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# Factors Causing Panic Purchasing Behavior during the COVID-19 Pandemic and Customer Satisfaction With Government Intervention as the Moderating Variable

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**Abstract:** It is essential to observe the phenomenon of panic buying during the COVID-19 pandemic. Additionally, research into panic buying spans multiple study fields, and deserves more consistent scientific attention. This study examines the factors of panic buying behavior using the theory of Maslow's hierarchy of needs to scrutinize panic buying behavior regarding consumer needs. Subsequently, this study investigates the moderating variable of government intervention to fill the research gap. Furthermore, this study looks for the effect on customer satisfaction that resulted from the panic buying behavior phenomenon. The data were collected from 456 grocery and drug store consumers in Indonesia, who shopped throughout the COVID-19 pandemic. PLS-SEM was used to analyze the data. The outcomes indicate that control, social media, perceived severity, and perceived scarcity significantly affect panic buying behavior. In contrast, government intervention only moderated the effect of social media on panic buying. Finally, the phenomenon of panic buying significantly affects customer satisfaction.

**Keywords:** panic buying behavior, perceived severity, perceived scarcity, government intervention, customer satisfaction.
**JEL Classification:** C12, M31, M3

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# Introduction

Panic buying refers to a behavioral phenomenon where people buy a product in massive quantities, in anticipation of supply problems due to a severe crisis or disaster (Tsao, Raj, and Yu, 2019). Ardyan et al. (2021) stated that the death rate due to the COVID-19 pandemic was very high in various countries. It affected over 220 million people, accounting for approximately 2.91% of the world's population (Ming and Jais, 2022). The increased mortality rate due to the COVID-19 pandemic coerced people to stay at home, as evidenced by the global "Stay at home" movement. Consequently, panic buying became a common phenomenon during this pandemic. Panic buying began when people felt frightened (Taylor, 2021) that there was large-scale buying worldwide. Sirletti et al. (2020) also mentioned that when people became nervous, this led to a lot of grocery shopping, especially for household needs, such as toilet paper, masks, hand sanitizer, food, and water.

That behavioral phenomenon also occurred in some metropolitan areas in Indonesia. Izzaty (2020), in Ardyan et al. (2021), explained that panic buying started when two COVID-19 patients were identified in March 2020, as announced by the Indonesian government. The occurrence of panic buying had a significant impact on the rise in Indonesian retail prices and other industries. Despite the significance of research into panic buying behavior, there still needs to be more academic studies in this field (Chua et al., 2021). According to Billore and Anisimova (2021), research into panic buying spans multiple fields of study. There needs to be a consistent effort to study this phenomenon, for the good of marketing and consumer studies. Billore and Anisimova (2021) argue that the structure of panic buying still needs to be put into practice, and needs more coherent academic attention to build new and more profound knowledge related to consumer behavior theories and frameworks.

The literature review conducted by Yuen et al. (2021) notes that the published research focuses primarily on the social and psychological stimuli of panic buying behavior, rather than the motivational needs of individuals while facing problems or threats. Therefore, this study aims to further the theoretical research into the panic buying of consumers. This study analyzes the relationship between panic buying and Maslow's hierarchy of needs theory.

The remaining sections of the study are structured as follows. Based on the relevant literature on Maslow's hierarchy of needs theory, a theoretical model is proposed to account for individuals' panic buying. The data collection, organization, illustration, and interpretation process are then discussed. Subsequently, the article will expound on the significant findings, highlighting their alignment with the Maslow's hierarchy of needs theory.

Moreover, practical consequences, for both theory and policy, are discussed, and the paper ends with suggestions for further study.

# Literature Review

## *The Theory of Maslow's Hierarchy of Needs*

This study uses the theory of Maslow's hierarchy of needs to explain the factors influencing consumer panic buying behavior. According to Maslow (1943), as seen in Figure 1, there are five levels of people's needs: physiological, security, social, esteem, and self-actualization. This study then classifies the perceived scarcity variable into physiological needs, the perceived severity variables into safety needs, the social media posts variables into social conditions, and the control variables into esteem needs. This research focuses on the four lowest levels of Maslow's hierarchy of needs theory (physiological, safety, social, and esteem) as these form the parts of the most essential and vital human needs (Yuen et al., 2021). During the pandemic, the mentioned needs were dispossessed and threatened. As such, in a dispossessed situation, people tend to move down the hierarchy of needs before acquiring the higher needs (Bob, 2009).

According to Maslow (1943), physiological needs are biological, and required to fulfill life's basic needs, such as oxygen, water, and food. Likewise, perceived scarcity refers to the perceived supply level of physical resources that are essential to an individual's normal functioning (Mehta and Zhu, 2016). Therefore, perceived scarcity can be classified under physiological needs.

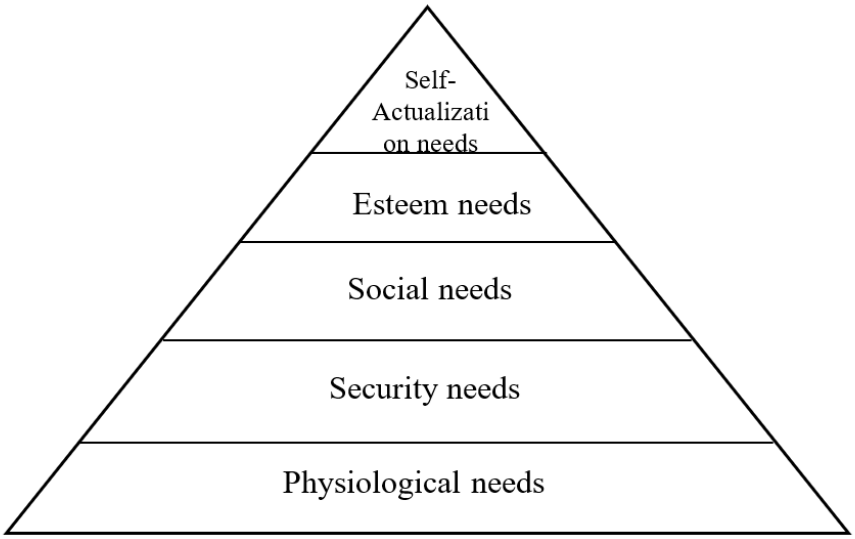
According to Maslow (1943), if people can adequately meet their physiological needs, a new category will emerge, known as security needs. Security needs also require maintenance throughout life, like physiological needs, which are more psychological (Bob, 2009). Perceived severity refers to the consequences of the adverse effects of the COVID-19 pandemic on individual well-being, such as job security and economic conditions, family relationships, and psychological health (Li et al., 2021). Perceived severity proposes that individuals are motivated to protect themselves when facing potential hazards from the environment, to improve their safety and well-being (Gellman, 2013). Thus, the perceived severity is relevant and appropriate to be classified under security needs.

After the security and physiological needs are fulfilled, Maslow stated that social needs and the feeling of belonging to a specific group are the third level of human needs. This includes giving and receiving affection, trust, friendship, acceptance, and intimacy. Maslow also mentions affiliation or being part of families, friends, and work as a social need. Maslow (1943) divides the demand for esteem into two categories. The first comprises a desire for self-sufficiency, accomplishment, power, independence, and freedom. The second is for status and renown (regard from others), attention, recognition, significance, or respect.

When these needs are fulfilled, individuals gain confidence and feel appreciated by society. However, when someone feels deprived, they will feel unvalued, weak, and powerless (Bob, 2009). This study uses social media as a component of social needs, because they contain elements of social relations to motivate one's behavior.

According to Maslow (1943), the last need is good self-actualization. This need refers to the desire for self-fulfillment, i.e., a person's tendency to fully optimize his/her potential. This inclination is described as the willingness to be more capable (Maslow, 1943). Multiple studies conducted by Lester et al. (1983) and Locke (1997) demonstrated that the accomplishment of control strengthens an individual's belief in their ability to control events, thereby boosting their self-confidence and morale and satisfying their esteem requirements. Since control significantly impacts an individual's self-esteem, it can be categorized under esteem needs.

**Figure 1**. Theory of Maslow's Hierarchy of Needs




*(Source: Maslow, 1943)*

## *Effect of Control on Panic-Buying Behavior*

Gabrys et al. (2018) refer to control as an individual's perceived ability to exercise control over negative invasive thoughts and emotions, and their ability to deal with traumatic situations. Yuen et al. (2021) stated that many circumstances, such as a pandemic, will undermine one's perception of control over one's environment. The reduced perception of control will create discomfort and anxiety, further motivating the individual to regain control. This is because the COVID-19 pandemic made many people feel helpless in many respects.

The compensatory control theory posits that people desire control over their situ-

ation by solving problems. Problem-solving increases one's confidence in regaining control over one's situation. Two conditions must be met for panic buying to be considered problem-solving to regain lost control (Andy and Chen, 2020). First, the action must be performed by the individual directly. Second, the act must be believed to attain an ideal state to re-establish control of a situation with diminished control. The first criterion is met because consumers routinely purchase products, such as daily necessities, while expending minimal financial or cognitive resources (deliberate action). The second criterion is also met because purchasing consumption goods is practical.

Although purchasing large quantities of consumer goods is maladaptive (Kennett-Hensel, Sneath and Lacey, 2012), because it does not help or may even worsen the shortage of supplies in the market, it gives individuals indirect control over their situation, as the majority of these goods can be used to mitigate the health crisis or used in the future. In conclusion, panic buying can be regarded as a compensatory consumption behavior, suggesting that individuals purchase products to compensate for deficits caused by perceived requirements and desires that can only be met indirectly (Koles, Wells, and Tadajewski, 2018). In this context, the deficit refers to losing control over the circumstance, which can be offset by problem-solving strategies such as panic purchasing. This is how the initial hypothesis was developed:

**H1:** Control negatively affects panic buying behavior.

### *Effect of Social Media Posts on Panic-Buying Behavior*

According to experts, social media make individuals more apprehensive about the future, which affects inventory levels (Reuters, 2020). Excessive posting of hoarding on social media by friends, family, and strangers can increase FOMO (Fear of Missing Out) and induce panic purchasing (Helmke et al., 2020). Based on the socially constructed meaning of COVID-19, consumer panic purchasing behavior increased globally, resulting in hoarding behavior (Naeem, 2021).

Social media posts are also pertinent to the crowd psychology theory, in which the frantic purchasing of necessities during a health crisis is characterized as "going with the flow" or "following the crowd" (Cheng, 2004). Stories about hoarding and images of empty shelves, disseminated by the media, may suggest that others are only concerned with themselves, inciting a desire to engage in the same behavior, such as hoarding. According to the crowd psychology theory, crowds can result in a loss of behavioral control, self-interest, and distraction (Drury, Novelli, and Stott, 2013). Observed shopping behavior in media communications, such as official news and social media, frequently indicate population behavior (Smith and Klemm, 2020). Consequently, consumers employ this social

proof heuristic to revise their beliefs about purchasing behavior regarding the quantity and frequency of purchases (Cao et al., 2020).

**H2:** Social media posts positively affect panic buying behavior.

### *The Perceived Severity's Effect on Panic Buying*

Fear, depression, anxiety, and stress have emerged as psychological risk factors for contracting COVID-19 due to the outbreak of the disease (Mamun et al., 2022). Dsouza et al. (2020) identify educational stress, unemployment, relationship issues, and poverty as common underlying causes of psychiatric disorders. In research about consumer behavior, experts have found that perceived severity can increase an individual's level of purchasing decisions, to eliminate negative emotions, including feelings of stress, discomfort, security, and fear (Sneath, Lacey, and Kennett-Hensel, 2009). Yuen et al. (2021) also found that a pandemic threatens an individual's needs in life, leading to increased fears. As a result, people feel anxious and panic buy. In a pandemic, individuals think about the threat of contracting the disease when the disease is spreading. This threat can trigger them to make panic purchases of safety products, to protect themselves from potential harm and take preventive measures. Therefore, the following hypothesis is presented.

**H3:** Perceived severity positively affects panic buying behavior.

### *The Effect of Perceived Scarcity on Panic Buying Behavior*

According to Yuen et al. (2020), perceived scarcity is connected to the reactance theory (Brehm and Brehm, 1981), which argues that if there is a threat to a person's freedom of behavior, the individual experiences psychological reactance. Psychological reactions are motivational states designed to retrieve an individual's freedom of action (Gupta and Gentry, 2019). Li et al. (2021) revealed that a feeling of losing the freedom to be involved in a specific behavior makes a person more willing to retrieve his/her liberty. In reality, necessities were crucial during the COVID-19 pandemic. It was also predicted that there would be shortages of goods within a short period. As such, there was a tendency for people to act on their panic buying behavior, due to the fear of resource insufficiency. The moment a person realizes the possibility of certain goods being inaccessible, he/she will think about excessive buying when the products are still available to maintain their freedom (Yuen et al., 2020). Under the phenomena mentioned above, the following hypothesis is presented.

**H4:** Perceived scarcity positively affects panic buying behavior.

### *The Moderating Role of Government Intervention*

According to Duan et al. (2020), government intervention is when the government advises or mandates that the public and private sectors take specific measures to limit the severity or spread of a pandemic's effects. As a precaution against the spread of the COVID-19 pandemic, the government implemented stringent health measures, such as social isolation and lockdowns (Dickins and Schalz, 2020; Gupta and Gentry, 2019; Keane and Neal, 2021). However, these actions also disrupted the supply chains and halted the global economy (Barua, 2020). The extreme scarcity of masks and sterilizers, as well as alarming news reports, contributed to increased anxiety and fear (Cao et al., 2020), resulting in a change in purchasing behavior, to panic buying, as a psychological response (Cao et al., 2020; Ventriglio, Watson and Bhugra, 2020). According to Prentice, Quach, and Thaichon's (2020) research, most of the respondents in five countries (Australia, China, India, Vietnam, and Indonesia) who engaged in panic buying agreed that government intervention was the cause of their behavior. Based on the above concept, four hypotheses are proposed in this study.

**H5:** Government intervention moderates the effect of control on panic buying behavior.

**H6:** Government intervention moderates the effect of social media posts on panic buying behavior.

**H7:** Government intervention moderates the perceived severity's effect on panic buying behavior.

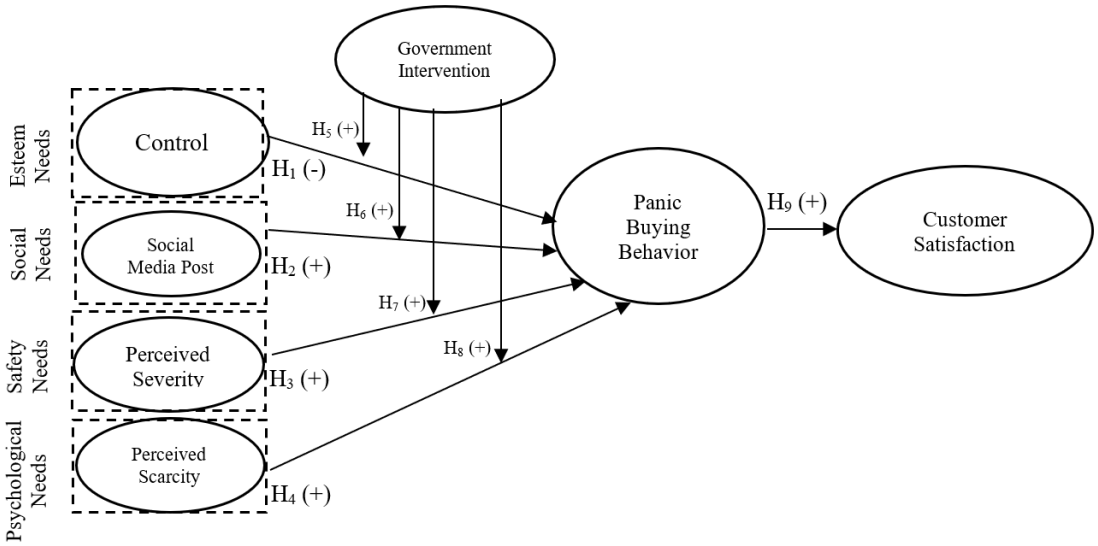
**H8:** Government intervention moderates the perceived scarcity's effect on panic buying behavior.

### *The Effect of Panic Buying Behavior on Customer Satisfaction*

Kotler and Keller (2016) define satisfaction as a person's sentiments of joy or disappointment caused by comparing a product or service's perceived performance (or results) to their expectations. The research results conducted by Ardyan et al. (2021) show that customers' panic buying behavior can affect customer satisfaction. This research shows that when a consumer engages in panic buying behavior and gets what he/she wants, his/her level of satisfaction increases. Ardyan et al. (2021) revealed that people must do various things to fulfill their life and living needs during a crisis, such as a pandemic. If they can perform hoarding behavior, they will be pleased to do it. Along with the items they get, their satisfaction will increase as well. Therefore, the following hypothesis is presented.

**H9:** Panic buying behavior positively affects customer satisfaction.

**Figure 2.** Research Model




*(Source: Maslow, 1943; Yuen et al. 2021; and Ardyan et al. 2021)*

# Method

The study used Maslow's hierarchy of needs theory to examine the consumers' perspective of panic buying behavior. This study used a quantitative approach. According to Neuman (2014), quantitative studies tend to follow the principle of positivism and utilize variables and hypotheses. The emphasis is on proper variable measurement and hypothesis testing. This study used structural equation modeling (SEM) and SmartPLS 3.0. as the analytical tools.

This study used primary data as the type of data. The population in this study were people on the islands of Java and Bali, Indonesia. The analysis unit in this research was at the consumer level. A sample, according to Neuman (2014), is a small group of cases selected by researchers from a large group, and generalized to the population. Non-random sampling was utilized as the sampling approach for this investigation. The data were collected through an online survey using Google Forms. In order to reach a broader range of respondents, the questionnaires were distributed via social media (Instagram, Twitter, and WhatsApp) and the Kudata.id platform. The questionnaires were also in Indonesian, instead of English, to make it easier for the respondents to understand.

This study used the sampling technique known as purposeful sampling. This study used three sample criteria. First, the people living in Java and Bali were at least 18 years old. Second, consumers of grocery and drug stores who went shopping during the period from January to March 2022. Third, users of one, two, or three social media platforms

(Facebook, Instagram, and Twitter). The sample in this study was people who lived in Java and Bali because there was a government regulation in the form of an Instruction from the Minister of Home Affairs (Inmendagri), namely PPKM (Pemberlakuan Pembatasan Kegiatan Masyarakat), so this was relevant and had an influence on panic buying behavior. The sample chosen was social media users (Facebook, Instagram, and Twitter) who were at least 18 years old, because this research examined how social media affected panic buying behavior.

The sample size used in this study followed the minimum adequacy for sample size in partial least squares (PLS) and structural equation modeling (SEM). According to Hair et al. (2014), the minimum size for a sample is at least 10 times more than the total number of question items to be analyzed. This study had 39 questions, so the required sample size was at least 390. Four hundred and sixty questionnaires were distributed from April 14, 2022, to June 7, 2022, but only 456 complied with the research criteria. These 456 questionnaires met the minimum requirements in determining the sample size in the structural equation. After obtaining the data, the researcher conducted a descriptive statistical analysis to observe the overview of the data's distribution from each item of the research data, using SPSS 21 and Microsoft Excel. Furthermore, the researcher also used WarpPLS 7.0 to analyze the outliers and missing values.

### *Measurement*

Each item used in this study was derived from previous studies and measured using a 5-point Likert scale. The Likert scale, according to Sekaran and Bougie (2014), is a scale designed for discovering respondents' attitudes toward a statement. The criteria for each point used were 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. This research addressed seven constructs: control, social media posts, perceived severity, perceived scarcity, government intervention, panic buying behavior, and customer satisfaction.

**Table 1.** Demographic Analysis

| Construct | ID | Measurement Items | Source |
|---|---|---|---|
| **Gender** | CON1 | I feel that I cannot control what is happening | Kemp, Kennett-Hensel and Williams (2014) |
| | CON2 | I feel like the situation is out of my control | |
| | CON3 | I feel like that is all I can do | |
| | CON4 | I am nervous and confused. | |
| **Social Media Posts** | MED1 | Social media create and influence the phenomena of panic buying behavior | Arafat et al. (2021) |
| | MED2 | Anxieties about social media drive panic buying behavior | |
| | MED3 | Spreading fear on social media of not having a product encourages panic buying behavior | |
| | MED4 | I panic when seeing photos and videos of empty shelves of necessities on social media | |
| | MED5 | Feelings of uncertainty during the COVID-19 pandemic have affected my buying habits | |
| **Perceived Severity** | SEV1 | If I get COVID-19, it will threaten my career | Huang et al. (2016) |
| | SEV2 | If I get COVID-19, it will affect my relationship with my family and friends | |
| | SEV3 | If I get COVID-19, the security of my finances will be affected | |
| | SEV4 | It will change my whole life if I get COVID-19 | |

| Construct | ID | Measurement Items | Source |
|---|---|---|---|
| **Perceived Scarcity** | CAR1 | The product that I desire will be scarce during the COVID-19 pandemic | Byun and Sternquist (2008) |
| | CAR2 | The accessibility of brands for a product will be difficult during COVID-19 | |
| | CAR3 | Product size will be minimal during COVID-19 | |
| | CAR4 | Product type will be minimal during COVID-19 | |
| **Government Intervention** | GOV1 | With the aim of increasing public awareness and suggesting protective measures against COVID-19, the government uses banners | Duan et al. (2020) |
| | GOV2 | With the aim of increasing public awareness and suggesting protective measurement against COVID-19, the government uses television broadcasts | |
| | GOV3 | With the aim of increasing public awareness and suggesting protective measures against COVID-19, the government uses brochures | |
| | GOV4 | With the aim of increasing public awareness and suggesting protective measures against COVID-19, the government uses text messages | |
| | GOV5 | The government organizes health personnel for the precaution and control of COVID-19 | |
| | GOV6 | The government organizes community workers to take precautions against and control COVID-19 | |

| | | | |
|---|---|---|---|
| | GOV7 | The government organizes social organizations to take precautions against and control COVID-19 | |
| | GOV8 | The government organizes volunteers to take precautions against and control COVID-19 | |
| | GOV9 | The government organizes property owners to take precautions against and control COVID-19 | |
| | GOV10 | The government organizes scholars and professional experts to take precautions against and control COVID-19 | |
| | GOV11 | The government has appointed a hospital to receive and treat COVID-19 patients | |
| | GOV12 | The government has designated a hospital for medical observation of patients with suspected COVID-19 | |
| | GOV13 | The government has provided psychological services for psychological counseling | |
| **Panic Buying Behavior** | PAN1 | The feeling of fear encourages me to purchase things excessively and stock up at home | Lins and Aquino (2020) |
| | PAN2 | Scared of not acquiring the product I need drives me to purchase more goods | |
| | PAN3 | I panicked when I thought that essential products might be out of stock; therefore, I chose to purchase them in massive numbers | |
| | PAN4 | The feeling of fear drove me to buy more than usual | |
| | PAN5 | Panic drove me to purchase more stuff than usual | |

| | | | |
|---|---|---|---|
| | PAN6 | Feelings of uncertainty drive panic buying | |
| **Customer Satisfaction** | CUS1 | Overall, I am satisfied that I made a purchase during the COVID-19 pandemic | Ardyan et al. (2021) |
| | CUS2 | The performance of the product I purchased met my expectations | |
| | CUS3 | The performance of the product I purchased exceeded my ideal expectations | |

# Results

## *Validity and Reliability Test*

This study used two validity tests, namely the validity test of the convergent variable and the validity test of the discriminant variable. Table 2 presents the findings of the convergent validity test, while Table 4 displays the results of the discriminant validity test. Hair et al. (2018) state that the factor loading and AVE value reflect the results of the construct's validity testing. The accepted AVE value is ≥0.5, and the accepted factor loading value is ≥0.708.

Based on the convergent validity test results, Table 2 shows that several measurement items have a factor loading value of less than 0.70, namely items SM4, GI1, GI2, GI3, GI4, and GI13, with factor loading values of 0.659, 0.574, 0.678, 0.363, 0.518, and 0.357. However, in social studies, factor loading values between 0.40 and 0.70 are scaled using the combined reliability results or the average variance extracted (AVE) if they exceed the recommended thresholds. The result can still be considered for removal (Hair et al., 2014). Therefore, only IP3 and IP13 statement items were removed from the measurement, to see the average variance extracted (AVE) results. The findings in Table 3 present the extracted mean-variance test. After removing IP3 and IP13 from the measurement, Table 3 shows that the AVE results fulfilled the minimum criteria, which was higher than 0.5.

**Table 2.** Convergent Validity

| Construct | Item | Convergent Validity | |
|---|---|---|---|
| | | **AVE** | **Factor Loading** |
| **Control** | CONI | 0.631 | 0.809 |
| | CON2 | | 0.826 |
| | CON3 | | 0.803 |
| | CON4 | | 0.737 |
| **Social Media Posts** | MED1 | 0.550 | 0.787 |
| | MED2 | | 0.725 |
| | MED3 | | 0.722 |
| | MED4 | | 0.659 |
| | MED5 | | 0.805 |
| **Perceived Severity** | SEV1 | 0.651 | 0.824 |
| | SEV2 | | 0.784 |
| | SEV3 | | 0.793 |
| | SEV4 | | 0.825 |
| **Perceived Scarcity** | CAR1 | 0.774 | 0.865 |
| | CAR2 | | 0.897 |
| | CAR3 | | 0.863 |
| | CAR4 | | 0.893 |
| **Government Intervention** | GI1 | 0.442 | 0.574 |
| | GI2 | | 0.678 |
| | GI3 | | 0.363 |
| | GI4 | | 0.518 |
| | GI5 | | 0.783 |
| | GI6 | | 0.810 |
| | GI7 | | 0.796 |
| | GI8 | | 0.799 |
| | GI9 | | 0.716 |
| | GI0 | | 0.716 |
| | GI11 | | 0.671 |
| | GI12 | | 0.669 |
| | GI3 | | 0.363 |
| **Panic Buying Behavior** | PAN1 | 0.798 | 0.878 |
| | PAN2 | | 0.902 |
| | PAN3 | | 0.905 |
| | PAN4 | | 0.809 |
| | PAN5 | | 0.826 |
| | PAN6 | | 0.803 |

| | | | |
|---|---|---|---|
| **Customer Satisfaction** | CUS1 | 0.634 | 0.836 |
| | CUS2 | | 0.687 |
| | CUS3 | | 0.927 |

**Table 3.** Extracted Average Variable (AVE)

| Construct | AVE |
|---|---|
| **Control** | 0.631 |
| **Social Media Posts** | 0.550 |
| **Perceived Severity** | 0.651 |
| **Perceived Scarcity** | 0.774 |
| **Government Intervention** | 0.501 |
| **Panic Buying Behavior** | 0.798 |
| **Customer Satisfaction** | 0.634 |

The next validity test was the discriminant validity test using the Fornell-Lacker criteria. The square root of AVE for each construct was higher than the highest correlation with the other constructs. Table 5 reveals that AVE's square root for each construct was higher than the highest correlation of the different constructs, thus fulfilling the Fornell-Lacker criteria.

**Table 4.** Discriminant Validity

| | GOV | CUS | CON | PAN | SEV | CAR | MED |
|---|---|---|---|---|---|---|---|
| GOV | **0.209** | | | | | | |
| CUS | 0.341 | **0.796** | | | | | |
| CON | 0.065 | 0.092 | **0.794** | | | | |
| PAN | 0.164 | 0.104 | 0.507 | **0.893** | | | |
| SEV | 0.321 | 0.052 | 0.381 | 0.427 | **0.807** | | |
| CAR | 0.193 | 0.125 | 0.277 | 0.463 | 0.301 | **0.880** | |
| MED | 0.708 | 0.068 | 0.527 | 0.639 | 0.328 | 0.338 | **0.741** |

The next test was the construct's reliability test. Cooper and Schindler (2014) mention that the reliability test determines the consistency of the measuring instruments applied in a study. Reliability testing in this study used the rule of thumb from Hair et al. (2014), by analyzing composite reliability values of greater than 0.7. Composite reliability can be considered reliable when a structural equation model represents a measure of reliability in a study.

**Table 5.** Composite Reliability

| Construct | Reliability | Conclusion |
|---|---|---|
| Control | 0.872 | Reliable |
| Social Media Posts | 0.859 | Reliable |
| Perceived Severity | 0.882 | Reliable |
| Perceived Scarcity | 0.932 | Reliable |
| Government Intervention | 0.916 | Reliable |
| Panic Buying Behavior | 0.959 | Reliable |
| Customer Satisfaction | 0.837 | Reliable |

## *Characteristics of Respondents*

The respondents in this study were 456 people obtained from online surveys via Google Forms. Of the 456 respondents, 73.9% were male and 26.1% female. By age, 25.4% were under 20 years old, 53.9% were 20 to 25 years old, 13.6% were over 25 to 30 years old, 4.2% were over 30 to 35 years old, 1.8% were around 35 to 40 years old, and 1.1% were over 40 years old. Based on domicile, 35.7% lived in East Java, 12.7% lived in Central Java, 17.3% lived in DI Yogyakarta, 21.5% lived in West Java, 17.3% lived in DKI Jakarta, and 3.3% lived in Bali. Regarding their education, 0.2% were junior high school graduates, 54.6% were high school graduates, 8.1% were diploma graduates, 34.4% were undergraduate graduates, and 12% were postgraduate graduates. Regarding their monthly income, 40.8% had no income, 16.2% earned < IDR 1,000,000, 18.6% earned between IDR 1,000,0000 to IDR 2,500,000, 16% earned between > IDR 2,500,000 to IDR 5,000,000, 4.2% earned between > IDR 5,000,000 to IDR 7,500,000, and 4.2% earned > IDR 7,500,000.

## *Structural Model Testing*

Hair et al. (2014) state that there is no goodness of fit criterion in evaluating the overall model using PLS-SEM, so research hypothesis testing using the PLS-SEM method must first be tested for the model's fit (model fit). The model indicator can be fit if the standardized root mean square residual (SRMR) has a p-value below 0.1 or 0.08 (Hu and Bentler, 1998). According to the test's finding, Table 6 displays that the value of SRMR was 0.068, so it was declared appropriate because it met the standardized root mean indicator criteria.

**Table 6.** Model Fit

| | *Saturated Model* | *p-value* |
|---|---|---|
| **SRMR** | 0.058 | 0.068 |
| **d_ULS** | 2.581 | 3.580 |
| **d_G** | 1.085 | 1.107 |
| **Chi_Square** | 2,774.015 | 2,843.022 |
| **NFI** | 0.785 | 0.780 |

The study uses path coefficient analysis for testing the hypotheses. The value of the path coefficient defines the significance level in hypothesis testing. Cooper and Schindler (2014) say that the proposed hypothesis is accepted if the significance level has a p-value of ≤ 0.05. Based on these criteria, a hypothesis is supported if a construct's effect on another construct has a critical ratio (CR) value ≥ 1.96 at a significance level of 0.05. **Table 7** presents the results of the hypotheses testing.

**Table 7.** Hypothesis Testing Through Path Coefficient

| Construct | Standardized Regression Weight (β ) | Standard Deviation (STDEV) | T-Statistics (O-STDEV) | p-values |
|---|---|---|---|---|
| **CON→PAN** | -0.099 | 0.047 | 2.215** | 0.027 |
| **MED→PAN** | 0.438 | 0.045 | 9.609** | 0.000 |
| **SEV→PAN** | 0.125 | 0.042 | 2.918** | 0.004 |
| **CAR →PAN** | 0.164 | 0.043 | 3.819** | 0.000 |
| **CON→GOV →PAN** | -0.040 | 0.049 | 0.828 | 0.408 |
| **MED→GOV →PAN** | 0.083 | 0.041 | 2.136** | 0.033 |
| **SEV→GOV→PAN** | -0.032 | 0.055 | 0.594 | 0.553 |
| **CAR→GOV- →PAN** | -0.044 | 0.043 | 1.047 | 0.295 |
| **PAN→CUS** | 0.258 | 0.054 | 4.796** | 0.000 |

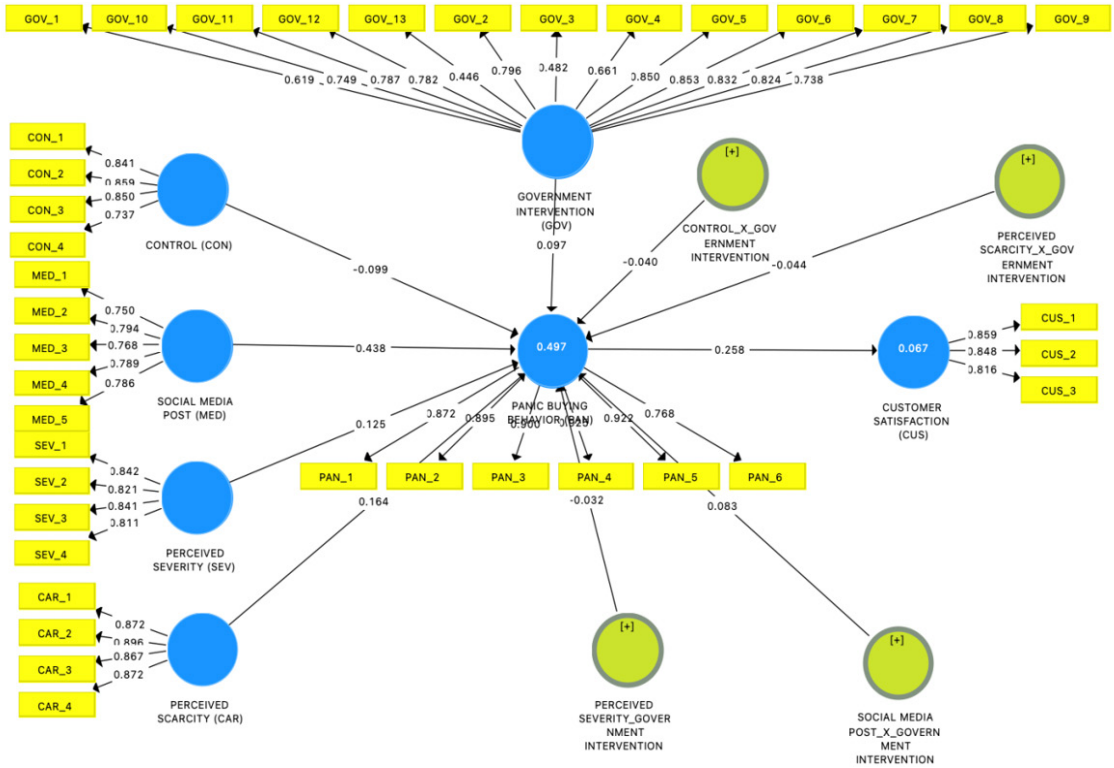
***Notes:*** **Significant at 0.05 (2-tailed).
CON = Control; MED = Social Media Posts; SEV = Perceived Severity; CAR = Perceived Scarcity; PAN = Panic Buying Behavior; GOV = Government Intervention; CUS = Customer Satisfaction.

**Table 7** shows that β = -0.099; p-value <0.05; CR ≥ 1.96, which meant that the control negatively and significantly affected panic buying behavior. As such, **H1 is supported**. In line with H1, social media posts positively and significantly affected panic buying behavior with β= 0.438; p-value <0.05; CR ≥ 1.96. Therefore, **H2 is supported**. In addition, the perceived severity also positively and significantly affected panic buying behavior statistically. So, **H3 is also supported**. Furthermore, perceived scarcity positively and significantly affected panic buying behavior. This result indicates that **H4 is supported**.

As for the moderating variable of government intervention, it appeared as a significant factor that strengthened the influence of social media postings on panic-buying behavior (β=0.083; p-value <0.05; CR≥ 1.96). This means **H6 is supported.** However, the other moderating effects of government intervention, which are **H5, H7, and H8, are not supported** with β=-0.040; p-value> 0.05; CR ≤ 1.96 for H5, β=0.032; p-value > 0.05; CR= ≤ 1.96 for H7, and β=-0.044; p-value> 0.05; CR ≤ 1.96 for H8. Lastly, panic buying behavior positively and significantly affected customer satisfaction, with β=0.258; p-value <0.05; CR ≥1.96. As a result, it showed that **H9 is also supported**.

Based on the estimation results of the structural equation model using the maximum likelihood method, six of the hypotheses proposed in this study, namely H1, H2, H3, H4, H6, and H9, are empirically supported. Meanwhile, the hypothesis testing results showed that the other three hypotheses, H5, H7, and H8, are not supported. Figure 3 below displays the estimation results of the structural equation model.

**Figure 3.** Structural Equation Model (bootstrapping)



# Discussion of Results

**Table 8.** Summary of Hypothesis Testing Results

| Constructs | Hypothesis Testing Results |
|---|---|
| H1 (Control negatively affects panic buying behavior) | Supported |
| H2 (Social media posts positively affect panic buying behavior) | Supported |
| H3 (Perceived severity positively affects panic buying behavior) | Supported |
| H4 (Perceived scarcity positively affects panic buying behavior) | Supported |
| H5 (Government intervention moderates the effect of control on panic buying behavior) | Not Supported |
| H6 (Government intervention moderates the effect of social media posts on panic buying behavior) | Supported |
| H7 (Government intervention moderates the perceived severity effect on panic buying behavior) | Not Supported |
| H8 (Government intervention moderates the perceived scarcity effect on panic buying behavior) | Not Supported |
| H9 (Panic buying behavior positively affects customer satisfaction) | Supported |

### *Hypothesis 1: Control negatively affects the phenomenon of panic buying behavior.*

Hypothesis 1 is supported. The results of this research are related to the theory of compensatory control, which argues that people bought hastily during the COVID-19 pandemic, to retrieve control of their situation. Problem-solving is one of the best ways to take control or reclaim it again for their position. Yuen et al. (2021) show that problem-solving strengthens a person's belief in retrieving control of his or her life. Panic buying behavior can be considered to be problem-solving, because individuals can do it. In summary, panic buying is also part of compensatory consumption behavior, in which individuals turn to purchasing products to compensate for deficits caused by their perceived needs and desires that are only indirectly being met (Yuen et al., 2020). As for this case, a deficit means losing control over control and, thus, can only be retrieved through panic buying as a problem-solving solution.

### *Hypothesis 2: Posts on social media positively affect panic buying behavior.*

Hypothesis 2 is supported. This is because this research was conducted during January to March 2022, when there was an increase in cases of the Omicron variant of COVID-19, so the Enforcement of Community Activity Restrictions (PPKM) policy was applied on the islands of Java and Bali. The PPKM policy enhances the role of social media, to increase interaction and the exchange of information among individuals. Roy Nicholas Mandey, chairman of the Indonesian Retailers Association (Aprindo), stated on Kompas.com that panic purchasing occurred in at least several locations, including Jakarta, Depok, Tan-

gerang, Bekasi, Bogor, Surabaya, and Semarang. Consequently, there was an average significant increase in purchases, particularly of masks and hand sanitizers. According to Roy, panic purchasing occurs when apprehensive individuals fall victim to social media hoaxes. Society devolves into irrational paranoia, irrational dread, and irrational hasty decision-making. Cogley (2020) and Mao (2020), in Naeem, 2021, explain that social media allow various features for people to communicate with each other, such as images, audio, videos, chats, tweets/retweets, tags, sharing, and likes. The platforms also provide people from many professions, politicians, celebrities, government officials, the media, and others, with ways to share information and interests. Concerning that, many people share their experiences or activities on social media, which leads to panic buying behavior. Barr (2020), in Naeem (2021), reports that many American users on Twitter shared images of empty shelves at Costco supermarkets during the COVID-19 pandemic. Consequently, many people started to buy products on a large scale, putting pressure on suppliers and supermarkets worldwide.

### *Hypothesis 3: Perceived severity positively affects panic buying behavior.*

Hypothesis 3 is supported. Chua et al. (2021) mention the perceived severity of the loss level due to infection with COVID-19. It measures consumers' conceptions of the impact of COVID-19 infection on one's job, finances, relationship with families and friends, and the upcoming events in one's life. This also affects the anxiety a person feels when faced with the possibility of getting infected by COVID-19. The condition indicates that the pandemic created psychological issues, including anxiety, depression, fear, and stress about being infected with COVID-19. The common implicit psychiatric problems of contracting COVID-19 come from unemployment, educational stress, poverty, and relationship problems. (Chua et al., 2021). Dsouza et al. (2020) highlight that those fears about getting infected by COVID-19 provide a crucial reason for suicide, rather than financial problems. Other essential risk considerations also come from family disputes, social rejection, and fear of being unable to go home. In addition, consumers might also experience pessimism for the future, due to the discouraging social environment and negative psychological, economic, and emotional states. That will lead to thinking about the worst scenarios. Following that issue, people will think there will be an inaccessible supply chain, and recognize the socially undesirable increase in behavior in other people, such as hoarding and panic buying. So it can be concluded that the perceived severity of consumers can cause panic buying behavior, to protect themselves rather than paying attention to the interests of others. The results of this research correspond with prior studies investigating the psychological factors influencing panic buying. Nguyen et al. (2022) found that there is a positive correlation between perceived severity and panic buying. This study has, once

again, consolidated the positive relationship between perceived severity and panic buying.

### *Hypothesis 4: Perceived scarcity positively affects panic buying behavior.*

Hypothesis 4 is also supported. The results of this study confirm Brehm's (1966) reactance theory, which suggests that when people are aware of the available resources, they have more freedom and choice to look among the available products. They will also be less motivated to panic buy. Sufficient supply to meet demand shows the low probability of an increased price due to the surplus supply. During the COVID-19 pandemic, goods became scarce and difficult to access for some time, so the perceived scarcity by consumers drove the panic buying behavior. This finding also aligns with the interview conducted by Patiro et al. (2022). During the first observation period, from April 2020 to May 2020, 30 respondents from Jakarta, Tangerang, and Banten were interviewed online. In three separate sessions, these interviews were conducted with the Zoom meeting application. There were 10 participants in each session. The interviews revealed that most individuals who exhibited panic-buying behavior were affected by a transient emotional episode, caused by the perceived scarcity of essential products, the influence of others, specific information, and their knowledge of the subject at hand.

### *Hypothesis 5: Government intervention moderates the effect of controls on panic buying behavior.*

The results of the path coefficient analysis indicate that there is no support for Hypothesis 5. The control variable is the individual's ability to insert dominance over one's negative emotions and intrusive thoughts, as well as the ability to cope with traumatic situations (Gabrys et al., 2018). The process of self-control refers to a managed reflective system. Self-control allows a person to evaluate whether he/she is in control of the current situation, prevent impulsive reactions (e.g., panic buying), and conform to the first norm (Soror et al., 2015). The existing literature suggests that consumers with low levels of self-control are more susceptible and persuasive to external factors than consumers with high levels of self-control. (Li et al., 2021). The reason lies in the vision for long-term goals, as possessed by consumers with high levels of self-control. They tend to make rational decisions and avoid external influences, or changes, for one example.

In contrast, consumers will try to retrieve control of the current situation if they lose their self-control. Based on the reasons above, it can be concluded that the presence, or absence, of government intervention will not change the effect of control on panic buying behavior. Consumers will create rational decisions and avoid external influences, or changes by government intervention.

### *Hypothesis 6: Government intervention moderates the effect of social media posting on panic buying behavior.*

Hypothesis 6 is supported. These results explain that government intervention will strengthen the influence between social media postings and panic buying behavior. This study's results align with research conducted by Prentice et al. (2021) in four countries, namely Indonesia, China, Australia, and India, to examine the role and government support for panic buying behavior. The research results show that since the first two COVID-19 cases in Indonesia, in March 2020, there was a wave of panic shopping in supermarkets and drug stores. People in Jakarta shared their experience, where people excessively shopped for many goods and supplies to stockpile, amid fears of a possible COVID-19 virus outbreak. Their panic buying is associated with their observation of other people making panic purchases in supermarkets, and sending news or pictures of panic buying situations in supermarkets or drug stores (The Jakarta Post, 2020), thus reinforcing them to make panic purchases.

### *Hypothesis 7: Government intervention moderates the effect of perceived severity on panic buying behavior.*

The results of the path coefficient analysis indicate that there is no support for Hypothesis 7. So, the presence or absence of the government's role did not change the effect of the perceived severity on panic buying behavior. Several reasons could cause this. First, the perceived severity is linked to how severe the consequences are that accompany an individual during a health crisis. As in the COVID-19 pandemic, there is an increased risk perception. That said, the brain will identify a threatening condition in the cognitive process, leading to decreased control over cognitive function and performance (Yuen et al., 2021). Second, Dsouza et al. (2020) highlight that the fear of getting infected by COVID-19 has several risks, such as family disputes, social rejection, the burden of being unable to go home, and even suicide. Individual perceptions of this cause consumers to feel pessimistic about future events, causing them to imagine worst-case scenarios. For the above two reasons, it can be concluded that the presence or absence of intervention by the government will not change the perceived severity's effect on the phenomenon of panic buying.

### *Hypothesis 8: Government intervention moderates the effect of perceived scarcity on the phenomenon of panic buying behavior.*

Hypothesis 8 is also not supported. Therefore, the presence or absence of the government's role did not change the effect of scarcity perceptions on panic buying behavior. The perceived scarcity is closely related to Brehm's (1966) reactance theory, which states that an individual experiences a reactance of psychology that refers to a motivational state to

secure behavioral freedom when threatened or prohibited. As for this case, products were predicted to be unavailable within a short period of time due to the health crisis. That condition would create a threat to an individual's freedom. (i.e., prevent or reduce access to the product). As a result, the condition will signal the psychological reactance to be more attracted and interested in the product. It triggers a feeling of urgency to stockpile, similar to panic buying (Pan et al., 2020).

Moreover, another theory linking perceived scarcity to panic buying is regret anticipation (Yuen et al., 2020). According to Wang et al. (2019), emotional consequences are valued when deciding something in unsettled conditions. Consistent with the prospect theory, people will more likely experience regret than joy at not making a panic purchase because of perceived scarcity during the outbreak of a disease. Therefore, the above two reasons, namely psychological reactions, and anticipated regret, can be why the presence or absence of government intervention will motivate individuals to panic buy.

***Hypothesis 9: Panic buying behavior positively affects customer satisfaction.*** Hypothesis 9 is supported. According to the study's findings, when a consumer engages in panic buying behavior and gets what he/she wants, his/her level of satisfaction increases. This satisfaction arises because, during a crisis such as the COVID-19 pandemic, people do different things to fulfill their basic needs (Ardyan et al., 2021). Times of crisis are when they have less control over their purchases. Losing control will create negative feelings and anxieties (Darrat, Darrat, and Amyx, 2016). Consumers will pay less attention to brands, as they panic about losing their basic needs. When they manage to buy the products, a sense of accomplishment will also increase their satisfaction.

# Conclusion

The current research aims to identify the factors influencing consumers' panic buying behavior during the COVID-19 pandemic, and examine their interrelationships. By applying Maslow's hierarchy of needs theory, this study proposes the factors that explain consumers' panic purchasing behavior. Basically, this study aims to examine the effect of control, social media posts, perceived severity, and perceived scarcity on panic buying behavior, the impact of panic buying behavior on customer satisfaction, and the moderating effect of government intervention.

The unit of analysis used in this study is at the individual level. An online survey was conducted in Indonesia using Google Forms. The questionnaires were distributed from April 14, 2022, to June 7, 2022, and received 456 valid data points. The outcome indicates that control negatively affects panic buying behavior. Furthermore, social media,

perceived severity, and perceived scarcity positively affect panic buying behavior. The government intervention variable only moderated the effect of social media on panic buying. Finally, the phenomenon of panic buying significantly affects customer satisfaction.

## Theoretical Implication

The study makes a significant contribution to academic research. First, it bridges a critical gap in the literature on consumer panic buying behavior by introducing Maslow's hierarchy of needs theory to understand the factors influencing it. There are only a few studies on consumer buying behavior. From a limited number of theoretical studies, most research has focused primarily on the psychological and social causes of panic buying behavior, rather than the motivational needs of individuals in the face of threats. This study provides an alternative perspective by introducing Maslow's hierarchy of needs theory to consumer panic buying behavior.

Furthermore, the theory provides an in-depth evaluation of the components influencing consumers' panic buying behavior: control, social media postings, perceived severity, and perceived scarcity. Theoretically, the findings examine the moderating effect of government intervention on control, social media postings, perceived harm, and the perceived scarcity on panic buying behavior. In this case, government intervention only strengthens the effect of social media posts on panic buying behavior. This result means that the more intervention the government makes regarding policies to prevent the expansion of the COVID-19 pandemic, the stronger the impact is on social media posts and panic buying behavior. Finally, this study provides the measurement and operationalization of the measurement items developed through synthesizing the panic buying behavior literature.

## Practical Implication

From a policy point of view, this research can provide some suggestions for policymakers, the retail industry, marketers, and individuals about efficiently allocating scarce resources to manage disruptions to strategic and critical goods, while ensuring safe consumer distancing. Policymakers and the retail sector must replenish store shelves to ensure consumers can access essential items. From a media perspective, policymakers must prevent the media from displaying a visual image of out-of-stock situations and spreading fake news that can cause panic among consumers. Thus, this strategy helps limit consumers' perceived severity and scarcity, reducing their panic buying behavior. In addition to the steps above, the government can partner with other institutions to initiate activities to help people maintain positive mental health.

## Limitations and Suggestions for Further Research

The data in this study is cross-sectional, using specific criteria in the context of a pandemic. The survey in this research was conducted at the peak of the COVID-19 pandemic, especially the Omicron variant, during the period from January to March 2022, when the panic buying phenomenon was at its peak. Future research may conduct studies over more extended periods, to examine the sustainability of the impact of the crisis, to better understand the motivations behind consumer panic buying behavior. In addition, the subsequent studies can be carried out in contexts other than the COVID-19 pandemic, for example, in other crises and natural disasters. This study uses Maslow's hierarchy of needs theory (1943) approach, to examine the factors influencing panic buying behavior. These factors are only based on individual motivational needs, so further research still has a lot of room to examine other factors regarding the antecedents and consequences of panic buying behavior, using different perspectives and theories. Finally, this study only uses the moderating variable of government intervention to determine the strength of the factors causing panic buying behavior. Therefore, further research can include other moderating variables, such as interventions by retailers and businesses, to see the solid or weak effect of other constructs on panic buying behavior.

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