lockdown. Panic buying is a collective activity that is socially undesirable, characterized by the purchase of significant amounts of essential goods and medical supplies from markets, often leading to shortages in stock. During the COVID-19 pandemic, certain persons or groups who are more vulnerable are unable to get the things they need due to limitations or restrictions (Wessler, 2019). This resulted in the occurrence of detrimental externalities inside communities. Furthermore, the act of panic buying exacerbated the disruptions to supply networks. The intermittent increase in consumer product demand, along with route closures or traffic restrictions, presented difficulties in areas such as ordering, restocking, and distribution. As a result, this worsened instances of supply shortages and frequently resulted in higher prices for consumer goods and product scarcity.

Panic buying is a lesser-studied aspect of consumer behavior study, characterized by impaired purchase decisions influenced by emotions such as fear, anxiety, social influences, rumors, health concerns, and economic factors. Nevertheless, despite the significance of the subject, the existing comprehension of panic buying is somewhat restricted. A query on Google Scholar for scholarly works specifically addressing panic buying in their title, abstract, or keywords returned a limited number of direct results. Moreover, among these studies, only a limited number have specifically investigated the underlying factors contributing to panic buying. The majority of the discussions regarding the origins of panic buying were very recent and were triggered by the COVID-19 pandemic. Due to limited resources, the authors of the study collected data exclusively from four countries: the United States, China, India, and Pakistan (Islam T. P., Panic buying in the COVID-19 pandemic: A multi-country examination, 2021). In a further study, the authors restricted their investigation to Italian Twitter users that employ a certain hashtag (Barnes, 2021). Other authors exclusively examined media narratives that cannot be deemed as dependable sources of information (Arafat S. Y.-M., Panic buying: An insight from the content analysis of media reports during COVID-19 pandemic, 2020). Based on the aforementioned data, this study contends that it is

necessary to synthesize the limited and dispersed literature on panic buying. The primary aims of this study were to "determine the factors contributing to panic buying and assess the repercussions of panic buying during the COVID-19 pandemic in Bangladesh." This study aimed to offer a comprehensive and up-to-date analysis and evaluation of panic buying. It also proposed a research agenda for future investigations and suggest interventions or policy recommendations to reduce the occurrence of panic buying. The primary findings of this study indicated that panic buying can be attributed to rumors, fear and anxiety, health security, and the economic system. Within the context of the perception theme, the perceived threat of COVID-19 outbreaks rumors, fear and anxiety, concerns about health security, and the vulnerability of the economic system serve as driving forces behind panic buying. This, in turn, led to an increase in prices and a shortage of supplies. The present study had made numerous noteworthy contributions to the existing body of literature. Initially, this investigation was carried out during the COVID-19 pandemic. During the data collection period, a significant number of individuals, amounting to billions, were subjected to an unparalleled lockdown and house quarantine. This study was conducted using a natural experiment setting and offers a timely examination of customer behavior during a crisis in real-time. Furthermore, it formulated a hypothesis by analyzing pertinent scholarly articles, conference papers, and newspaper stories obtained through search engines. Subsequently, the Structural Equation Model (SEM) is employed to analyze the original data, which is then measured and arranged into themes. These themes were subsequently explored separately. The consequences and recommendations presented in this study will greatly assist future research endeavors.

1.1 Objectives of the Study

On the backdrop and discussion, this study was led by the following objectives:

- a) Identifying the causes of panic buying during the period of the COVID-19 pandemic in Bangladesh and
- b) Analyzing the consequences of panic buying during the period of the COVID-19 pandemic in Bangladesh.

1.2 Literature review

Panic buying, as defined by Oxford (2020), refers to the act of purchasing significant amounts of a certain good or commodity in response to sudden concerns about an imminent scarcity or price hike. Panic buying is a prevalent consumer response to disasters, typically observed when customers anticipate or experience a disaster or a perceived disaster (Li, 2020). Annually, in numerous locations worldwide, law enforcement officials, in collaboration with news organizations, caution those residing in areas prone to seasonal natural catastrophes against engaging in panic buying (Arafat S. M.-M., 2020). Panic buying, a prevalent consumer behavior, has not been well studied by experts, and the existing research on this topic lacks definitive conclusions. According to Islam T. P. (2021), several researchers have contended that customers bear responsibility for purchasing needed things prematurely, resulting in higher pricing, depleted stock, and lengthy queues at stores.

Nevertheless, previous researchers have discovered that customers exhibit few signs of terror either before or during the onset of natural disasters (Handmer, 1999). Furthermore, instances of panic are limited to a small subset of individuals and tend to dissipate quickly (Perry, 2003).

Despite research indicating that panic buying leads to disruptions in the supply of specific products, experts in the business field and scholars have argued that panic buying is not driven by a shortage of

supplies, but rather by heightened anxiety and fear among consumers (Shou, 2013). Essentially, this anxiety and fear might be attributed to the belief that there is a limited amount of time and resources available. Additionally, this process is self-perpetuating: as customers make impulsive and obsessive purchases, the scarcity of things will cause individuals to feel greater anxiety, leading to a faster depletion of available items. Previous studies suggested that panic buying is mostly triggered by the disruption of the supply of products and services, which can be caused by natural disasters, pandemics, and prolonged strikes (Badgaiyan, 2015). The scarcity of time and quantity among the inhabitants led to worry and dread, which in turn resulted in impulsive and obsessive purchases in response to these stimuli.

1.2.1 Rumors and Their Relationship with Panic Buying

The rapid expansion of social media platforms and widespread use of smartphones have enabled billions of individuals to share and publish a wide range of content on popular platforms such as Facebook, Twitter, WeChat, and Instagram (Tahir Islam, 2020; Parsons, 2014). Extensive business studies have demonstrated that the utilization of social media has a substantial impact on the decision-making process of consumers and also stimulates shifts in customer preferences (Barger, 2016).

During the COVID-19 lockdowns, social media platforms offered users the ability to quickly access and exchange information, as well as establish and sustain connections. Unsurprisingly, social media usage experienced a significant surge during these exceptional circumstances. Every day, social media platforms were inundated with millions of posts discussing the Coronavirus. Occasionally, the veracity of pictures and videos depicting vacant shelves varied. The incessant repetition of news on social media generates social rumors and exacerbates terror and fear among users (Lins, 2020). Occasionally, their expectations turned out to be incorrect, leading to the spread of rumors among consumers. Thus, in the midst of the COVID-19 epidemic, the overuse of social media, the spread of incorrect information on social media, and changes in consumer behavior have led to the circulation of rumors. These rumors can potentially amplify the impact of external stimuli on people's perceived arousal. This study posits that there is a correlation between rumors and panic buying during the COVID-19 pandemic.

H1: There existed a significant relationship between rumors and panic buying; during COVID-19, the higher the level of rumors, fear, and anxiety spread, the stronger the relationship.

1.2.2 Fear and Anxiety and their relationship with panic buying

Typically, individuals would undergo emotional turmoil, including feelings of fear and anxiety, during a disease outbreak (Choi, 2019). The anguish mostly arises from humans' incapacity to forecast the consequences of an outbreak, which undermines their control over nature (Sterman, 2015). The fear of the unknown is exacerbated by the absence of information on a health crisis or sickness. The adoption of self-protective measures to mitigate the danger during the epidemic, along with the perception of product scarcity leading to a sense of helplessness in controlling the situation, and concerns for the well-being of family members within the COVID-19 pandemic, contribute to heightened levels of fear and anxiety. The situation generates ambiguity, leading individuals to engage in repetitive thinking and envision various possibilities, ultimately triggering feelings of fear and anxiety.

The correlation between fear and anxiety and heightened purchasing behavior can also be elucidated by mood congruency. Larson (2018) suggests that when experiencing negative emotions or stress, an individual's perception and evaluation of unrelated situations or occurrences are biased in a negative direction. Increased fear and anxiety amplify individuals' perception of risk and threat in a given

setting (Hutjens, 2014; Slovic, 2006), prompting them to adopt extreme actions in response to a significant occurrence like a disease epidemic. Therefore, as shown in this section, fear and anxiety can lead to panic buying during the COVID-19 pandemic, which is seen as a way to protect oneself and reduce the danger.

H2: There existed a significant relationship between fear and anxiety, and panic buying; during COVID-19, the higher the level of fear and anxiety, the stronger the relationship.

1.2.3 Health Security and Its Relationship with Panic Buying

The phenomenon of panic buying has emerged as a prominent feature of the COVID-19 pandemic. The global impact of this phenomenon poses a significant challenge to health systems in their efforts to effectively prevent and treat the coronavirus, as essential supplies are scarce such as hand sanitizers, masks, and pain medications (Islam T. I., 2021). The panic-driven purchase of putative remedies has also caused a shortage of medications for patients with chronic illnesses. Chloroquine and hydroxychloroquine, although untested for COVID-19, are crucial medications for autoimmune ailments like lupus (Besson, 2020). Nations worldwide were endeavoring to procure masks, protective gear, and ventilators, while also accumulating and limiting other medications in order to address disruptions in the supply chain. Suppliers are seeing a significant increase in demand, which is causing them to be excessively burdened. Additionally, raw materials are scarce, leading to an escalation in costs. Furthermore, there is an unprecedented level of political pressure.

According to S. Y. Arafat et al. (2020), people's purchasing habits were influenced by their perception of health crises and associated events or entities. The consistent guidance from health professionals to accumulate essential health products, along with reports of a worsening COVID-19 pandemic, may contribute to heightened uncertainty and subsequently lead to panic buying (Yuen, 2020). The COVID-19 epidemic highlights the significance of international information exchange, particularly regarding the availability and pricing of products, as well as the presence of deceitful producers. Based on the discussion, the study proposes that individual behavior aimed at safeguarding health during the COVID-19 pandemic leads to changes in purchasing behavior of health-related products, resulting in panic buying.

H3: There existed a significant relationship between health security and panic buying; during COVID-19, the higher the level of health security arises the stronger the relationship.

1.2.4 Economic System and Its Relationship with Panic Buying

Amidst the COVID-19 epidemic, the cost of everyday goods rises, and there are shortages due to the implementation of lockdown measures. During the lockdown period, numerous critical and crucial products saw a disruption in their distribution to the market compared to pre-lockdown times. This circumstance has generated ambiguity over the product's availability, thereby altering individuals' purchasing patterns and leading to increased buying quantities (Mahedi et al., 2025). This excessive purchasing trend (Dulam, 2020) had adverse consequences on supply chains and warehouses. The COVID-19 pandemic has demonstrated that even the most effective and streamlined supply chains can be vulnerable to consumer panic purchasing (Dulam, 2020).

H4: There existed a significant relationship between the failure of economic systems and panic buying; during COVID-19, the higher the economic systems failed, the stronger the relationship.

1.2.5 Price Hike and Shortage of Supply and Their Relationship with Panic Buying

Hoarding behavior by customers, characterized by the purchase of abnormally large quantities of a product before or during a crisis or anticipated disaster like COVID-19, leads to price hikes and market shortages (Islam, Pitafi, et al., 2021). The preceding discourse has already demonstrated that

rumors, fear and anxiety, health security concerns, and economic system failure have the capacity to alter consumer purchasing behavior, so inciting panic buying. This panic buying, in turn, leads to price inflation and supply shortages. Increased consumer purchasing leads to a decrease in the equilibrium between supply and demand (Parmar, 2020). According to Islam et al. (2021), certain researchers have contended that customers bear responsibility for purchasing needed commodities prematurely, resulting in escalated pricing, depleted stock, and lengthy queues at stores. Based on the general debate, the study hypothesis suggests that panic buying during the COVID-19 pandemic leads to price hikes and supply shortages.

During the COVID-19 pandemic, economic systems are hindered by import and export restrictions, preventing production companies from importing raw materials as they did previously (S. Y. Arafat et al., 2020). Despite the increased demand for the product in the market, the provider was unable to meet the supply. The suppliers' syndicate deliberately manufactured an artificial shortage, which in turn had a significant impact on customers' purchasing behavior. During this period, there was a widespread scarcity of products, and the implementation of lockdowns and quarantines further disrupted the regular functioning of the economy. This led to a sense of ambiguity in consumer purchasing patterns, resulting in increased consumer demand compared to previous levels. Based on the debate, the study postulates that the collapse of the economic system alters customers' purchasing behavior, leading to panic buying as a means to mitigate risk during the COVID-19 pandemic.

H5: There existed a significant relationship between panic buying and price hike; during COVID-19, the higher the panic buying arises the stronger the relationship.

H6: There existed a significant relationship between panic buying and shortage of supply; during COVID-19, the higher the panic buying arises, the stronger the relationship.

During the execution of this study, many countries were at different phases of the pandemic. China, the country where the pandemic originated, appeared to have effectively managed the epidemic, while the United States was nearing the highest point of the outbreak. This exceptional circumstance yielded valuable and intriguing observations regarding the varying consumer behaviors during different phases of a crisis and their involvement in distinct patterns of panic buying. These findings have significant implications for businesses and policy-makers, enabling them to enhance their response to the crisis on a global level. This study analyzed the present state of research, which it provided a summary, classification, and expansion of the prevailing conceptual knowledge regarding the factors that contribute to panic buying. The review of the literature showed that the causes of panic buying can be categorized into four main themes/factors: (1) Rumors, (2) Fear and anxiety, (3) Health security, (4) Economic system. Those factors trigger panic buying, and that results in (1) a price hike, (2) a shortage of supply. The implications and recommendations that are provided in this study will be very helpful in future research.

2. METHODS

The COVID-19 pandemic provides a natural field experiment setting for this study. The data were collected during the peak of the pandemic when government lockdowns were enforced in almost all countries, affecting more than 7 billion people around the world. People were facing uncertainty never before and engaging in panic buying of various products because of rumors, fear, and anxiety, and in fear of a shortage. During the COVID-19 pandemic, people all over the world were facing social rumors, fear, and anxiety, and the health sector was in a vulnerable situation. The economic system also failed because of lockdown and quarantine, and the export-import barriers. Those factors also

affected Bangladesh, and many people were anxious about the COVID-19 pandemic. Those factors influenced people to panic-buy in Bangladesh, also. Bangladesh is a developing country with vulnerable retail and supply chain systems. Hence, people were very much worried about the availability of products during the pandemic, and this influenced them to trigger the panic buying.

2.1 Proposed Research Model

In order to establish the conceptual framework and formulate hypotheses, it is necessary to conduct a comprehensive study of articles, journal papers, and conference papers, with the aim of finding the variables and theories that elucidate the phenomenon of panic buying. Initially, the keywords included in each journal publication were discovered and subsequently compiled into a list. Based on the available information, identify any research gaps that have not been addressed in the journals and papers. This text encompasses the causes that instigated panic buying during the COVID-19 pandemic. The utilization of focus groups, which involves the facilitation of questions and the stimulation of debate among a collective of individuals, was crucial in the development of this model and the formulation of corresponding hypotheses.

The study utilized the Structural Equation Model (SEM) technique with the aid of SmartPLS-3. Initially, the instruments underwent rigorous testing to ensure their reliability and validity. Furthermore, the stated hypotheses were tested using SEM analysis. Partial Least Squares (PLS) route modeling is a reliable technique used in management research to estimate intricate cause-effect connection models (Hair J. F., 2013). PLS-SEM analysis is capable of efficiently deriving solutions for intricate models, namely those that involve numerous constructs, indicators, and structural linkages (Hair Jr, 2021). Partial Least Squares Structural Equation Modeling (PLS-SEM) is well-suited for the initial stages of theory building and testing, as it allows for the analysis of components and interactions inside intricate structural models (Hair H. R., 2016). This statement accurately describes the correlation between panic purchasing and the elements that contribute to panic buying during the COVID-19 pandemic. It also highlights the connection between panic buying and both price increases and supply shortages.

PLS-SEM is not dependent on a large sample size and effectively handles complex models without making assumptions about the data distributions. According to the guidelines of PLS-SEM, the recommended sample size is ten times the number of arrows directed towards a construct (Hair Jr, 2021). PLS-SEM is highly suited for the current investigation.

2.2 Population and sampling design of the study

Bangladesh was selected as the location for data collection. Data were gathered from a total of 420 participants across Bangladesh for the purpose of conducting the study. The selection primarily relied on the magnitude of COVID-19, which prompted widespread panic purchasing. Specifically, in Bangladesh, the epidemic began and caused significant casualties during the initial phase of COVID-19. Bangladesh was indeed impacted by the COVID-19 pandemic, leading to a surge in panic buying, which became a prominent subject of discussion. Furthermore, Bangladesh is a developing nation with a susceptible retail and supply chain infrastructures. In regions with a high corruption rate and widespread distrust of institutions, such as panic buying has become a common manifestation of deviant behavior. Therefore, examining the purchasing habits of consumers during times of panic in Bangladesh will offer a thorough and inclusive understanding of this issue on a global scale.

2.3 Sources of data:

The online survey approach was utilized as the primary data source to assess the suggested conceptual model and hypotheses. The online survey approach was deemed suitable for this study due to the prevailing lockdown and quarantine measures, which limited access to consumers exclusively through online platforms. Furthermore, previous marketing literature has demonstrated that surveys are an appropriate means of examining customers' behavior. A total of 420 participants from various regions of Bangladesh were included in the data collection process. During a period of intense panic and worry. This study fulfills the requirements of a genuine experimental research design, as the participants are genuinely experiencing a state of terror as a result of the epidemic. In addition, some data were collected by;

- Face-to-face conversation with the consumers.
- Direct observation.
- Focus groups (asking questions and generating discussion among a group of people).
- Distributing questionnaires with open-ended questions.

Along with the survey to do the study properly, the author reviewed the articles, journal papers, and identified factors and theories as secondary sources that explain panic buying. First, the keywords found in each journal paper were identified and listed. Those journals and articles helped to set the proposed model, hypothesize, and the literature review of the study.

2.4 Scaling technique:

The study employed a five-point Likert scale to elicit the participants' replies. The respondents emphasized the point that best represents how they would characterize the product being graded. Participants were instructed to assess their level of concurrence or discordance using a five-point Likert scale that spanned from strongly disagree to strongly agree. Prior to finishing the questionnaire, a pretest was conducted on a sample of 20 respondents.

2.5 Nature of data and time horizon of data:

The study was conducted on the basis of primary data that were collected from 420 participants all over Bangladesh, distributing questionnaires with open-ended questions. Most of the data were collected from online questionnaire surveys, and some of them were collected by distributing questionnaires directly. The data were collected during the months of March and April in 2021. That was the peak time of the pandemic, and panic buying occurred because of rumors, fear and anxiety, failure of economic systems, and for vulnerable health systems.

3. RESULTS

This study was conducted to identify the causes of panic buying and to analyze the consequences of panic buying during the period of the COVID-19 pandemic in Bangladesh. This study was designed based on the Panic Scale 2021. In this study the causes of panic buying that were shown was categorized into four main themes/factors (1) Rumors=H1, (2) Fear and anxiety=H2, (3) Health security=H3, (4) Economic system=H4. Those factors trigger panic buying and that results in (1) price hike=H5, (2) shortage of supply=H6. The findings provided information regarding the causes of panic buying and the consequences of panic buying during the period of COVID-19 pandemic in Bangladesh. The finding was unique through structural equation model, because it introduced and validated the measurement and structural model. Theoretically, this model would help the

policymakers, government agencies, and researchers, since this study confirmed that all dimensions have a significant impact on panic buying and panic buying triggers the price hike and shortage of supply.

Specifically, HA ($\beta = 0.322$) had the strongest significant impact factor for PB during the COVID-19 pandemic. That meant during the COVID-19 perceived health security motivated people to buy more. When the pandemic was peak, health-related products were not found properly and timely manner because of quarantine, lockdown, and export-import barriers. The government also failed to supply the necessary medicines for the people. All those factors created an uncertain situation about the future and health crisis at that time, and so people buy more and more health-related products for future needs and which results in panic buying. During the peak of COVID-19, to buy more products, the price of products increased, and the suppliers were unable to supply the products.

Whereas the R ($\beta = 0.117$) had the lowest impact on PB, and the other two factors that triggered panic buying are ES ($\beta = 0.164$) and FA ($\beta = 0.195$), had a significant impact on PB during COVID-19 in Bangladesh. And PB ($\beta = 0.521$) on PH and PB ($\beta = 0.594$) on SS. R, FA, HS, ES had a positive significant impact on panic buying during the COVID-19 pandemic, and PB (panic buying) had a positive significant impact on PH (price hike) and SS (shortage of supply during the COVID-19 pandemic in Bangladesh. That indicated that rumors, fear, and anxiety, the failure of the economic system (export-import barriers, quarantine, lockdown, poor transportation systems) created an uncertain situation about the future availability of the necessary products during the COVID-19 period, and all of them together or separately motivated people to buy more than they needed. And so panic buying occurred frequently during the peak of the COVID-19 pandemic, and that created a price hike and supply shortage. This study examined that rumors, fear and anxiety, health security, and economic system all together have a 44.2 percent impact on panic buying, and panic buying had a 27.1 percent positive impact on price hike and 35.3 percent on shortage of supply during the COVID-19 pandemic in Bangladesh.

4. DISCUSSIONS

This study analyzed the present state of research, which it provided a summary, classification, and further development of the current conceptual knowledge of the factors that contribute to panic buying. The literature evaluation of this study revealed that the causes of panic buying may be classified into four primary themes/factors: rumors, fear and anxiety, health security, and economic system. These circumstances precipitated panic purchasing, leading to an increase in prices and a scarcity of supplies. It unified the fragmented and sparse literature and categorized it into many themes/factors. The study utilized the Structural Equation Model (SEM) approach employing SmartPLS-3. Prior to conducting the study, the instruments underwent rigorous testing to ensure their reliability and validity. Furthermore, the stated hypotheses were tested using SEM analysis. Furthermore, this study integrates several aspects into the model, establishing stronger academic links between panic buying and the wider body of literature concerning the origins and repercussions of panic buying. Additionally, it succinctly outlines and elucidates the variables employed in previous studies and offers recommendations for prospective researchers in selecting the methodology for their own investigation. A structural equation model is used to determine the relationships between several constructs in this study. The hypotheses were evaluated by employing a structural model once the reliability and validity of the constructs were confirmed. The PLS method and bootstrapping were employed to evaluate the path coefficients and t-values to determine the associations between 'rumor, fear and anxiety, health security, economic system' and panic buying, as well as the relationship

between panic buying and 'price hike and scarcity of supply.

5. CONCLUSION

The global COVID-19 pandemic has significantly disturbed the mental well-being of individuals worldwide. The current COVID-19 epidemic has resulted in a widespread occurrence of panic buying in several nations, causing an increase in prices, shortages of goods, and interruptions in the supply chain. As a result, panic buying has garnered significant interest from scholars, the retail business, healthcare sectors, market researchers, and government authorities. They want to determine the underlying reasons for panic buying and its subsequent effects.

A systematic questionnaire was designed based on seven distinct scales about 'Panic buying during COVID-19' (Aquino, 2), and the survey data were collected for this study. A comprehensive review of the relevant literature was performed. The review posited that panic buying is driven by rumors, fear, anxiety, health security concerns, and the state of the economic system. The perceived menace of the COVID-19 epidemic, fueled by rumors, fear, and anxiety, as well as concerns about health security and the fragile economic system, prompts individuals to engage in panic buying. This behavior subsequently leads to a price hike and a shortage of supply.

The study's empirical findings indicate that the COVID-19 pandemic has led to rumors, fear, and anxiety, health security concerns, and disruptions in the economic system. These factors have had a significant impact of 44.3 percent on panic buying. Additionally, panic buying has had a positive impact of 27.2 percent on price hikes and 35.4 percent on supply shortages during the pandemic in Bangladesh. As a consequence of the COVID-19 epidemic, individuals are experiencing heightened anxiety about their future circumstances, leading to panic buying. This, in turn, has caused an increase in prices and a shortage of supplies.

Nevertheless, this study had various constraints. COVID-19 is a global epidemic that is impacting every country worldwide. Regrettably, obtaining a bigger sample size proved unattainable. Given the constraints of limited resources, the data for this study were exclusively gathered from Bangladesh. Subsequent investigations could corroborate the results by including additional nations that were not accounted for in this study. Furthermore, in the current study, data were gathered via an online questionnaire survey approach as a result of the lockdown and home quarantine circumstances imposed by the pandemic. Data were acquired through direct methods and the use of focus groups. Subsequent investigations could utilize alternative methodologies, such as conducting experiments, in order to broaden the range of data sources. Furthermore, once the pandemic reaches its highest point and begins to decline in many nations, supermarkets and government authorities will have a more advantageous position to furnish accurate information regarding consumers' impulsive and obsessive purchasing. Furthermore, in order to maintain a straightforward model, this study exclusively focused on four components as the precursors of perceived arousal, which consequently trigger panic purchasing. The consequences of panic buying are then manifested in two factors: price hike and shortage of supply. Subsequent investigations should explore additional significant variables that could influence behavioral results, such as marketing cues, attributes, and motives, among other considerations.

These research findings will serve as a crucial resource for governments and medical experts to develop strategies in the aftermath of the COVID-19 epidemic. These results will have practical benefits for several sectors such as business, health, export-import, marketing, and government authorities. They can use these results to formulate policies aimed at preventing panic buying during

the pandemic. The sectors that are closely associated with the establishment and advancement of market stability. Furthermore, individuals should prioritize maintaining composure, vigilance, and mental stability while upholding social duty in order to mitigate panic purchasing within the ongoing pandemic. This study was an innovative endeavor that integrates the notions of panic buying causes and the repercussions of panic buying during a pandemic such as COVID-19. Furthermore, it will provide valuable assistance to future research in numerous aspects.

ACKNOWLEDGEMENTS

Acknowledged people/organizations should be limited to those who play a more important role in the task, research, and thesis completion.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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TABLES

1. Demographic Information

The demographic characteristics (**table 4.1.**) were shown here from the survey analyzed, 66.40% were male and 33.60% were female respondents. The majorities’ education levels of the respondents were graduates (45.00%) and the rest of them were HSC (22.10%), post graduates (19.80%) and SSC and bellow (13.10%). The majorities’ occupation were government service holder (28.50%) and the rest of them were private service holder (16.90%), business (13.40%), housewife (11.90%), teacher (11.90%) and farmer (7.60%) of the total respondent. The majorities’ income levels were less than BDT 10,000 (45.74%) and the rest of them were BDT 11,000-20,000 (15.71%), BDT 31,000-40,000 (9.52%), BDT 41,000-50,000 (8.33%), BDT 51,000-60,000 (4.04%), BDT 61,000-70,000 (1.19%) and 71,000-1,00,000 (1.67%).

Table 3.1: Demographic information

Demographic Information	Category	Frequency (N=420)	%
Gender	Male	279	66.40%
	Female	141	33.60%
Educational Qualification	SSC and Below	55	13.10%
	HSC	93	22.10%
	Graduate	189	45.00%
	Post-graduate & above	83	19.80%
Occupation	Govt. Service Holder	41	9.80%
	Private Service Holder	71	16.90%
	Teacher	50	11.90%
	Business	56	13.40%

Income Level	Farmer	32	7.60%
	Housewife	50	11.90%
	Others	120	28.50%
	0-10,000	193	45.74%
	11,000-20,000	66	15.71%
	21,000-30,000	58	13.80%
	31,000-40,000	39	9.52%
	41,000-50,000	35	8.33%
	51,000-60,000	17	4.04%
	61,000-70,000	5	1.19%
	71,000-above	7	1.67%

2. Measurement Model

The measurement model presented in **Table 3.2** and **Figure 3.1** was assessed by determining the indicator reliability, internal consistent reliability, convergent validity, and discriminant validity (Hair H. R., 2016). The reliability of the indicator was assessed by calculating the square of both the outer loading and its threshold, with a minimum requirement of 0.5 or greater (Hulland, 1999). The internal consistency reliability was assessed by assessing Cronbach's alpha, rho-A, and composite reliability, ensuring that the threshold value of 0.70 was met to achieve internal consistency (Joseph Hair, 1995). A construct's convergent validity can be considered satisfactory if its average variance extracted (AVE) value is equal to or greater than 0.50 (Hulland, 1999). During the evaluation of the measurement model, no items were excluded from the analysis due to having factor loadings below 0.600. Gefen, 2015 Straub, 2015 **Table 3.2** displayed the loading of indicators, the reliability of indicators, Cronbach's alpha, rho-A, composite reliability, and AVE. Therefore, the indicator loadings, Cronbach's alpha, rho-A, and composite reliability all above the threshold value of 0.70. According to the data, each of the constructions demonstrates reliability. In addition, **Table 3.2** presented the computed AVE ranges (0.579–0.701), which above the threshold value of 0.50 as defined by Hulland (1999). Therefore, this study has met the necessary conditions for convergent validity. The model demonstrates that 44.2 percent of the variation in panic buying over the COVID-19 period may be attributed to various factors. Specifically, 27.1 percent of the variance is explained by the relationship between panic buying and price hikes, while 35.3 percent is attributed to the connection between panic buying and supply shortages.

Table 3.2: Reliability and validity analysis

Constructs	Items	Indicators Loading	Indicators Reliability	α	rho_A	CR	AVE	RSquare
Rumors	R1	0.862	0.74	0.785	0.799	0.875	0.701	0
	R2	0.893	0.8					
	R3	0.75	0.56					
Fear and Anxiety	FA1	0.773	0.6	0.777	0.778	0.857	0.6	0
	FA2	0.779	0.61					
	FA3	0.814	0.66					
	FA4	0.731	0.53					
Health Security	HS1	0.804	0.65	0.71	0.732	0.838	0.633	0
	HS2	0.855	0.73					

	HS3	0.723	0.52					
Economic System	ES1	0.833	0.69	0.882	0.884	0.914	0.679	0
	ES2	0.833	0.69					
	ES3	0.812	0.66					
	ES4	0.822	0.68					
	ES5	0.818	0.67					
Panic Buying	PB1	0.71	0.5	0.879	0.886	0.906	0.579	0
	PB2	0.815	0.66					
	PB3	0.79	0.62					
	PB4	0.753	0.57					
	PB5	0.823	0.68					
	PB6	0.709	0.5					
	PB7	0.716	0.51					
Price Hike	PH1	0.769	0.59	0.837	0.841	0.885	0.607	0
	PH2	0.84	0.71					
	PH3	0.754	0.57					
	PH4	0.724	0.52					
	PH5	0.804	0.65					
Shortage of Supply	SS1	0.813	0.66	0.814	0.819	0.879	0.645	0
	SS2	0.868	0.75					
	SS3	0.716	0.51					
	SS4	0.808	0.65					
Panic Buying	PB	1	1					0.442
Price Hike	PH	1	1					0.271
Shortage of Supply	SS	1	1					0.353

Source: SmartPLS 3 and authors' own findings.

Notes: Composite Reliability = $(\sum \text{factor loading})^2 / (\sum \text{factor loading})^2 + \sum (\text{variance of error})$, AVE = $\sum (\text{factor loading})^2 / (\sum (\text{factor loading})^2 + R(\text{variance of error}))$. Here, α =Cronbach's Alpha, CR = Composite Reliability, AVE = average variance extracted, R= Rumors, FA= Fear and anxiety, HS= Health security, ES= Economic system, PB= Panic buying, PH= Price hike, SS= Shortage of supply.

3. Correlation Matrix

Table 3.3: Latent Constructs Correlation Matrix and Square Root of the AVE
(Fornell–Larcker criterion and heterotrait–monotrait ratio of correlations)

Constructs	R	FA	HS	ES	PB	PH	SS
R	0.837						
FA	0.448	0.778					
HS	0.544	0.57	0.796				
ES	0.548	0.568	0.652	0.824			
PB	0.47	0.525	0.604	0.549	0.761		
PH	0.494	0.574	0.624	0.65	0.521	0.779	
SS	0.518	0.652	0.642	0.706	0.594	0.715	0.803

Source: SmartPLS 3 Output. Abbreviations: R=Rumors, FA= Fear and anxiety, HS= Health security, ES= Economic system, PB= Panic buying, PH= Price hike, SS= Shortage of supply

Notes: Diagonal and Bold values are the square roots of the AVE. Below the diagonal elements are the correlations between the construct's values. Above the diagonal elements are the heterotrait–monotrait ratio of correlations values.

Abbreviations: R=Rumors, FA= Fear and anxiety, HS= Health security, ES= Economic system, PB= Panic buying, PH= Price hike, SS= Shortage of supply.

The discriminant validity was established by analyzing the correlation matrix, calculating the square root of the average variance extracted (AVE), and examining cross loadings. In order to achieve satisfactory discriminant validity, it is necessary for the square root of the average variance extracted (AVE) to be bigger than the correlation between its corresponding row and column (J Henseler C. R., 2009). Conversely, the external loading of a structure should be greater than its other associated loadings. The square root values of all the constructs in table 4.3 were found to be bigger than their corresponding correlations, thereby validating the discriminant validity of the data. The data's legitimacy has been confirmed and is now ready for further examination.

4. Discriminant Validity Analysis

Table 3.4: Cross Loading for Discriminant Validity Analysis

Constructor	R	FA	HS	ES	PB	PH	SS
R1	0.862	0.371	0.454	0.436	0.411	0.409	0.426
R2	0.893	0.381	0.47	0.48	0.422	0.418	0.448
R3	0.75	0.377	0.447	0.467	0.343	0.42	0.431
FA1	0.408	0.773	0.501	0.507	0.402	0.52	0.554
FA2	0.395	0.779	0.449	0.517	0.403	0.46	0.539
FA3	0.328	0.814	0.41	0.38	0.424	0.426	0.522
FA4	0.257	0.731	0.409	0.359	0.396	0.373	0.403
HS1	0.438	0.484	0.804	0.562	0.446	0.568	0.552
HS2	0.427	0.518	0.855	0.522	0.561	0.472	0.534
HS3	0.445	0.344	0.723	0.478	0.42	0.465	0.446
ES1	0.548	0.449	0.571	0.833	0.465	0.526	0.59
ES2	0.427	0.461	0.553	0.833	0.438	0.534	0.587
ES3	0.404	0.495	0.511	0.812	0.443	0.543	0.559
ES4	0.399	0.525	0.515	0.822	0.499	0.53	0.578
ES5	0.483	0.399	0.537	0.818	0.406	0.548	0.597
PB1	0.24	0.331	0.405	0.279	0.71	0.315	0.339
PB2	0.356	0.384	0.499	0.443	0.815	0.451	0.497
PB3	0.401	0.435	0.524	0.474	0.79	0.402	0.513
PB4	0.174	0.325	0.374	0.281	0.753	0.274	0.314
PB5	0.372	0.437	0.483	0.447	0.823	0.404	0.474
PB6	0.491	0.434	0.509	0.549	0.709	0.459	0.549
PB7	0.365	0.407	0.362	0.345	0.716	0.405	0.384
PH1	0.483	0.459	0.546	0.639	0.435	0.769	0.641

PH2	0.432	0.459	0.522	0.554	0.438	0.84	0.608
PH3	0.311	0.422	0.455	0.343	0.377	0.754	0.435
PH4	0.293	0.438	0.422	0.383	0.37	0.724	0.493
PH5	0.385	0.418	0.477	0.583	0.402	0.804	0.59
SS1	0.496	0.536	0.543	0.665	0.476	0.595	0.813
SS2	0.443	0.566	0.592	0.573	0.505	0.601	0.868
SS3	0.292	0.523	0.406	0.386	0.441	0.506	0.716
SS4	0.424	0.47	0.512	0.633	0.486	0.591	0.808

Source: SmartPLS 3 Output.

Abbreviations: R=Rumors, FA= Fear and anxiety, HS= Health security, ES= Economic system, PB= Panic buying, PH= Price hike, SS= Shortage of supply.

The calculated cross loading from **Table 3.4** exhibited that all outer loading is larger than its corresponding loadings. The calculated square root of AVE, which is shown here in details. The loading value of every constructs' square root of AVE differ by 0.10 and that is the minimum standard (Straub, 2015). So the validity of the data has been fulfilled and significant.

5. Heterotrait-Monotrait ratio

Table 3.5: Heterotrait-Monotrait Ratio (HTMT)

Constructs	R	FA	HS	ES	PB	PH	SS
R							
FA	0.577						
HS	0.738	0.76					
ES	0.664	0.684	0.827				
PB	0.54	0.625	0.741	0.597			
PH	0.607	0.711	0.813	0.748	0.591		
SS	0.649	0.821	0.841	0.831	0.682	0.861	

Source: SmartPLS 3 Output.

Abbreviations: R=Rumors, FA= Fear and anxiety, HS= Health security, ES= Economic system, PB= Panic buying, PH= Price hike, SS= Shortage of supply.

The component used to access the discriminant validity of the constructs is the Heterotrait Monotrait (HTMT) ratio procedure also. As indicated by (J Henseler C. R., 2015) to check for the discriminant validity, the most conservative threshold values of HTMT ratio was less than or equal to 0.90. In this study, all the values of HTMT were less than the threshold value of 0.90.

6. Hypothesis Testing (Structural equation model)

The study employed a structural equation model to determine the relationships between several constructs in this investigation. The hypotheses were evaluated by employing a structural model following the confirmation of the reliability and validity of the constructs. The PLS algorithm and bootstrapping were employed to evaluate the path coefficients and t-values at significance levels of 5% and 1%. Table 5 displayed the results on the relationship between construct variables. The findings showed that the relationship between **rumors** to panic buying ($t = 2.257$, $\beta = 0.177$, $p < 0.05$), **fear and anxiety** to panic buying ($t = 3.314$, $\beta = 0.195$, $p < 0.05$), **health security** to panic buying ($t = 5.313$, $\beta = 0.322$, $p < 0.001$), **economic system** to panic buying ($t = 2.516$, $\beta = 0.164$, $p < 0.05$), panic buying to **price hike** ($t = 8.46$, $\beta = 0.521$, $p < 0.001$), panic buying to **shortage of supply** ($t = 11.651$,

$\beta = 0.594$, $p < 0.001$) were found positive and significant. Thus, the entire hypotheses were found supported in this research. Furthermore, Figure 3.3 portrays the hypothesis testing among the constructs validation.

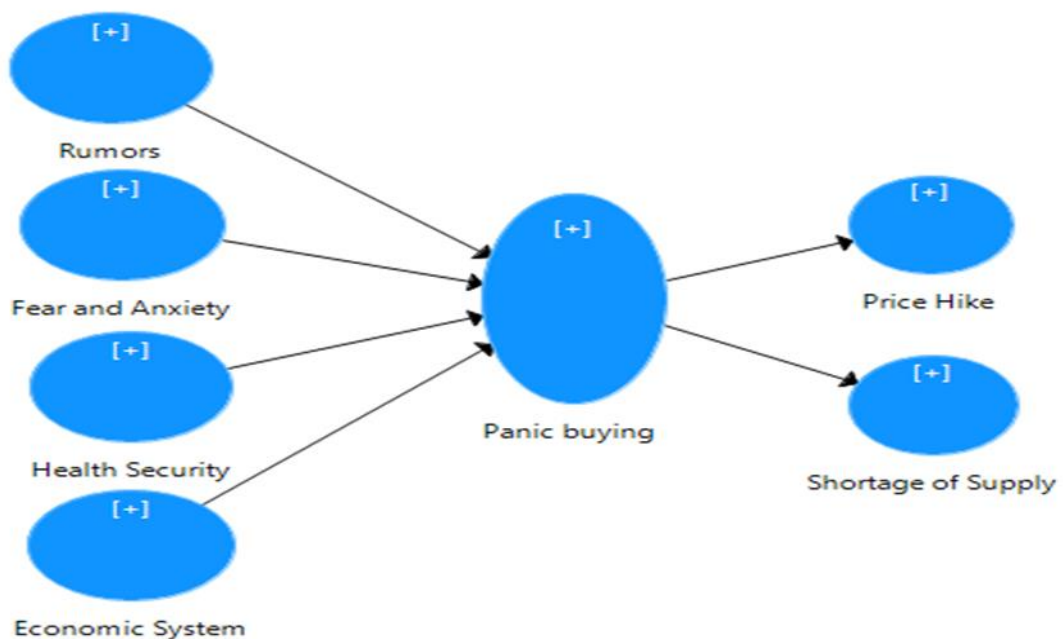
Table 3.6: Structural equation model

Hypothesis paths		β	Standard Deviation	T-Values	P Values	Decisions
H1	Rumors -> Panic Buying	0.117	0.052	2.257	0.024	Supported
H2	Fear and Anxiety -> panic Buying	0.195	0.059	3.314	0.001	Supported
H3	Health Security -> Panic Buying	0.322	0.061	5.313	0	Supported
H4	Economic System-> Panic Buying	0.164	0.065	2.516	0.012	Supported
H5	Panic Buying-> Panic Buying	0.521	0.062	8.46	0	Supported
H6	Panic Buying -> Panic Buying	0.594	0.051	11.651	0	Supported

Notes: **P-value < 0.01, *p-value < 0.05, **Source:** SmartPLS 3 Output.

FIGURES

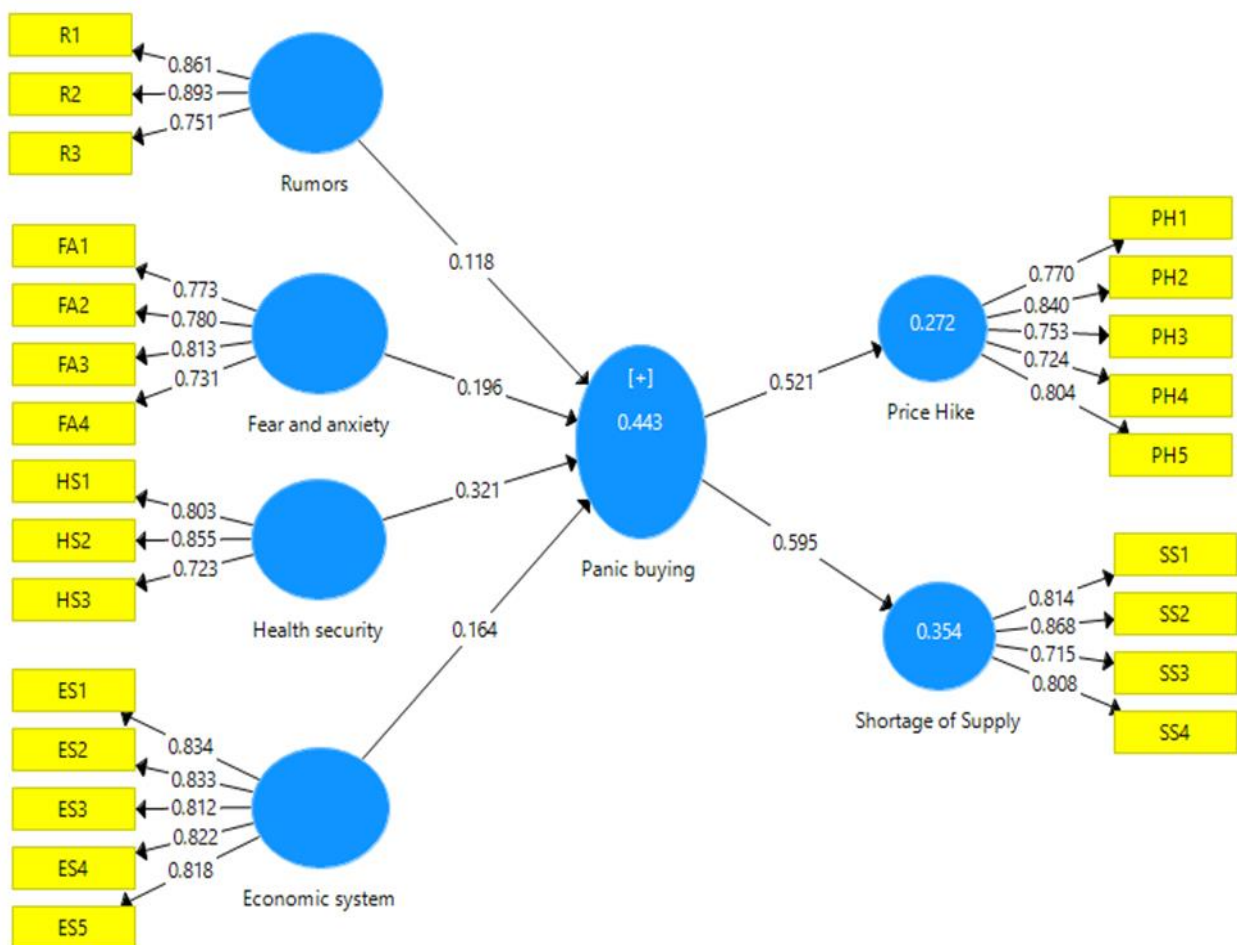
Figure 2.1: Proposed research model



This model was designed on the basis of panic scale (Lins, 2020) and the Structural Equation Modeling (SEM). This study examined the relationships between independent and dependent variables. The causes of selecting SEM, Variables can be continuous or discrete; measured variables can be observed and are measurable; latent variables cannot be observed directly, but their values can be implied by their relationships to the observed variables and more than two variables are measured to determine a value for a latent variable ((SEM), 2021).The structure implies statistical and often

causal relationships between variables (modeling, 2021). In this model it was shown the causes of panic buying that can be categorized into four main themes/factors (1) Rumors=H1, (2) Fear and anxiety=H2, (3) Health security=H3, (4) Economic system=H4. Those factors trigger panic buying and that results in (1) price hike=H5, (2) shortage of supply=H6. The study was conducted on the basis of the model and that is best fit on background of the previous literature reviews.

Figure 3.1: Proposed research model validation with Path Efficient



Source: SmartPLS 3 output

Figure 3.2: Heterotrait-Monotrait Ratio (HTMT)

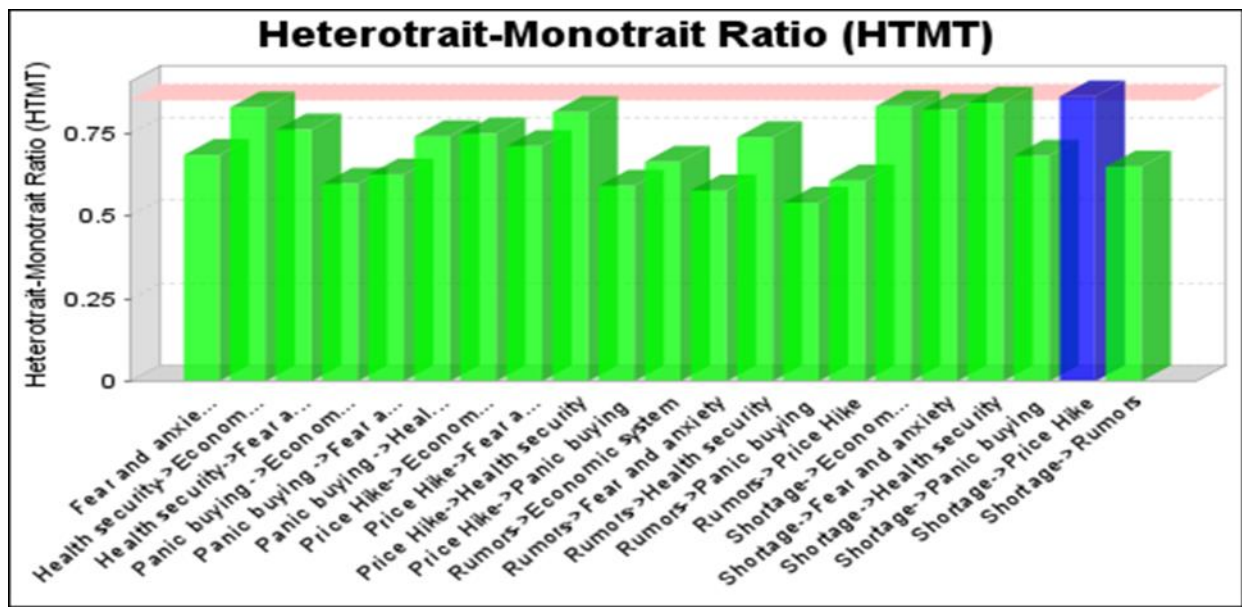
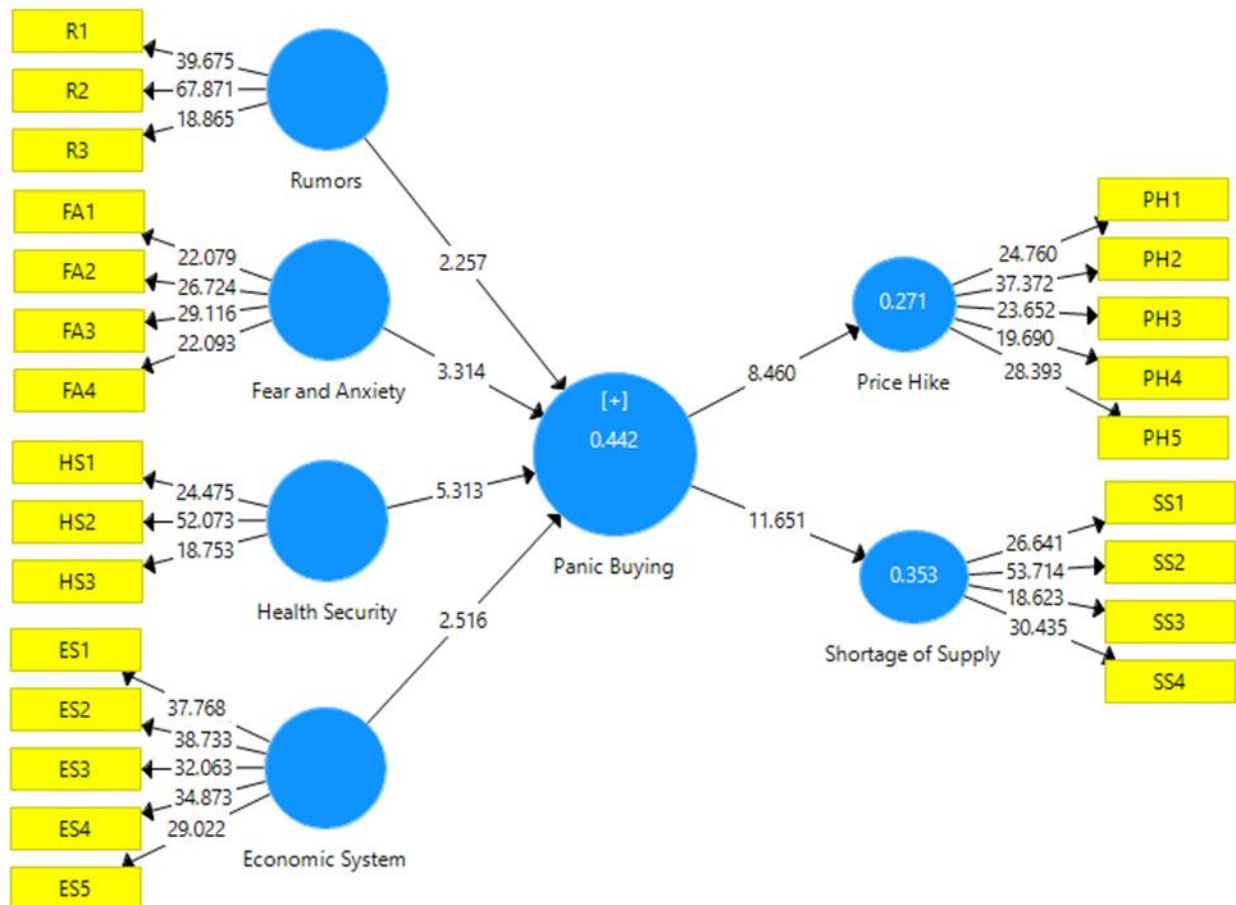


Figure 4.2 showed that Heterotrait-Monotrait Ratio (HTMT) graph in green colors except one. That means all the constructs' loading values with the other values variance didn't cross the actual standard limit of 0.85 except one. Only one constructs variance is 0.861(shortage supply-panic buying) and that also maintain the minimum standard threshold value less than 0.90 and that is acceptable said by (J Henseler C. R., 2015). Hence, the discriminant validity was fulfilled the significance and so for it was attained

Figure 3.3. Bootstrapping results of the proposed research model for hypothesis testing validation.



Source: SmartPLS 3 Output. Abbreviations: R=Rumors, FA= Fear and anxiety, HS= Health security, ES= Economic system, PB= Panic buying, PH= Price hike, SS= Shortage of supply.



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