

How Does Mindfulness Alleviate Panic Buying: The Mediating Role of Social Alienation and Death Anxiety

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Purpose: Health crises and disease outbreaks can trigger public fear, leading to behaviors such as panic buying. It's crucial to learn from past outbreaks and identify factors that can curb panic buying, enabling more effective management of this phenomenon. Although mindfulness has been shown to influence individual consumption behavior, no research to date has explored its association with panic buying. This research utilizes terror management theory to investigate the influence of mindfulness, as a personality trait, on panic buying during a health crisis, and to explore the sequential mediating roles of social alienation and death anxiety.

Methods: A two-wave survey was administered to 342 Chinese college students during the COVID-19 outbreak. Initially, students provided their mindfulness levels and demographic information. A week later, participants who had completed the first wave reported their panic buying intentions, social alienation, and death anxiety.

Results: Structural Equation Modeling analysis revealed a negative relationship between mindfulness and panic buying, with social alienation and death anxiety acting as both parallel and serial mediators in this relationship.

Conclusion: Our research deepens the understanding of mindfulness from a consumer behavior perspective, fills a gap in the study of mindfulness and panic buying, and uncovers the "black box" of this relationship. The findings highlight the potential of mindfulness in mitigating panic buying during crises, offering practical implications for managing pandemic-related challenges and providing valuable insights for future research on mindful consumption.

Keywords: mindfulness, panic buying, social alienation, death anxiety

Introduction

Health crises and disease outbreaks can significantly impact economic and social development, as well as individuals' daily lives.^{1,2} The COVID-19 pandemic has exacerbated numerous negative mental health outcomes.^{3,4} Studies conducted during this period revealed that approximately one-third of consumers experienced a compulsion to stockpile essential items.⁵ The unsettling circumstances can incite widespread panic, leading to irrational behaviors such as panic buying.^{6,7} Panic buying is characterized by individuals losing control and purchasing large quantities of specific products or goods, driven by an environment of fear.⁸ Prior studies suggest that panic buying serves as a coping mechanism in reaction to perceived threats and negative experiences during health crises.^{9–11}

It is well-documented that numerous anomalous panic buying behaviors have also manifested globally during the pandemic, including the bulk purchasing of toilet paper, masks, epidemic prevention medicines, hand sanitizers, and food items since the onset of COVID-19.^{6,11,12} Such panic buying incidents can lead to adverse consequences, including waste of resources due to uninformed purchases, price volatility induced by frenzied buying, and unequal distribution of epidemic prevention materials, ultimately exerting negative impacts on social stability and economic development.^{6,13}

Given the numerous adverse outcomes of panic buying, we need to learn from past outbreaks, understand the motivations, and come up with effective ways to restrain and lessen it.

Mindfulness is characterized as the state of directing one's attention and cultivating an acute awareness of present-moment experiences.^{14,15} It's believed that mindfulness can be enhanced through various training methods.¹⁶ As an inherent personality trait, varying levels of mindfulness in individuals can lead to different psychological and behavioral outcomes.^{17,18} During health crises, mindfulness may serve as an effective strategy for emotional calming and behavior regulation.¹⁹ The link between trait mindfulness and panic buying, along with the mechanisms underlying this connection, has yet to be explored.

Social alienation and death anxiety provide valuable perspectives to examine the association between mindfulness and panic buying especially in the COVID-19 pandemic context. The unprecedented conditions of the COVID-19 pandemic intensified feelings of social alienation and death anxiety. Government-mandated measures, such as social isolation and restricted mobility, disrupted normal social interactions and increased feelings of disconnection from others.²⁰ These conditions align with the concept of social alienation, which refers to feelings of powerlessness, confusion about social norms, and a sense of being distanced from others.²¹ Similarly, the pandemic brought the reality of mortality to the forefront of public consciousness. The constant media coverage of rising death tolls, the threat of infection, and the uncertainty surrounding the virus significantly heightened death anxiety—a psychological response to the awareness of one's mortality.²² Empirical studies have indicated that death anxiety associated with the COVID-19 pandemic is a leading psychological cause of panic buying.²³ In the current study, we highlighted social alienation and death anxiety as mediators of the associations between mindfulness and panic buying.

Mindfulness can strengthen the connection between the inner self and the outer world,¹⁵ potentially leading to increased social contact and reduced social alienation for those with higher mindfulness levels. Additionally, mindfulness offers a pathway for individuals to relinquish their fears concerning the future, thereby alleviating some of the detrimental psychological consequences that arise during such crises.²³ Terror management theory²⁴ suggests that maintaining ties to social structures and activating cultural beliefs can alleviate death anxiety and its effects on subsequent attitudes and behavior. Therefore, mindfulness is likely associated with reduced panic buying through decreased social alienation, reduced death anxiety, and the sequential pathway in which social alienation further reduces death anxiety, ultimately leading to lower panic buying.

This research aimed to concentrate on the demographic of Chinese college students, recognizing that health crises and disease outbreaks can pose substantial risks to the mental well-being of university students.²⁵ This heightened risk was attributed to the gradual increase in interpersonal distance, which led to feelings of alienation.²⁶ College students may be uniquely motivated to engage in panic buying, making it crucial to understand the psychological factors underlying such irrational behavior during health crises.

Moreover, in accordance with policies issued by the Chinese government during the COVID-19 pandemic, residents were mandated to undergo compulsory home quarantine or restrict their outings to essential activities only. Physical distancing during public health crises is not a new phenomenon, and its psychological and behavioral impacts have been well-documented.^{20,27} Previous research has shown that emotional health outcomes associated with physical distancing include heightened fear and anxiety,²⁸ loss of daily structure,²⁹ and significant disruptions in people's typical social lives.³⁰ These factors, combined with China's unique socioeconomic and cultural context, likely fueled panic buying during the pandemic.

In developing nations, consumers often compete for limited resources, adapting to conditions of scarcity.³¹ The prolonged period of strict quarantine in China, coupled with the cultural emphasis on preparedness and a tradition of hoarding,⁹ may have further exacerbated the tendency toward panic buying. For instance, previous research has found that hoarding symptoms were significantly more pronounced among Chinese students compared to their counterparts in other countries.³² This cultural predisposition, combined with the unprecedented challenges posed by the pandemic, provides a unique context for understanding panic buying behavior. Therefore, this study aims to explore the influence of mindfulness on panic buying among college students in the Chinese context.

Our research endeavor sought to address the research gap by exploring the association between mindfulness and panic buying among college students in China. We used a two-wave design and tested a multi-mediation model among Chinese

college students during the COVID-19 pandemic. We also examined the psychological mechanisms of this relationship, focusing on social alienation and death anxiety. As the first study to connect mindfulness to panic buying, this research expands our understanding of the benefits of mindfulness in consumption contexts.

Beyond its theoretical contributions, this study holds significant practical relevance for managing consumer behavior during crises such as the COVID-19 pandemic. The findings highlight the critical roles of mindfulness in inhibiting panic buying, offering actionable insights for educational organizations, corporations, and policymakers. For educational organizations, the findings highlight the potential of mindfulness to foster emotional resilience and rational decision-making among students. This can help mitigate impulsive behaviors, such as panic buying, during times of uncertainty. For corporations, understanding the role of mindfulness in reducing panic buying can inform strategies to promote more mindful and sustainable consumption patterns, ultimately enhancing consumer trust and brand loyalty. For policymakers, the study underscores the importance of incorporating mindfulness-based approaches into public health and crisis management strategies to address the psychological factors that drive irrational consumer behavior. By demonstrating the link between mindfulness and reduced panic buying, this study provides a foundation for developing practical strategies to manage consumer behavior and promote public well-being during times of crisis.

Theoretical Background and Hypotheses

Mindfulness and Panic Buying

Panic buying is a socially undesirable and irrational response to external threats.²³ Mindfulness, which involves a clear understanding of one's inner and outer world, promotes rational thinking by making positive distinctions and choices about differences, disagreements, and discrepancies between observed objects, people, and events.¹⁵ An fMRI study found that mindfulness can lead to more rational decisions due to increased activity in the posterior superior temporal cortex of the brain.³³ Empirical evidence also showed that individuals with higher trait mindfulness exhibit more rational thinking,³⁴ which may be inversely related to panic buying during a crisis.

Mindfulness can help to improve self-regulation in the face of stressful or threatening experiences.³⁵ A study during COVID-19 found that mindfulness enables individuals to cope with the demands of stressful events and maintain a strong sense of coherence during crises.³⁶ Mindfulness has been shown to reduce stress-related behaviors such as alcohol-seeking,³⁷ binge eating,³⁸ and risk-taking behavior.³⁹

From the standpoint of stress and coping, panic buying can be regarded as a stress-response behavior.⁴⁰ Mindfulness can enhance self-regulation by helping individuals remain accepting and non-judgmental in the face of stressors, thereby avoiding repeated negative interpretations of stressful events.⁴¹ For example, a research found that mindfulness enables individuals to cope with the demands of stressful events and maintain a strong sense of coherence during COVID-19 pandemic.³⁶ This suggests that mindfulness may mitigate panic buying by reducing the emotional and cognitive burden of stress, allowing individuals to respond more rationally to crises.

Moreover, the onset of health crises and disease outbreaks can trigger an inner sense of panic, a leading cause of panic buying.⁵ Research has shown that mindfulness can help alleviate panic,⁴² suggesting that it might also help reduce panic buying. Panic buying, an irrational behavior driven by uncertainty about policies or situations,²³ could potentially be mitigated by mindfulness, which has been identified as a coping strategy for uncertainty in previous research.⁴³ These studies collectively suggest that mindfulness might negatively influence panic buying.

The Mediating Role of Social Alienation

Mindfulness, characterized by flexibility and non-judgmental awareness, may play a key role in mitigating social alienation. Social alienation typically refers to feelings of powerlessness, confusion about social norms, and a sense of being distanced from others.²¹ It arises from unmet social and safety needs and can lead to various forms of urban unrest. By fostering a clear and accepting awareness of one's experiences, mindfulness can help individuals manage internal and external pressures, reducing feelings of powerlessness and confusion about social norms.^{15,44} Mindfulness can also strengthen the connection between the inner self and the outer world,¹⁵ potentially leading to increased social contact and reduced social alienation for those with higher mindfulness levels. Thus, it's reasonable to suggest that mindfulness may be inversely related to social alienation.

Moreover, individuals who feel alienated from society, and thus from its prevailing expectations, norms, and values, are more likely to display deviant behavior.⁴⁵ This stems from the fact that alienation often fosters feelings of disconnection and erodes confidence in social systems, prompting individuals to act in ways that deviate from normative behavior.²³ Panic buying, for instance, may be interpreted as a coping mechanism in response to the uncertainty and lack of control experienced during the pandemic, as individuals attempt to regain a sense of security through material accumulation. Empirical research has also demonstrated that consumers experiencing high levels of social alienation tend to exhibit a greater likelihood of engaging in irrational purchasing behaviors, including panic buying.⁴⁶ This suggests that social alienation may serve as a mediator between mindfulness and panic buying. Specifically, individuals with higher levels of mindfulness may experience reduced feelings of social alienation, which in turn may decrease their likelihood of engaging in panic buying as a coping mechanism for pandemic-related uncertainty and disconnection.

The Mediating Role of Death Anxiety

Health crises have the potential to precipitate life-threatening illnesses, evoking a pervasive psychological quandary among humans known as death anxiety. This emotional response, stemming from the confrontation with the reality of death, can exert adverse effects on an individual's psychological well-being.⁴⁷ Conversely, mindfulness offers a pathway for individuals to relinquish their fears concerning the future, thereby alleviating some of the detrimental psychological consequences that arise during such crises.²³ Earlier studies have demonstrated that mindfulness is capable of diminishing death-related defensive reactions, including death anxiety.⁴⁸ Furthermore, mindfulness-based interventions have proven efficacious in addressing anxiety and emotional disturbances,⁴⁹ notably decreasing death anxiety levels in adolescent populations.⁵⁰ Consequently, it is logical to hypothesize that mindfulness and death anxiety are negatively correlated.

Terror management theory suggests that people tend to express greater defensiveness when coping with death anxiety, striving to defend or validate their self-worth.²⁴ The pursuit of self-worth, often a compensatory response to reminders of mortality, is closely tied to consumption, which plays a critical role in self-worth construction.⁵¹ Concerns about mortality often stimulate material desires, with this pursuit seen as a reflection of self-worth.⁵² Consequently, people may purchase more items that provide greater security and value. Panic buying, characterized by overbuying and hoarding large quantities of items to enhance self-worth and security,⁵³ can be a defensive response to death anxiety. Recent studies have also indicated that death anxiety associated with the COVID-19 pandemic is a leading psychological cause of panic buying.²³ Therefore, people with higher mindfulness may experience less death anxiety and, consequently, engage in less panic buying.

The Sequential Mediating Role of Social Alienation and Death Anxiety

Mindfulness, which strengthens our connections to the outside world,¹⁵ may lead to lower social alienation in individuals with higher mindfulness, as they realize they are not distanced from society.¹⁴ Terror management theory²⁴ suggests that maintaining ties to social structures and activating cultural beliefs can alleviate death anxiety and its effects on subsequent attitudes and behavior.⁵⁴ Social alienation, reflected in social withdrawal and maladjustment to cultural beliefs, leads to a lack of distal defense mechanisms for death anxiety.⁵⁵ Therefore, students with lower levels of social alienation may experience less death anxiety.

Previous studies have highlighted that social alienation can lead to poor mental representations of the threat of death, such as death anxiety.⁵⁶ Existing literature also demonstrates a significant link between feelings of social alienation and heightened anxiety among adolescents.⁵⁷ Given this evidence, it's plausible to suggest that social alienation and death anxiety may sequentially mediate the linkage between mindfulness and reduced panic buying. In summary, students with higher mindfulness may experience less social alienation, which in turn may lead to less death anxiety and, ultimately, less panic buying.

The Present Study

Using the COVID-19 pandemic as a case study, we investigated the correlation between mindfulness and panic buying, along with the mechanisms underlying this relationship. Our research utilized two-wave data collected from a group of Chinese college students. We employed Structural Equation Modeling (SEM) to validate a multi-mediation model (see Figure 1). This model hypothesizes that both social alienation and death anxiety could individually and sequentially mediate the link between mindfulness and panic buying.

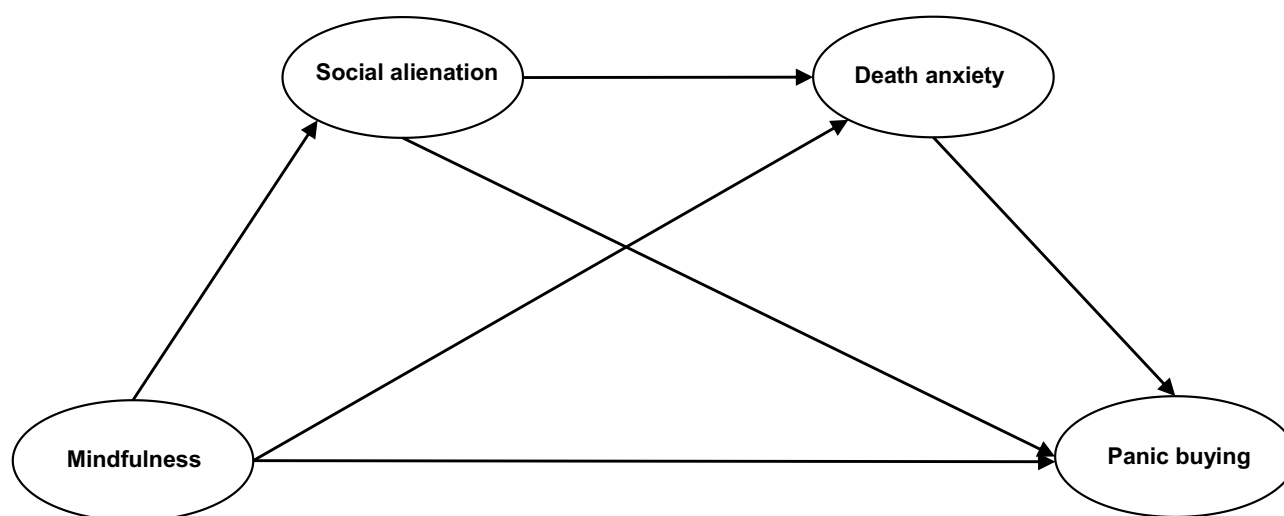


Figure 1 Overview of the proposed multi-mediation model.

Hypothesis 1: Mindfulness will be negatively related to panic buying.

Hypothesis 2: Mindfulness will be related to lower panic buying through decreased social alienation.

Hypothesis 3: Mindfulness will be related to lower panic buying through decreased death anxiety.

Hypothesis 4: Mindfulness will be related to lower panic buying via a sequential process of decreased social alienation and death anxiety.

Materials and Methods

Participants and Procedures

We recruited college students from various universities in Hunan province, China, for this study. Data collection was conducted via the Sojump platform, a renowned survey agency in Mainland China akin to Amazon Mechanical Turk. Data collection occurred at two separate times spaced approximately one week apart to address potential common method bias,^{58,59} aligning with the COVID-19 outbreak in Hunan. Participants were briefed about the study's background and purpose, signed an informed consent form, and were assured of data anonymity before participating.

At Time 1 (T1), with the help of teachers, we shared the link to the online questionnaire with the WeChat groups of three different departments in the university. Moreover, students who filled out the questionnaires were also told that they could send the link to the questionnaire to other students at this university if they wanted to. A week later, at Time 2 (T2), an Email containing study details and the questionnaire link was sent to students who had provided their Email addresses during the first phase. Upon survey completion, participants received a small token of appreciation.

In the initial phase of data collection, 885 participants provided their demographic information and mindfulness levels in the first wave of the survey. Approximately one week later, we collected additional data from the same 885 participants, assessing their levels of social alienation, death anxiety, and panic buying. Of these, 540 questionnaires were returned the following day, resulting in a 61.02% response rate. Each questionnaire was assigned a unique code to facilitate the matching of participants' data between the first and second waves. The final valid dataset comprised 342 questionnaires.

Of the final sample of 342 participants, 241 (70.47%) were women, and 101 (29.53%) were men. They were aged 16 to 26 years ($M_{age} = 20.94$ years, $SD = 1.44$), and 339 (99.12%) were freshmen to senior students. Most families (69.59%) earned 3000–10,000 RMB (about 434–1446 US Dollars) per month, and 75.15% of the participants' monthly living expenses were 1,000–2,000 RMB (about 145–289 US Dollars) per month.

Measures

The survey was administered in Chinese, and all English scales were translated into Chinese by bilingual researchers and then back-translated into English by an independent translator to ensure linguistic accuracy and cultural relevance. Discrepancies between the original and back-translated versions were resolved through discussion among the research team. A preliminary pilot test was performed with 30 Chinese college students to assess the clarity and cultural relevance of the translated scales. Feedback from participants regarding the wording and interpretation of each item was used to make slight modifications, enhancing the scales' clarity and cultural fit. [Supplementary Material](#) lists the main variable measurements.

At T1, the Mindful Attention Awareness Scale (MAAS) by Brown and Ryan (2003),¹⁵ comprising 15 items, was utilized to evaluate mindfulness. An example is "I find it difficult to stay focused on what's happening in the present" (reverse coded). All items are rated on a 6-point Likert scale ranging 1 for "almost never" up to 6 for "almost always". In the current sample, the Cronbach's alpha was 0.88.

At T2, Panic buying was determined using the Panic Buying Intention Scale.⁶⁰ It includes five items, such as "I intend to buy more items than I need during the COVID-19 crisis". Items are rated on a 5-point scale from "strongly disagree" to "strongly agree". Social alienation was assessed using the Adolescent Student Alienation Scale.⁶¹ This scale contains 24 items and is structured by four dimensions: meaninglessness (a sample item is "I often feel a sense of powerlessness"), self-alienation (a sample item is "I feel a sense of distance from myself"), oppression and restraint (a sample item is "I often experience a sense of tension and oppression"), and uncontrollability (a sample item is "I often feel that I cannot control many things"). The items are rated on a 7-point scale from "strongly disagree" to "strongly agree". In the current study, participants' death anxiety was measured using a scale adapted from Templer's Death Anxiety Scale (T-DAS).²² It contains 15 items such as "I am very much afraid to die". All items are rated on a 5-point scale from "strongly disagree" to "strongly agree". The reliability of these three scales was evidenced by a Cronbach's alpha range of 0.84 to 0.94, signifying robust scale reliability within our sample.

Earlier studies indicated that men exhibited greater instances of panic buying compared to women.⁶² Furthermore, a notable positive association was found between the average per capita income and the occurrence of panic buying.⁶³ Therefore, we controlled gender and monthly living expenses in the analysis.

Analysis Strategy

Structural Equation Modeling (SEM) typically requires a minimum sample size of 150,⁶⁴ with 300 being widely regarded as adequate.⁶⁵ The study's sample size of 342 respondents was therefore appropriate for SEM analysis. To determine model fit, four goodness-of-fit indices were utilized: the chi-square to degrees of freedom ratio (χ^2/df), which should be less than 5; the Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI), both of which should surpass 0.90; and the Root-Mean-Square Error of Approximation (RMSEA), which should be under 0.08.⁶⁶

The proposed multi-mediation model was validated with Structural Equation Modeling analyses using AMOS 24.0. We generated indicators using dimensional scores by the item-to-construct balance approach referring to previous research,^{67–69} and created parcels of items for mindfulness, death anxiety, and panic buying intention. Specifically, mindfulness and death anxiety were indicated by three parcels, and two parcels indicated panic buying intention. Further, social alienation was included as a latent factor with four dimensions as the indicators. To examine the total and indirect effects, a bootstrapping approach was employed, utilizing 5,000 bootstrap samples and bias-corrected 95% confidence intervals.

Results

Preliminary Analysis

[Table 1](#) displays the means, standard deviations, and correlations for all variables included in the study. Mindfulness was negatively related to panic buying intention, social alienation, and death anxiety. In addition, social alienation showed positive correlations with both panic buying intention and death anxiety. Death anxiety was also positively associated with panic buying intention. Regarding multicollinearity, the variance inflation factor (VIF) values for all predictor

Table 1 Means, Standard Deviations and Correlations Among Study Variables (N = 342)

Variable	M	SD	AVE	CR	1	2	3	4	5	6
1. Gender	0.3	0.46	–	–	1					
2. Living expenses	2.13	0.88	–	–	–0.18**	1				
3. MAAS	3.74	0.81	0.7	0.88	–0.04	–0.03	1			
4. SAS	4.01	0.94	0.64	0.83	–0.03	–0.13*	–0.48***	1		
5. DAS	3.23	0.62	0.62	0.86	–0.08	–0.04	–0.26***	0.27***	1	
6. PBIS	3.47	0.82	0.77	0.87	–0.02	0.05	–0.35***	0.40***	0.32***	1

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Abbreviations: MAAS, Mindful Attention Awareness Scale; SAS, Social Alienation Scale; DAS, Death Anxiety Scale; PBIS, Panic Buying Intention Scale.

variables ranged from 1.1 to 1.37, well below the threshold of 10.⁷⁰ Similarly, the tolerance values ranged between 0.73 and 0.9, all exceeding the threshold of 0.1.⁷⁰ These results indicate that multicollinearity is not a significant issue in this study.

Results of SEM

The reliability and validity of the measurement model were assessed as a necessary step before evaluating the hypothesized mediation model. The measurement model results showed a satisfactory model fit ($\chi^2/df = 2.81$, CFI = 0.96, TLI = 0.95, RMSEA = 0.07). Additionally, as shown in Table 1, the range of AVE values (0.62 to 0.77) and CR values (0.83 to 0.88) of the four factors are greater than the recommended threshold (0.50 for AVE and 0.70 for CR), and the AVE square roots varied between 0.79 to 0.88, which were higher than all inter-construct correlations.

The hypothesized model demonstrated a good fit: $\chi^2/df = 2.37$, CFI = 0.96, TLI = 0.94, RMSEA = 0.06. The standardized path coefficients (β), standard error (SE), and significance levels for each path are presented in Figure 2.

Hypothesis 1 predicted that mindfulness will be negatively related to panic buying. For mindfulness, $B = -0.15$, with a standardized coefficient $\beta = -0.14$, $t = -2.07$, and $p < 0.05$, indicating a statistically significant effect, meaning that higher levels of mindfulness are associated with lower levels of panic buying. The Bootstrap 95% confidence interval ranges from -0.29 to -0.02 , indicating precise estimation. Moreover, Table 2 showed that the total effect of mindfulness

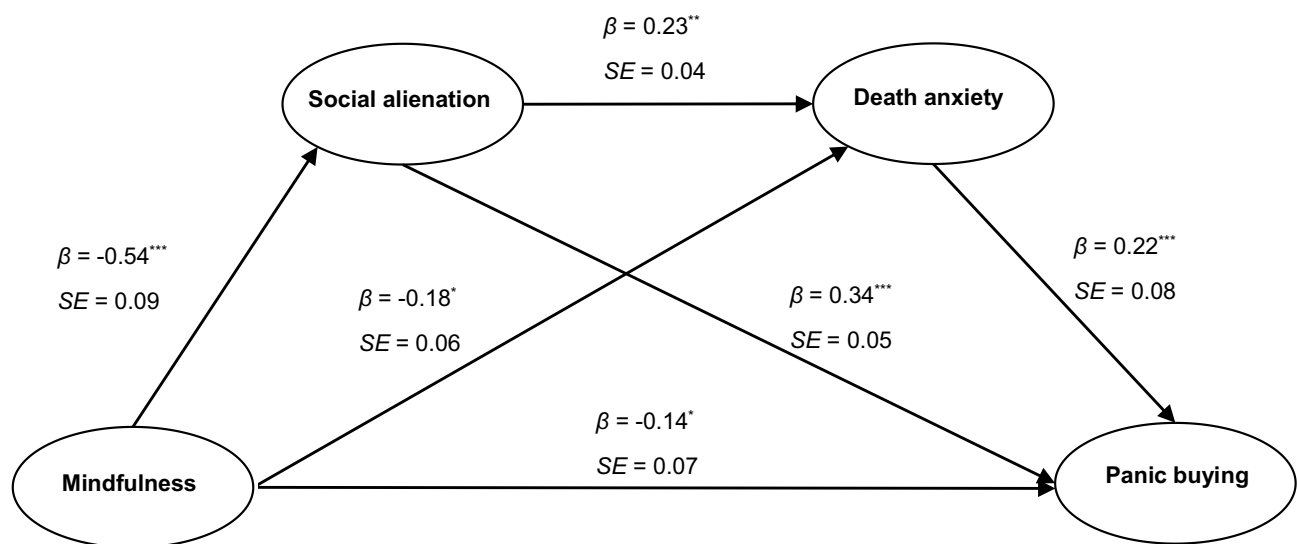


Figure 2 Path analysis results for the hypothesized model.

Note: The model was tested using Structural Equation Modeling. Gender and monthly living expenses were controlled for. In the figure, β represents the standardized regression coefficient, which indicates the strengths of the associations. Values closer to ± 1 indicate stronger associations; SE represents the Standard Error, which directly reflects the precision of the estimated regression coefficients. Smaller values indicate a more accurate estimate of the regression coefficient. Significance levels are indicated as follows: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2 Results of Standard Total and Indirect Effects (5000 Bootstraps)

Path	Effect	SE	LLCI	ULCI
Total effect:				
MAAS → PBIS	-0.39	0.05	-0.48	-0.29
Indirect effect:				
MAAS → SAS → PBIS	-0.18	0.04	-0.27	-0.11
MAAS → DAS → PBIS	-0.04	0.02	-0.09	-0.01
MAAS → SAS → DAS → PBIS	-0.03	0.01	-0.07	-0.01

Abbreviations: MAAS, Mindful Attention Awareness Scale; SAS, Social Alienation Scale; DAS, Death Anxiety Scale; PBIS, Panic Buying Intention Scale.

on panic buying was significant ($effect = -0.39$, $SE = 0.05$, $p < 0.001$, 95% $CI = [-0.48, -0.29]$), and the direct effect was also significant ($effect = -0.14$, $SE = 0.06$, $p < 0.05$, 95% $CI = [-0.26, -0.02]$). This indicates that mindfulness not only directly reduces panic buying but also exerts a stronger overall effect when considering indirect pathways. Hypothesis 1 was fully supported.

Hypothesis 2 and 3 respectively proposed the mediating role of social alienation and death anxiety. For mindfulness, $B = -0.77$, with a standardized coefficient $\beta = -0.54$, $t = -8.94$, and $p < 0.001$, indicating a significant negative predictive effect on social alienation. The Bootstrap 95% confidence interval ranges from -0.94 to -0.61 , indicating precise estimation. For social alienation, $B = 0.24$, with a standardized coefficient $\beta = 0.34$, $t = 4.87$, and $p < 0.001$, indicating a significant positive effect on panic buying. The Bootstrap 95% confidence interval ranges from 0.14 to 0.35 , indicating precise estimation. Moreover, Bootstrapping mediation results in Table 2 suggested that the mediation path “mindfulness → social alienation → panic buying” was significant ($effect = -0.18$, $SE = 0.04$, $p < 0.001$, 95% $CI = [-0.27, -0.11]$), thus Hypothesis 2 was supported. This indicates that mindfulness reduces panic buying by decreasing social alienation, with a significant indirect effect.

In addition, for mindfulness, $B = -0.14$, with a standardized coefficient $\beta = -0.18$, $t = -2.44$, and $p < 0.05$, indicating a significant negative predictive effect on death anxiety. The Bootstrap 95% confidence interval ranges from -0.26 to -0.03 , indicating precise estimation. For death anxiety, $B = 0.29$, with a standardized coefficient $\beta = 0.22$, $t = 3.58$, and $p < 0.001$, indicating a significant positive predictive effect on panic buying. The Bootstrap 95% confidence interval ranges from 0.13 to 0.46 , indicating precise estimation. Moreover, Bootstrapping mediation analysis showed a significant mediation process “mindfulness → death anxiety → panic buying” ($effect = -0.04$, $SE = 0.02$, $p < 0.01$, 95% $CI = [-0.09, -0.01]$), supporting Hypothesis 3. This indicates that mindfulness reduces panic buying by decreasing death anxiety, although the indirect effect is smaller compared to the mediation through social alienation.

Hypothesis 4 proposed a sequential mediating hypothesis. The previous text discussed the negative correlation between mindfulness and social alienation ($B = -0.77$, $\beta = -0.54$, $t = -8.94$, $p < 0.001$), and the positive correlation between death anxiety and panic buying ($B = 0.29$, $\beta = 0.22$, $t = 3.58$, $p < 0.001$). More importantly, the SEM results depicted in Figure 2 showed that for social alienation, $B = 0.13$, with a standardized coefficient $\beta = 0.23$, $t = 2.97$, and $p < 0.01$, indicating a significant positive predictive effect on death anxiety. The Bootstrap 95% confidence interval ranges from 0.04 to 0.23 , indicating precise estimation. Moreover, Table 2 shows that the serial mediation path “mindfulness → social alienation → death anxiety → panic buying” was significant ($effect = -0.03$, $SE = 0.01$, $p < 0.01$, 95% $CI = [-0.07, -0.01]$), suggesting that social alienation and death anxiety could sequentially mediate the association between mindfulness and panic buying. Thus, Hypothesis 4 was supported. The sequential mediation effect, although smaller in magnitude ($effect = -0.03$), highlights the importance of considering both social alienation and death anxiety as mediators in the association between mindfulness and panic buying.

The squared multiple correlations (SMC) or R^2 values for the key outcome variables were 0.31 for social alienation, 0.14 for death anxiety, and 0.30 for panic buying. This suggests that the model accounts for a meaningful proportion of the variance, with 31% explained for social alienation, 14% for death anxiety, and 30% for panic buying. In comparing the strength of the mediation effects, social alienation emerges as the strongest mediator in the relationship between

mindfulness and panic buying, with a significant and moderate indirect effect ($effect = -0.18$). This suggests that mindfulness substantially reduces panic buying by decreasing feelings of social alienation. Death anxiety also plays a significant mediating role, but its indirect effect is smaller ($effect = -0.04$), indicating that while mindfulness reduces panic buying by alleviating death anxiety, this pathway is less pronounced compared to the mediation through social alienation. Finally, the sequential mediation effect, which includes both social alienation and death anxiety, is the smallest ($effect = -0.03$), yet still statistically significant, highlighting the importance of considering both mediators in understanding the relationship between mindfulness and panic buying. These findings provide robust statistical evidence supporting the hypothesized model and highlight the strength of the relationships between the variables.

Discussion

The study focused on understanding how mindfulness influences panic buying during public health crises, with social alienation and death anxiety as potential mediators. Using data from 342 Chinese college students gathered at two stages of the COVID-19 pandemic, the analysis showed that mindfulness significantly and negatively influenced panic buying (supporting H1). These findings suggest that individuals with elevated mindfulness are less inclined to engage in panic buying, especially during periods of widespread crisis like the COVID-19 pandemic.

The results further indicated that social alienation and death anxiety independently and sequentially mediated the relationship between mindfulness and panic buying. Specifically, mindfulness was found to reduce social alienation, which in turn decreased panic buying (supporting H2). Similarly, mindfulness also reduced death anxiety, which further mitigated panic buying (supporting H3). Moreover, mindfulness was shown to decrease social alienation, which in turn reduced death anxiety, ultimately leading to lower levels of panic buying (supporting H4). These findings suggest that mindfulness could be negatively associated with panic buying through three mediating paths: (1) by decreasing social alienation; (2) by reducing death anxiety; and (3) through a sequential mediation of decreased social alienation and death anxiety. Furthermore, the mediating effects decrease in strength across these paths, with the first path being the strongest.

Theoretical Implications

In multiple ways, this study enhances the theoretical comprehension. Firstly, it expands the existing literature on the benefits of mindfulness in consumption contexts. While previous studies have highlighted various positive consumption outcomes linked to mindfulness, such as more sustainable consumption,⁷¹ frugal consumption,⁷² less conspicuous consumption,⁷³ and reduced compulsive buying,⁷⁴ our research complements prior literature on the benefits of mindfulness in consumption contexts and provide a deeper understanding of the role that consumers themselves play in the formation of their consumption behavior. Moreover, it supported and extended the notion of mindful consumption proposed by Sheth et al (2011)⁷⁵ that mindfulness make individuals to be temperance in making consumption choices.

Secondly, our study deepens the understanding of how mindfulness can alleviate panic buying. The results indicate that social alienation and death anxiety independently and sequentially mediate the correlation between mindfulness and panic buying, suggesting a threefold effect of mindfulness in mitigating panic buying behavior. While previous studies have not directly linked mindfulness to panic buying, our research identifies this correlation and offers an in-depth interpretation of the underlying mechanisms. By highlighting the mediating roles of social alienation and death anxiety, our study bridges the gap between social alienation and panic buying and supports previous research indicating that death anxiety can be positively related to panic buying.²³

Moreover, this study elucidates the negative correlation between mindfulness and panic buying by applying terror management theory.²⁴ While previous research has focused on mindfulness as a potential intervention for death anxiety,⁵⁰ Our study contributes to the terror management theory literature by highlighting the mediating roles of social alienation and death anxiety, offering heuristic value for furthering research in this domain,^{76–78} as well as offering significant insights for mindfulness research conducted in the context of a health crisis.^{79–81}

Practical Implications

The findings may offer valuable insights for educational organizations, corporations, and policymakers promoting mindfulness in times of crisis to maintain rational consumer behavior and mental health. Our results suggested that

promoting mindfulness on a broad scale could reduce panic buying. Additionally, mindfulness might also decrease social alienation and death anxiety, both of which are negative experiences for consumers and warrant intervention. A potential focus for future interventions could be to control panic buying by promoting mindfulness, which also contributes to reducing social alienation and death anxiety, thereby enhancing consumer well-being and mental health.

College students, being relatively inexperienced consumers, are susceptible to external environmental influences. To mitigate these effects, universities should consider implementing structured mindfulness-based interventions tailored to the needs of students. Gupta and Verma (2020) demonstrated the effectiveness of short, guided mindfulness meditation sessions in improving mindful consumption among higher education students, universities could integrate similar mindfulness training into their curricula.⁸² For instance, schools could introduce a mindfulness curriculum that includes short, guided meditation sessions (eg, 5–10 minutes) at the end of regular classes. These sessions could be led by trained professionals and focus on enhancing students' awareness of their consumption patterns. Additionally, Plietzsch et al (2024) highlight the importance of scalable and flexible approaches to mindfulness training in higher education.⁸³ Universities could explore blended learning options, such as online mindfulness courses, prerecorded guided meditations, and virtual group discussions, to make mindfulness training more accessible and resource-efficient. These digital formats can be integrated into existing learning management systems, allowing students to practice mindfulness at their own pace while still benefiting from structured guidance.

To further cultivate mindful consumption values and reduce unsustainable behaviors like panic buying, educational organizations could establish a mindfulness education platform or community. This platform could involve collaboration between academics, practitioners, and students, fostering a shared understanding of mindful consumption and promoting sustainable consumer behavior. For example, universities could create mindfulness clubs or online communities where students can engage in regular mindfulness practices, share experiences, and discuss the impact of their consumption choices. These communities could also organize workshops or seminars on topics such as mindful consumption, ethical consumption, and the psychological drivers of panic buying, providing students with practical tools to navigate external stimuli in a healthy and sustainable manner.

Many companies have recognized the importance of mindfulness in corporate practices. Our research offers insights for companies to consider mindful marketing and consumption. Marketers could provide a brief mindfulness meditation within product and brand promotion campaigns or develop mindfulness-based stress reduction programs to reconnect with society and alleviate anxiety and panic buying. For example by sending reminders to “meditate for one minute before shopping” through apps, or by adding rational consumption tips on product pages. This approach could enhance consumers' experience depth, increase their consumption satisfaction, and boost brand loyalty.⁸⁴

The results also suggest that integrating mindfulness-based interventions into public health strategies could help mitigate panic buying by addressing the psychological stressors exacerbated by crises. Specifically, the government could integrate public resources to promote mindfulness interventions for all, and provide policy incentives for companies that actively practice it. It is recommended that government health departments work with universities and businesses to develop free mindfulness training resources (eg the National Mindfulness App) and target them during crises such as epidemics.⁸⁵ Tax incentives or certification rewards for mindfulness interventions, such as including “employee mindfulness participation rates” in corporate social responsibility (CSR) assessment indicators.⁸⁶

Limitations and Future Directions

Our research possesses a number of limitations that could be explored and addressed by future studies. First, while the two-wave survey design offered an advantage over the cross-sectional designs frequently used in mindfulness studies, our study limits our ability to establish causal relationships or capture longitudinal cascading effects among the variables. Future investigations could address this by implementing longitudinal designs to track the evolution of mindfulness, social alienation, death anxiety, and panic buying over time, particularly in both pandemic and non-pandemic contexts. Moreover, the use of self-report measures in our study may have been subject to social desirability bias. Future research could combine self-reports with objective data, such as actual purchasing behavior during crises or third-party observations, to assess mindfulness and panic buying. A combination of diverse methodologies would not only improve the

validity of the findings but also allow for a more comprehensive analysis of the relationship between mindfulness and panic buying behavior.

Second, the sample size of 342, while adequate for the complexity of our model and exceeding the minimum requirements for SEM analysis,^{64,65} may limit the statistical power to detect smaller effect sizes, particularly for mediation pathways. Although our model demonstrated strong fit indices and significant mediation effects, additional research could enhance the robustness of these findings by recruiting a larger and more varied sample, which would contribute to more reliable mediation pathway estimates.

Third, our research focused exclusively on college students, which may constrain the broader applicability of the findings to other populations. While this sample provided a unique perspective during the COVID-19 pandemic, extending future studies to include individuals from different age groups, such as working adults or elderly individuals, would help determine whether the relationship between mindfulness and panic buying remains consistent across diverse populations.

Additionally, given that the data were collected during the COVID-19 pandemic, the extent to which these findings can be generalized to other contexts may be constrained. The pandemic's specific conditions, characterized by heightened uncertainty and fear, may have influenced the levels of mindfulness and panic buying in ways that might not be replicable in other contexts. Moreover, given that this study focused exclusively on neococcal pneumonia in the Chinese context, the broader applicability of its findings may be constrained. Chinese culture values preparedness and has a tradition of hoarding,⁸⁷ and the long period of strict quarantine that China experienced during the COVID-19 pandemic may have made the Chinese more prone to panic buying. Subsequent studies should explore the connection between mindfulness and panic buying across various cultural and crisis contexts.

Lastly, while our study revealed mediating roles of social alienation and death anxiety in the mindfulness and panic buying, its boundary conditions were not discussed. Future research could explore how mindfulness interacts with other socio-psychological factors, such as resilience and community cohesion, in crisis situations. Resilience, for instance, may act as a buffer against the social alienation and death anxiety,^{88,89} potentially moderating the relationship between mindfulness and panic buying. Similarly, community cohesion could enhance social support, reducing feelings of alienation and anxiety during crises.⁹⁰ Exploring these interactions would provide a more holistic understanding of consumer behavior under stress and further enrich the theoretical framework of mindfulness in crisis contexts. Furthermore, while our study demonstrates the overall mediating roles of social alienation and death anxiety, it is possible that the strength of these mechanisms varies across different levels of mindfulness. Future research could explore whether there are threshold effects or diminishing returns at higher levels of mindfulness, which would provide deeper insights into the behavioral implications of mindfulness in crisis situations.

Conclusion

This study advances our understanding of how mindfulness can mitigate panic buying during public health crises, particularly through the mediating roles of social alienation and death anxiety. Our findings reveal that mindfulness not only directly reduces panic buying but also indirectly influences it by decreasing social alienation and death anxiety. The findings of this research enhance the existing literature on the positive effects of mindfulness on consumer behavior, especially during health-related crises. By demonstrating the mediating roles of social alienation and death anxiety, our findings offer a deeper understanding of how mindfulness can mitigate panic buying.

The practical implications of this research are significant. Promoting mindfulness on a broad scale could serve as an effective strategy to reduce panic buying, especially during health crises like the COVID-19 pandemic. Educational institutions and policymakers could integrate mindfulness-based interventions into their programs to help individuals develop greater emotional regulation and resilience, thereby reducing their susceptibility to panic buying. Additionally, companies could incorporate mindfulness practices into their marketing strategies to encourage more sustainable and mindful consumption behaviors among consumers. While this research offers significant contributions, additional studies are required to explore how consumers respond to extraordinary and unforeseen challenges.

Data Sharing Statement

The datasets used or analyzed in this study are available from the corresponding author on reasonable request.

Ethical Approval

All research procedures involving human participants were in accordance with the ethical standards of Business School of Central South University and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The participants provided their informed consent to participate in this study.

Acknowledgments

We would like to express my deepest gratitude to all authors who have supported and contributed to the completion of this research. Special thanks to participants for completing the questionnaire.

Funding

The present research was supported by Hunan Provincial Education Department Foundation for Excellent Youth Scholars (Grant No.24B0265) and Hunan Provincial Social Science Achievement Appraisal Committee Project (Grant No. XSP25YBZ206).

Disclosure

The authors declare that they have no conflicts of interest.

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