

Panic buying research: A systematic review of systematic reviews

S.M. Yasir Arafat^{1*}, Rakesh Singh², Vikas Menon³, Madhini Sivasubramanian⁴, Russell Kabir⁵

1. Department of Psychiatry, Enam Medical College and Hospital, Dhaka-1340, Bangladesh.
2. Department of Research - Transcultural Psychosocial Organization Nepal, Department of Community Medicine and Public Health - KIST Medical College, Kathmandu, Nepal.
3. Department of Psychiatry, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry 605006, India.
4. Department of Public Health and Nursing, The University of Sunderland London, UK.
5. School of Allied Health, Faculty of Health, Education, Medicine, and Social Care, Anglia Ruskin University, Chelmsford, UK.

ABSTRACT

Panic buying is an emerging and ever-evolving phenomenon during emergencies covering several perspectives of life and academic domains. However, it hasn't got adequate attention reflected by a handful number of studies on it. We aimed to assess the systematic reviews that have been performed on panic buying. A search was conducted in PubMed, Scopus, Web of Science Core Collection, and Google Scholar on 30 June 2021, with the search terms "panic buying", "systematic review" using the Boolean function 'AND'. The search was also supplemented by hand searching from the reference lists. We included only systematic reviews on panic buying. We identified and assessed five systematic reviews conducted on panic buying. A major focus in these reviews was psychological factors, precipitating reasons, and the interdisciplinary nature of the phenomenon. The role of social media and social learning have been emphasized in the genesis of panic buying behavior. Panic buying has got recent attention as newer studies are coming out. However, further robust studies are warranted to understand this transdisciplinary construct and therefore, inter-sectoral collaboration in research is required to understand its genesis and prevention strategies.

Keywords: Panic buying, systematic review, hoarding, perspectives, COVID-19, pandemic

Address for correspondence:

Dr. S.M. Yasir Arafat
Department of Psychiatry,
Enam Medical College and Hospital, Dhaka-1340
Email: arafatdmc62@gmail.com

INTRODUCTION

The Panic buying (PB) is a real and serious issue which is faced by almost everyone in the current time across the globe. It has been considered as a behavioral phenomenon generally guided by negative feelings, such as fear and panic, and generally precipitated by some crisis or disruptive events like disasters or public health emergencies [1,2]. More specifically, PB is a consumer behavior, usually occurring due to feelings of uncertainty, influencing an individual to buy things in quantities more than usual [3]. The history reports several incidences of PB, for example, PB during an outbreak of Severe Acute Respiratory Syndrome (SARS) in China in 2003 [4], and PB of salt in 2011 after the Japanese earthquake [5]. However, PB became a profound phenomenon globally after the spread of the coronavirus disease, COVID-19 pandemic [6,7]. The pandemic is uncertain regarding its length due to which an individual could start getting worried regarding the availability of sufficient food and other necessary supplies. On the one hand, due to the wide and easy spread of (mis)information through social media, PB got noticed as a universal phenomenon [7]. On the other hand, social media itself have triggered a sense of fear among people to get more involved in PB and store things for the future [8]. As an act of self-preservation to cope with uncertainty during adverse situations, people indulge themselves in PB as a reaction to distress due to a perceived sense of losing control towards future demands [9-12].

There is frequent reporting from different corners of the world regarding increased PB since the COVID-19 pandemic and with this there evolved growing concerns of its consequences, especially on the high-risk population of both high-income-countries (HICs) and low-and-middle income countries (LMICs) due to underlying socioeconomic inequalities. Henceforth, to control PB various studies have proposed different strategies such as responsible media reporting, raising awareness, rationing, products substitution, and strict market regulations [7,13-16]. For an instance, under the unusual market circumstances

of the pandemic, food preferences will depend on the availability of the commodities and restrictions on the quantity of commodities that a consumer can buy [15].

Understanding PB from comprehensive dimensions is a priority to prevent this unpredictable and unusual purchasing behavior. These dimensions include, but are not limited to, academic context, market, business, health, healthcare, and policy-making. Moreover, for the prevention of PB, it is mandatory to conceptualize the phenomenon and its evolving nature from all connected disciplines. For this, reviews of researches on PB and having up-to-date information of their findings are necessary in order to identify research gaps and future direction and to recommend policy implications on its consequences and controlling.

Recently, there have been reviews conducted on PB by various researchers across the globe, but mostly all of them are targeted in different disciplines of panic buying and none have included every cornerstone of this behavioral phenomenon. By conducting this systematic review to create a summary of systematic reviews of panic buying fragmented across various dimensions, this study intends to contribute with synthesized evidence easily accessible to decision-makers from all concerned disciplines including healthcare, education, marketing, and finance to help better understand the behavioral reactions of panic buying as an impact of uncertainty and to promote effective prevention and policies aiming to manage it. Based on this background for this emerging area, we aim to synthesize findings from available systematic reviews, identify gaps in the literature and suggest future research directions.

MATERIALS AND METHODS

Search strategy

A search was performed in PubMed, Scopus, Web of Science Core Collection, and Google Scholar on June 30, 2021, with the search terms “panic buying”, “systematic review” using the Boolean

function ‘and’. The search was also supplemented by hand searching from the reference lists. Initially, at the screening stage, the titles and abstracts were evaluated. Due to lack of clarity from the titles and abstracts, the full-text papers were retrieved for confirmation and subsequently, two researchers assessed the eligibility of the full-text articles for inclusion.

Inclusion criteria

We included systematic reviews on panic buying published in the English language from inception to the search date.

Exclusion criteria

Traditional literature review on panic buying (ii) scoping and narrative review on panic buying (iii) nonsystematic reviews and (iv) and articles published in other languages were excluded.

Data extraction and Quality Appraisal

We identified five systematic reviews of panic buying after excluding the duplicates and articles on other variables. The stepwise search details are mentioned in figure 1. The selected review articles were evaluated using the Critical Appraisal Skills Programme Systematic Review Checklist [17]. The quality appraisal findings are presented in table 1. Data were extracted with the help of the Microsoft Excel spreadsheet 2010 version. The extracted variables are presented in table 2.

Data Analysis

The findings of the reviews were analyzed by qualitative synthesis.

Permission

As we reviewed the already published studies, no

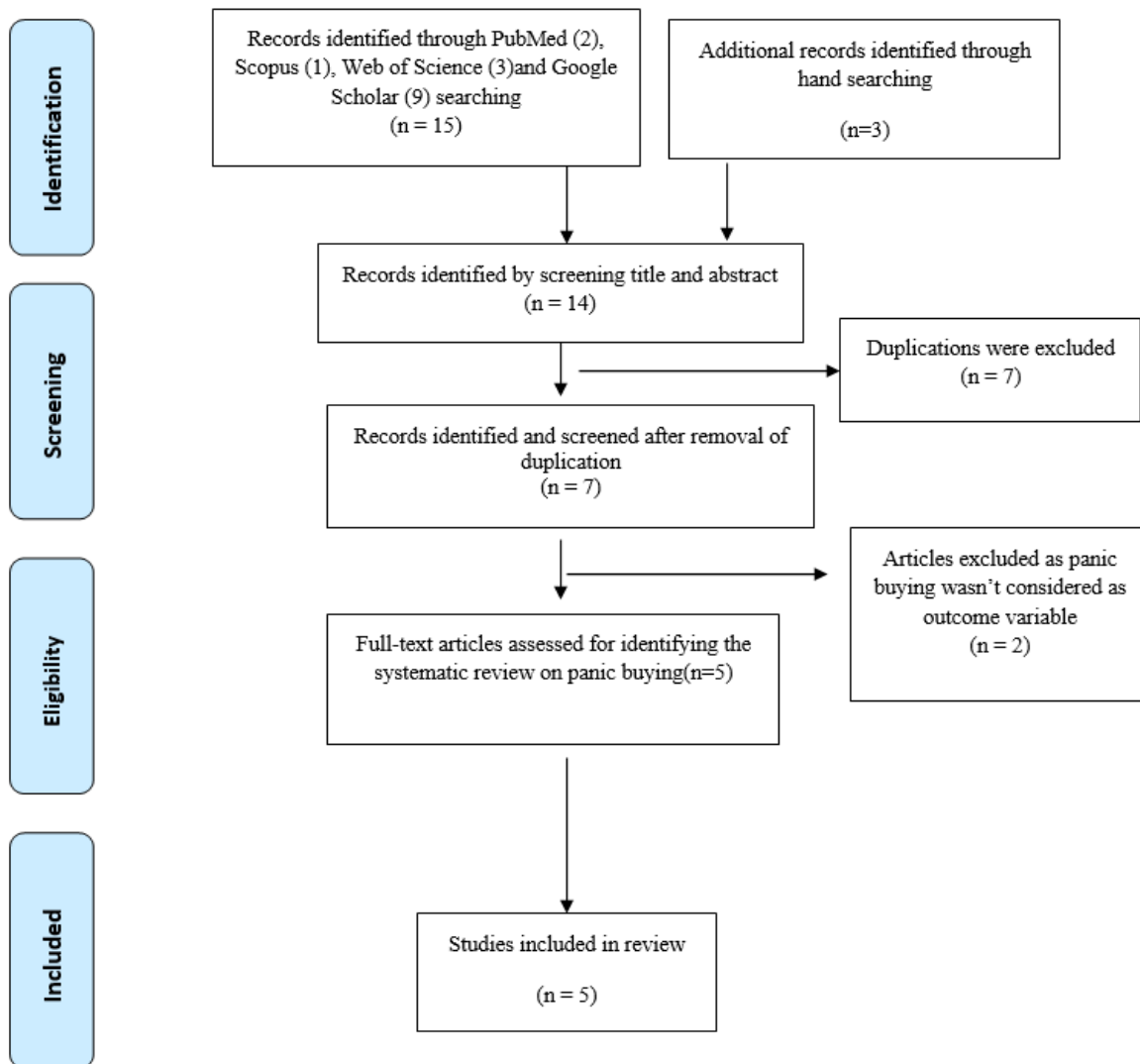


Table 1. Critical appraisal of included studies using the Critical Appraisal Skills Programme (CASP) tool Systematic Review Checklist

Reference	Did the review address a clearly focused question?	Did the authors look for the right type of papers?	Do you think all the important, relevant studies were included?	Did the review's authors do enough to access the quality of the included studies?	If the results of the review have been combined, was it reasonable to do so?	What are the overall results of the review?	How precise are the results?	Can the results be applied to the local population?	Were all important outcomes considered?	Are the benefits worth the harms and costs?
Miri et al 2020	+	+	+	-	+	-	-	+	+	+/-
Billore and Anisimova, 2021	+	+/-	+/-	+	+	+	-	+	+/-	-
Labad et al, 2021	+	+	+	+/-	+	+	-	+	-	+/-
Arafat et al 2020	-	+	+	+	+	+	-	+	-	+/-
Yuen et al, 2020	+/-	+/-	+/-	+	+	+	-	+	-	+

+ = item adequately addressed, - = item not adequately addressed, +/- = item partially addressed

Table 2. List of articles

SN	Study	Date of Publication	Title	Journal	No of the articles reviewed	Objectives	Key domain	Summary findings	Limitations
1	Billore and Anisimova, 2021 [18]	18-Mar, 2021	Panic buying research: A systematic literature review and future research agenda	International Journal of Consumer Studies	n=53 11 paper on secondary data 9 paper with quantitative method 5 qualitative study 3 literature review 3 conceptual 4 mixed methods 2 Multi studies 4 commentary 1 Social network analysis 1 observation 1 case study	What do we know about panic buying in an academic context? Where is the research happening? How was the research conducted? Why should academicians, practitioners, and policymakers know more about panic buying?	Panic buying research	This paper underpins 4Ws and systematically analysed a variety of themes and the discussion sheds light on important issues. This systematic review tackles important aspects of panic buying and suggests what needs to be done and why such as retailer perspectives, consumer perspectives, crisis management, policy-making, and broader societal impacts.	The review followed a systematic search; some of the new studies were not included.
2	Labad et al., 2021 [19]	29-Jan, 2021	A systematic review and realist synthesis on toilet paper hoarding: COVID or not COVID, that is the question	PeerJ	n=14 6 case reports – pathological use or hoarding of toilet paper and mental health outcome (secondary outcome) 8- Primary outcome –toilet paper hoarding	To explore whether the coronavirus disease 2019 (COVID-19) pandemic is associated with toilet paper hoarding and to assess which risk factors are associated with the risk of toilet paper hoarding.	Behavioral	The systematic review looked into primary and secondary outcomes and looked specifically at 6 case reports with existing toilet paper hoarding. Interestingly of they were associated with the COVID-19 pandemic. The realist review suggested that of all the mechanisms, social cognitive biases and a bandwagon effect were potential contributors to toilet paper hoarding in the general population. The stressful	Small number of studies are included, main focus of the study was to evaluate the toilet paper hoarding instead of core panic buying.

3	Arafat et al., 2020 [6]	28-Dec, 2020	How far has panic buying been studied?	World Journal of Meta-Analysis	n=42 27 original 6 correspondences 3 review article 3 commentaries	The study assessed the distribution of studies that have been conducted on panic buying	Panic buying research	situation (COVID-19 pandemic) and some personality traits	The search was conducted by a single first author. Quality assessment of the studies was not performed.
4	Yuen et al., 2020 [20]	18-May, 2020	The Psychological Causes of Panic Buying Following a Health Crisis	International Journal of Environmental Research	n = 27 Perception 7 perceived threat 8 perceived scarcity 10 Fear of the	This paper was aimed to identify, categories and synthesize the psychological attributing	Psychological perspectives of panic buying	The review suggest that panic buying is attributed by four psychological reactions i.e. (1) perceived scarcity and threat of the health crisis (2) fear of unknown, triggered by negative emotions and	It was conducted during the early phase of pandemic (15 March 2020) and search was

5	Miri et al., 2020 [21]	16-Mar, 2020	Panic of Buying Toilet Papers: A Historical Memory or a Horrible Truth? Systematic Review of Gastrointestinal Manifestations of COVID-19	and Public Health	unknown 6 Coping behavior Social Psychological factors 8 Social Influence 6 Social trust	factors of panic buying.	uncertainty (3) coping strategy to reduce anxiety and gain control over the crisis and (4) social psychological factors mentioned as social influence and social trust. It attempts to understand the psychology and motivations of panic buying, this study also looks into implications of service provision and healthcare professionals, policymakers in view of mental health impact. Also, retailers' response to panic buying in view of policies and strategies to curb panic buying.	done only in Scopus.
					10	Is there any strong relationship between COVID-19 infection and gastrointestinal tracts symptoms?	Behavioral This systematic review looks into a completely different lens of panic buying. They have looked into gastrointestinal signs and symptoms associated with Covid 19. This is really interesting but couldn't find the connection between panic buying and the gastrointestinal signs and symptoms.	It assessed the gastrointestinal symptoms of the COVID-19 pandemic whilst panic buying of toilet papers was attributed by the symptoms. The core panic buying concept was not studied.

formal ethical approval was sought.

RESULTS

We identified five systematic reviews published in 2020 (n=3) and 2021 (n=2) (Table 2). Among these five articles, two studies discussed the toilet paper hoarding behavior due to the different symptoms of COVID-19 infection [19,21]; two studies assessed the distribution of research conducted on panic buying and potential research gaps [6,18]; and one study systematically assessed the psychological factors of panic buying [20] (Table 2). The number of studies assessed in the systematic reviews varies from 10-53 (Table 2) whilst more recent articles included the maximum number of papers indicating that more articles are coming out during this pandemic [6]. Two articles explained the behavioral perspectives of panic buying [19,21], other two studied the research spectrum of panic buying [6,18], and the rest one discussed the psychological factors of panic buying [20] (Table 2).

DISCUSSION

Main findings

We assessed five systematic reviews on panic buying (Table 2). Our systematic search didn't identify systematic reviews before 2020 signifying that the problem has got attention during this COVID-19 pandemic. Three of the five available reviews have focused on summarizing the psychological theories of panic buying [6,18,20]. Stressful situations, fear of contagion (during the pandemic), personality traits such as conscientiousness, the perceived scarcity of commodities, perceived threat of looming health crisis, and social factors such as influence and social trust were identified as major factors attributing to PB. Fear of the unknown, owing to the uncertainty caused by disasters such as pandemic, may trigger coping strategies such as panic buying aimed at achieving management strategies to respond to the situation.

The other major area that was focused upon was the precipitating factors for panic buying behavior among the public. The relevant factors identified

were the role of social media in spreading fear and panic related to the COVID-19 outbreak, demand and supply mismatch, social cognitive bias (also called the bandwagon effect, a phenomenon wherein the rate of adoption of beliefs increases proportional to adoption by others), social learning, lack of trust in the government of the day, and prior experience.

Two reviews focused their efforts on the phenomenon of toilet paper hoarding during the COVID-19 pandemic [19,21]. One of them compared such behavior with a previous infectious pandemic (SARS) and found that COVID-19 produced fewer gastrointestinal symptoms before respiratory symptoms. The authors argue that the panic buying of toilet paper could be due to gastrointestinal symptoms or due to the historical memory of earlier infectious pandemics [21]. The other review specifically explained toilet paper hoarding based on the role of social media and social-cognitive biases as explained earlier, which may also explain differences in such behavior across cultures and settings [19].

There are 3 systematic reviews focused and addressed their chosen questions (18,19,20) and the other two systematic reviews were not focused in answering the question (6,20). All the reviews were included important studies, however none of the studies were able to produce a precise results they were intended to (6, 18, 19, 20, 21). We believe this is because the complexity of the findings which lead to making the conclusions even more complex. This is apparent as one systematic review (18) has proposed future research in number of areas after reviewing and thematically analyzing 12 articles which focused on retailer perspectives and 41 articles focusing on consumer perspectives

All the five systematic reviews were able to conclude their results which are applicable to the local population. Two of the systematic reviews paid much attention in important outcomes of their systematic review (18, 21).

What is already known

Panic buying is an emerging phenomenon that gets prominent attention during the COVID-19 pandemic evident by the increased number of

articles. However, as the behavior shares a wide overlap with several disciplines and happens during emergencies, comprehensive knowledge in every aspect is yet to be synthesized.

What this study adds

This review identified only five systematic reviews that signify the necessity of further studies to explain the behavior and synthesize comprehensive knowledge. The first systematic review was published in 2020 prompts the earlier inattention in the behavior. Additionally, no systematic review was identified discussing the prevention that warrants the global attention to rein it.

Implications

Panic buying is a transdisciplinary phenomenon that spans fields as diverse as social psychology, disaster preparedness, supply chain management, economics, engineering, consumer behavior, marketing, and media. This is also reflected in the diversity of disciplines of the authors who have contributed to the limited research output in this field; the list is long and includes fields ranging from psychiatry, economics, business, business administration, consumer behavior, public health, sociology, engineering, business administration, psychology, health economics, epidemiology, and community health. However, this may also imply that research in this field is challenging because of the need for multidisciplinary collaboration.

Panic buying, traditionally, has been studied during periods of crisis or external emergencies. This may not bring in data from meaningful diverse contexts. There is a need to systematically study the phenomenon against established theoretical frameworks [22]. On the basis of the information in studied reviews, a stress-diathesis model can be proposed for panic buying. Specifically, individuals with certain personality characteristics such as low levels of conscientiousness appear to be vulnerable to panic buying. Such individuals, when faced with a stress or emergency which triggers fear and uncertainty, may resort to panic buying to cope with and attempt to establish a degree of control over the situation. These maladaptive behaviors can be accentuated by social phenomena such as bandwagon effect and social learning.

A key implication of the present review pertains to the role of social media as a population level prevention strategy to control panic buying. Media can play a dual role in increasing or decreasing the risk of panic buying; reports carrying photographs of empty supermarket shelves may trigger further behavior while responsible media reporting can modify social behavior and cognition. Specifically, from a theoretical perspective, many of the psychological theories highlighted in the included reviews such as a perceived sense of scarcity, social learning, need for control over perceived uncertainty are all amenable to some degree of modification through balanced and responsible media reporting. The stress-diathesis model of panic buying that we have proposed also provides some avenues for preventive or management strategies for panic buying. These include dissemination of accurate information about the emergency situation and measures taken to contain the demand-supply mismatch (that can alleviate uncertainty and perceived shortage of commodities), providing information on support services or helplines that the public can contact for assistance and information related to supply of essential items, and targeting such interventions to vulnerable areas such as those with high rates of unemployment or civil strife.

Recommendations

It is essential that the policymakers need to know about the internal and external factors which might cause this phenomenon. The perceived scarcity, fear of the unknown, and peer pressure are all part of the reason for the panic buying. We could suggest that the data on wartime consumer behavior could be closely related to this pandemic-influenced consumer behavior. Knowing the patterns and the essential products such as milk, medicine, and toilet rolls could be helpful for businesses to be prepared to meet the demands. However, it needs to be recognized that there is no real macro demand.

Much of the available reviews have focused on trying to provide a coherent formulation of the phenomenon from a psychological or social-cognitive learning theories. This is reflective of the

thrust areas in ongoing research into panic buying. However, several authors have emphasized the role of media as well as governmental initiatives and policies on curbing the phenomenon [23,24]. This must be systematically studied to identify best practice elements of such interventional approaches. Further, there is a need to move to participatory action research in panic buying that aims to solve problems while eliciting views of stakeholders. This will promote collaborative inquiry and generate data that will inform policy making and prevention strategies.

Limitations and strengths

This is the first review of the systematic review on panic buying. However, the review has several limitations. Firstly, it includes articles published in the English language that may exclude some papers. Secondly, panic buying wasn't the major focus of the two articles. Thirdly, the number of papers is relatively small. Fourthly, the search was performed in the early half of 2021 which may exclude recent systematic reviews.

CONCLUSIONS

Panic buying has got recent attention as newer studies are coming out. However, further robust studies are warranted to understand this transdisciplinary construct and therefore, inter-sectoral collaboration in research is required to understand its genesis and prevention strategies. Proper planning, based on knowledge of consumer behavior patterns, coupled with clear and decisive government action in maintaining supply chains of essential commodities and reducing fear-mongering may be useful in curbing the menace.

Acknowledgments: None

Declaration of conflicting interests: None.

Funding: None.

REFERENCES

1. Arafat SMY, Kar SK, Menon V, et al. Responsible Factors of Panic Buying: An Observation From Online Media Reports. *Front Public Health*. 2020, 8, 603894.
2. Shoib S, Arafat SMY. Behavioural Perspectives of Panic Buying In: Arafat et al., editor. *Panic Buying: Perspectives and Prevention*. Springer.2021; 1-12.
3. Arafat SMY, Kar SK, Menon V, et al. Panic buying: An insight from the content analysis of media reports during COVID-19 pandemic. *NeurolPsychiat Br*. 2020, 37, 100
4. Ding, H., 2009. Rhetorics of alternative media in an emerging epidemic: SARS, censorship, and extra-institutional risk communication. *Tech. Commun. Q*. 18 (4), 327–350.
5. Wei, K., Wen-wu, D., Lin, W., 2011. Research on emergency information management based on the social network analysis—a case analysis of panic buying of salt. In: 2011 International Conference on Management Science & Engineering 18th Annual Conference Proceedings. IEEE, pp. 1302–10.
6. Arafat SMY, Hussain F, Kar SK, Menon V, Yuen KF. How far has panic buying been studied? *World J Meta-Anal* 2020, 8, 446-460. 10.13105/wjma.v8.i6.446
7. Singh, C.K., Rakshit, P., 2020. A critical analysis to comprehend panic buying behaviour of Mumbaikar's in COVID-19 era. *Stud. Indian Place Names*40 (69), 44–51.
8. Arafat SMY, Ahmad AR, Murad HR, Kakashekh HM. Perceived Impact of Social Media on Panic Buying: An Online Cross-Sectional Survey in Iraqi Kurdistan. *Front Public Health*. 2021, 9, 668153.
9. Arafat SMY, Kar SK, Marthoenis M, et al. Psychological underpinning of panic buying during pandemic (COVID-19). *Psy Res*. 2020,289, 103061.
10. Fransen, M.L., Arendsen, J., Das, E., 2019. Consumer culture as worldview defense: a terror management perspective. In: *Handbook of Terror Management Theory*. Academic Press, pp. 485–512.
11. Sneath, J., Lacey, R., Kennett-Hensel, P., 2009. Coping with a natural disaster: losses,

- emotions, and impulsive and compulsive buying. *Market.Lett.* 20, 45–60.
12. Sim K, Chua HC, Vieta E, Fernandez G. The anatomy of panic buying related to the current COVID-19 pandemic. *Psychiatry Res.* 2020, 288, 113015.
 13. Arafat SMY, Kar SK, Kabir R. Possible Controlling Measures of Panic Buying During COVID-19. *Int J Ment Health Addict.* 2021, 19(6), 2289-91.
 14. Alfa, A.B., Gomina, M.O., 2020. Effect of Panic Buying on Individual Savings: The Covid-19 Lockdown Experience. *Lapai J Econ.* 4, 69-80.
 15. Martin-Neuning R, Ruby MB (2020). What Does Food Retail Research Tell Us About the Implications of Coronavirus (COVID-19) for Grocery Purchasing Habits?. *Front Psychol.* 11, 1448.
 16. Rosita R (2020). Panic Buying In TheCovid–19 Pandemic Era In Indonesia. *Inter J Multi Sci .1*, 60-70.
 17. CASP .2018. Critical Appraisal Skills Programme Systematic Review Checklist. [Online] Available from: https://casp-uk.b-cdn.net/wp-content/uploads/2018/03/CASP-Systematic-Review-Checklist-2018_fillable-form.pdf [Accessed on 01/08/2021]
 18. Billore S, Anisimova T. Panic buying research: A systematic literature review and future research agenda. *Int J Consum Stud.* 2021, 45(4), 777-804.
 19. Labad J, González-Rodríguez A, Cobo J, Puntí J, Farré JM. 2021. A systematic review and realist synthesis on toilet paper hoarding: COVID or not COVID, that is the question. *PeerJ* 9, e10771
 20. Yuen KF, Wang X, Ma F, Li KX. The psychological causes of panic buying following a health crisis. *Int. J. Environ. Res. Public Health.* 2020, 17(10):3513.
 21. Miri SM, Roozbeh F, Omranirad A, Alavian SM. Panic of buying toilet papers: a historical memory or a horrible truth? Systematic review of gastrointestinal manifestations of COVID-19. *Hepatitis Monthly.* 2020;20(3)
 22. Loxton M, Trusket R, Scarf B, Sindone L, Baldry G, Zhao Y. Consumer behaviour during crises: preliminary research on how coronavirus has manifested consumer panic buying, herd mentality, changing discretionary spending and the role of the media in influencing behaviour. *J. Risk Financial Manag.* 2020, 13(8), 166.
 23. Keane M, Neal T. Consumer panic in the COVID-19 pandemic. *J Econom.* 2021;220(1):86-105.
 24. Sailer M, Stadler M, Botes E, Fischer F, Greiff S. Science knowledge and trust in medicine affect individuals' behavior in pandemic crises. *Eur J Psychol Educ.* 2021:1-4.