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Exploring the relationships between social media misinformation, rumors, and panic buying as a social practice during the COVID-19 pandemic

Abstract

Purpose

The major motivation of this study is to understand how socially shared misinformation and rumors can enhance the motivation to protect personal interests and enhance social practices of panic buying.

Method

This study employed a number of qualitative data collection methods for the purpose of triangulation as it can offer thick interpretation and can help to develop a context specific research framework.

Findings

The shared misinformation and rumors on social media developed into psychological, physical, and social threats; therefore, people started panic buying to avoid these negative consequences. People believed that there were differences between the information shared by politicians and government officials and reality, such as "everything is under control", whereas social media showed people standing in long queues and struggling to buy the necessities of life. The shared misinformation and rumors on social media became viral and received social validation, which created panic buying in many countries.

Implications

It is the responsibility of government, politicians, leaders, media, and the public to control misinformation and rumors as many people were unable to buy groceries due either to socio-economic status or their decisions of late buying, which increased depression among people.

Originality

This study merged the theory of rumor transmission and protection motivation theory to understand how misinformation and rumors shared through social media increased global uncertainty and the desire to panic buy across the world.

Keywords: social media, credibility, information, misinformation, online rumor, social constructionism.

Introduction

The COVID-19 outbreak brought challenges for governments across the world, including the high use of social media by individuals who disseminated misinformation that influenced others' routine decision making (Mirbabaie et al., 2020). The usage of social media increased at a local and global level because of social distancing rules (Arsua, 2020). The use of social media and the volume of false rumor sharing increases in global emergencies (Reuter et al., 2019). In crisis situations, many people want to get more information so that they can take proactive and rational decisions (Barua et al., 2020; Islam et al., 2020). However, during the COVID-19 pandemic there was a surge in the spread of hoaxes, rumors, and misinformation through social media platforms (Arsua, 2020; Wiener-Bronner, 2020). For example, Alaska publicly confirmed its first case of COVID-19 on March 12, 2020 and at the same time a rumor spread on social media that the port of Seattle was closing down due to COVID-19 in Alaska (Rose, 2020). Consequently, people in Sitka, Alaska, rushed to stores and filled grocery carts because of the uncertainty and urgency; however, their actions were based on misinformation

because only a few ships in Seattle were non-operational and that was due to technical reasons (Rose, 2020). In another example, the *Louisville Courier Journal* (Kentucky, USA) debunked rumors circulating on social media that people standing in long queues outside gas stations and grocery stores were robbed at gunpoint during the COVID-19 pandemic; it reported that no incident had been recorded by the Louisville local police (*Louisville Courier Journal*, 2020). However, this rumor created fear and uncertainty and many people were concerned about government and police performance (*Louisville Courier Journal*, 2020). The people of Louisville shared their thoughts through social media by suggesting that they should buy more necessities of life as government is unable to protect them during unprecedented situation (Louisville Courier Journal, 2020).

Although many politicians and government authorities from different countries told their citizens there is no need to panic buy, people shared evidence on social media of long queues and empty shelves. In the UK, people shared pictures on social media of empty supermarket shelves, indicating that there was no toilet paper, paper towels, hand sanitizer, cereal, canned goods, bread, meat, or milk (Wiener-Bronner, 2020), the shared pictures increased anxiety and extra buying of alternative products (Naeem, 2020). Social media users also posted messages in which they stated they were buying more to deal with the worsening situation and uncertain future, which added fuel to the fire (Hanbury, 2020). There was viral misinformation that sources from hospitals confirmed that groceries can spread COVID-19 (Arsua, 2020), therefore, people should buy in bulk.

There is also evidence that many small businesses were negatively affected by rumors, for example, a small grocery store in Canada lost sales because someone spread a rumor on social media that many employees of this store were infected with COVID-19 (Froese, 2020). After the circulation of this rumor, the store management received hundreds of messages and calls in which people asked should they go into isolation because they had visited that store to buy groceries (Froese, 2020). There was another viral story on social media in which people were concerned regarding a person who broke the quarantine and visited a grocery store, which increased anxiety and stress among customers (Heath, 2020).

There is literature from various perspectives on the role of social media during the COVID-19 pandemic, such as misinformation sharing (Islam et al., 2020), fake news (Pennycook et al., 2020), policy making (Pennycook et al., 2020), digital health strategies (Fagherazzi et al., 2020), socialization (Apuke and Omar, 2020), self-disclosure (Nabity-Grover et al., 2020), and changes in food consumption behavior (Laguna et al., 2020). Furthermore, studies from different perspectives were conducted on the effects of COVID-19, such as beyond panic buying (Hall et al., 2020), people's well-being (Henkel et al., 2020), conceptualization of people engagement (Karpen and Conduit, 2020), unusual purchase behavior (Laato et al., 2020), e-commerce platforms (Tran, 2020), retailers' circumstances (Pantano et al., 2020), marketing philosophy (He and Harris, 2020), but these studies did not highlight how misinformation and rumors through social media can change customers' rational decision making into panic buying behavior. Although there is literature on social media and panic buying (Islam et al., 2021; Naeem 2021; He and Harris, 2020), it did not provide understanding of how misinformation and rumor on social media led to socially motivated panic buying practices. Therefore, the present study intends to explore why the circulation of misinformation and rumors changed the buying practices of customers and why they started buying extra groceries.

The major motivation of this study is to understand how socially shared misinformation and rumors can enhance the motivation to protect personal interests and enhance social practices of panic buying. The researchers intend to determine the causes of physical, social, and psychological threats during COVID-19 that changed rational buying decisions into panic buying. The primary contribution of this study is to develop a research framework based on the findings of this study with the support of relevant theory, which can provide understanding regarding how misinformation and rumors change the buying practices of customers and why they start to buy extra groceries. Theoretically, this study ultimately proposes a holistic framework for conceptualizing how social, physical, and psychological threats can change rational behavior into panic buying behavior among people across the world. Our holistic framework adds to the existing literature on social media misinformation, rumors, and panic buying by giving theoretical underpinnings to

the phenomena. The findings of this study can provide practical guidance to retailers and government stakeholders regarding why there is a need to control misinformation and rumors on social media. Furthermore, the findings can help governments and marketers work together to specify policies to control the accuracy of socially shared communication so that consumers can make rational choices, especially in an unprecedented situation.

Literature review

The increasing use of social media platforms plays a significant role in facilitating peer confirmation of content, such as re-tweets, likes, share, and following (Liu et al., 2019; Harmeling et al., 2017). The use of social media enhances information creation and the exchange process, which ultimately enhances the involvement and engagement of a large number of people at a local and global level (Grover and Kar, 2020; Shawky et al., 2020; Shirazi, 2013). In this regard, a study reported that more than 71% of consumers make their purchases on the basis of suggestions from their social networks. However, the credibility of information that is shared via social media platforms is questionable (Reuter et al., 2019; Pal et al., 2019, 2020). The credibility of shared information over social media strongly influences responses toward the shared information. Therefore, many scholars proposed that credibility evaluation is one of the most important determinants of people's behavior (Pal et al., 2020). Moreover, information credibility in the context of mass media is comprehended better than in the context of social media, because an evaluation of source credibility on social media is a challenge because users are publishers (Wang et al., 2019). This indicates the importance of the source of information to the evaluation of the credibility of the information (Benson et al., 2015; Moran and Muzellec, 2017).

The use of social media increases in global emergencies, such as floods, earthquakes, hurricanes, and tsunamis (Gaspar et al., 2019; Li et al., 2019; Reuter et al., 2017). There is evidence that people pay more attention to rumors in an unprecedented situation (Barua et al., 2020; Pennycook et al., 2020). This study is grounded in the theory of rumor (TORT) which was introduced by Prasad (1935) and Buckner (1965). Prasad (1935)

conducted a detailed study of the creation and transmission of rumors. He proposed that the existence of anxiety is required for rumor to spread (Prasad, 1935; Bordia and DiFonzo, 2002). Social media rumors provide answers and a sense of meaning when circumstances do not allow control and clear understanding, particularly when it is difficult to verify the issues concerned (Oh et al., 2013). Misinformation and rumors persist only when the subject matter is important to members of the transmitting group (Oh et al., 2013). Noymer (2001) described rumor transmission as a natural form of social communication. In recent studies, sociologists argued that opinions, predictions, and explanations within groups are exchanged until an acceptable interpretation of the believability and content of the rumor emerges (Bordia and Rosnow, 1998). However, it is not clearly understood how rumors spread via social media can change rational buying decisions into panic buying behavior, as during the COVID-19 pandemic.

The study of Berinsky (2017) highlighted that rumors lack evidence to prove the shared news. The study of Pal and Banerjee (2019) highlighted that online rumors have unproven content that is disseminated on the internet. If the source of online rumors is unknown, then these online rumors might be shared to achieve personal or political objectives (Chiluwa and Samoilenko, 2019). Chua and Banerjee (2018) found that personal involvement and relevance of rumors can increase their dissemination. Liu et al. (2019) stated that the use of social media increased the generation and dissemination of rumors, which has now become a social problem for the social world. For example, on April 23, 2013, a hacker released the rumor of an explosion in The White House, USA, and the ensuing social panic led to 14 points and 145 points decrease in the SandP 500 Index and Dow Jones Industrial Average, respectively (Liu et al., 2019).

The highly recognized study of Shin et al. (2018) described the differences among misinformation, disinformation, and rumors. For example, *"misinformation is agnostic regarding the motivation of falsehood, whereas disinformation assumes that inaccuracy stems from deliberate intention"* (Shin et al., 2018, p. 7). Misinformation is usually understood as a false claim, whereas rumor is defined as information that is usually not confirmed (i.e., either false or not false) by any reliable source (Shin et al., 2018, p. 7).

The present study used the definitions of misinformation and rumor given in the study of Shin et al. (2018). People can share misinformation not knowing whether the shared information is incorrect or correct, with no intention to cause harm (Nunan et al., 2018). For the purposes of the current study, misinformation is considered to be the sharing of information known to be inaccurate (Allcott et al., 2019; Nunan et al., 2018; Shin et al., 2018).

Panic buying emerged as a core feature of the COVID-19 outbreak and is usually represented as the action of buying large quantities of a particular product or commodity due to sudden fears of a forthcoming shortage or price rise or loss of control among people due to fearful environment of COVID-19 (Islam et al., 2021). According to Naeem (2021), panic buying is a socially developed practice in which people make irrational buying decisions based on social proof.

During the COVID-19 outbreak, social media increased the spread of online rumors; as a result, more people are uncertain and anxious, and people make purchasing decisions based on misinformation. Typically, social media provides quantified, immediate feedback on approval level in a social network (e.g., likes on Facebook). A reader's attention may be focused on other factors, like concerns of social reinforcement and validation (Allcott et al., 2019; Nunan et al., 2018; Kidd, 2011). It has been found that people do not take accuracy into account even while consuming or sharing content relevant to the global pandemic (Naeem, 2021). In a nutshell, both misinformation and rumors can shift consumer behavior toward panic buying when consumers perceive that a forced lockdown can restrict their freedom and there is a lack of control on stock availability, especially when a government and other experts neither validate nor reject the viral information on social media platforms regarding unavailability of stock at retail stores.

Protection motivation theory (PMT) describes why and how people decide to undertake protective behaviors (Rogers, 1975; Maddux and Rogers, 1983). PMT proposes that social, physical, and psychological threats can influence behavior (Rogers, 1975). PMT

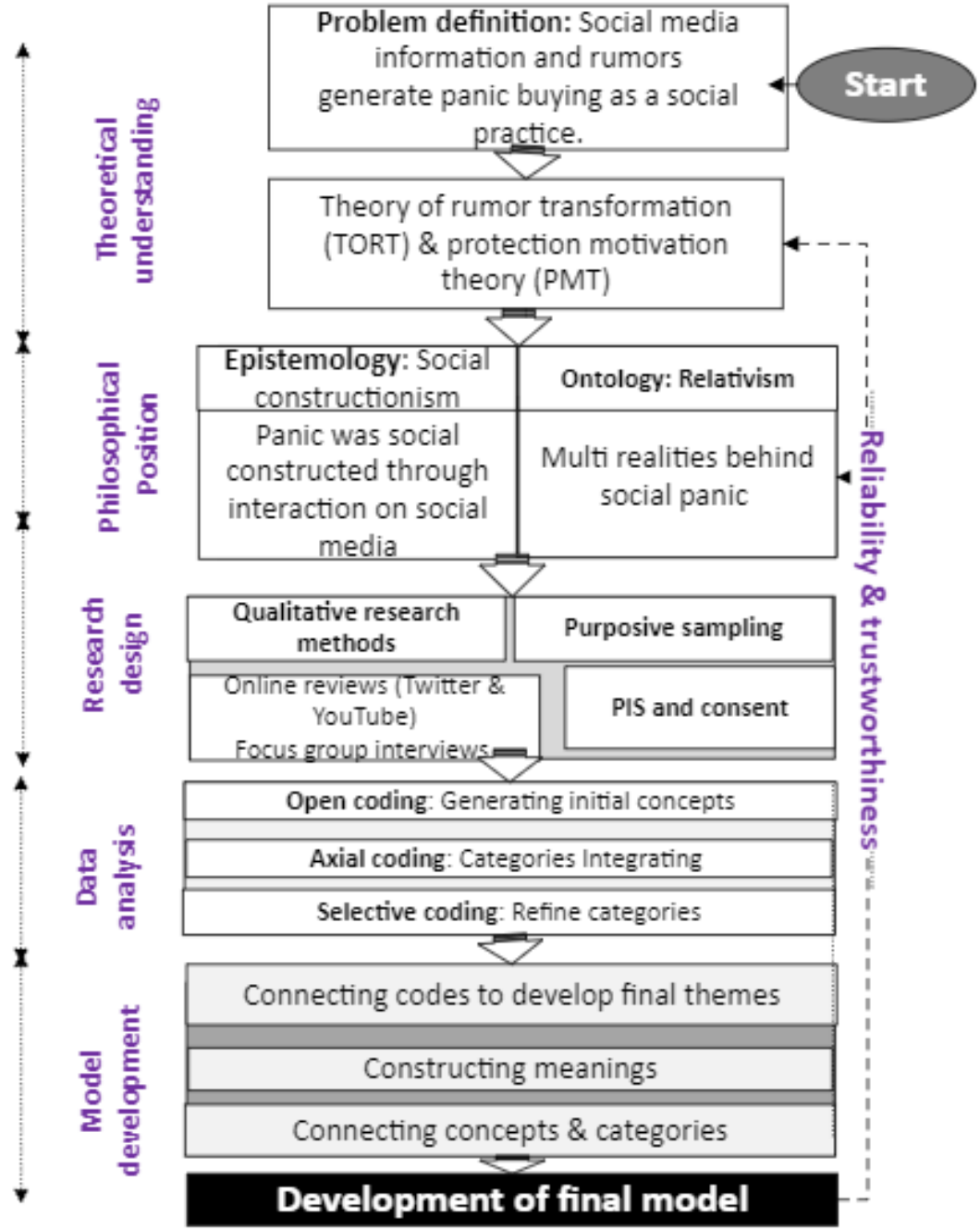
helps to clarify the use of fear appeals (Beitelspacher et al., 2012); an example of a fear appeal is an appeal made by a government that urges people to stay at home and announces that fines will be imposed to ensure the forced implementation of lockdown. According to PMT, coping appraisals and threats appraisals motivate protective behavior (Good and Hyman, 2020); therefore, people started to think that if they have to stay at home for a long period then they have to stockpile groceries for their families. Both coping and threat appraisals determine people's behavioral intentions toward adopting protection (Good and Hyman, 2020), such as buying as security to avoid worst situation during COVID-19 outbreak. In a nutshell, PMT can provide in-depth understanding of what the fears, threats, and dangers are for customers and what actions they take to cope with these fears, threats, and dangers during COVID-19 outbreak. Both TORT and PMT provide understanding of how misinformation and rumors through social media increased the social, physical, and psychological threats during the COVID-19 outbreak and what actions could be taken by customers to avoid these threats.

Methodology

From a relativist perspective, the same reality is experienced differently by different people depending on their social class and ethnicity (Boghossian, 2006). This study has undertaken a relativist ontological position to better understand how people draw different meanings from rumors and content shared online about COVID-19. Moreover, understanding social classes and meanings of language is also parallel to social constructionism, in the sense that social constructionists believe in the social construction of knowledge and the existence of various social realities (Griffith and Griffith, 2018). Therefore, this study has taken a social constructionist epistemological position to gain a better understanding of information sharing as an important social practice in order to address the question of how different people ascribed different meanings to the COVID-19 epidemic. According to social constructionism, knowledge originates from human relations (Boghossian, 2006). This study seeks to understand how social meanings developed from misinformation and rumors led to panic buying during COVID-19 pandemic. Understanding relationships over social media from a social influence

perspective would facilitate the development of knowledge about the world within a social framework of uncertainty, which arose from coronavirus; in particular, why socially communicated misinformation and rumors changed rational behavior into panic buying. The whole research process utilized in the current study is summarized in Figure 1.

Figure 1: research process



Data collection techniques

Data collection using multiple methods and sources can increase the validity, reliability, and generalizability of a study (Azemi et al., 2019; Patten et al., 2020). Although a survey is the most common method for the collection of quantitative data, it cannot provide in-depth rich interpretations and descriptions (Howell, 2012). In this regard, Howell (2012) stated that "context of the research can be lost when using surveys; one is left with narrow explanation rather than in-depth understanding" (p. 194). According to Naeem (2021), data collection from multiple methods and sources can offer rich insights about how the routine use of social media developed into panic buying practices. According to Flick (2004), the triangulation of qualitative data collection methods can offer thick interpretation and can help to develop a research framework that is aligned with one of the major objectives of the study. According to Flick (2018), the use of triangulation of qualitative methods can provide multiple causes and perspectives of the same phenomena; therefore, richer and unique results can be produced.

Flick (2018) suggested that triangulation can ensure the consistency of findings and these findings can become transferable to other contexts; therefore, the researchers selected both online and traditional data collection methods with the aim to achieve a thick interpretation of the phenomenon and to enhance the validity, reliability, and generalizability of the study. This study focused on three data collection methods: a) online reviews (comments posted by the public from across the world on YouTube videos related to panic buying), b) tweets (collected from UK government officials/media on their Twitter pages), and c) focus groups (interviews were conducted with groups of UK-based social media users). Initially, this study collected data through YouTube videos and Twitter where there was clear evidence of people sharing misinformation and online rumors that increased panic buying behavior. Afterward, researchers used the information gathered from online reviews and tweets to construct interview questions to get a thick interpretation of the phenomenon. The purpose of the data collection was to construct a holistic framework for conceptualizing how social, physical, and psychological threats can

change rational behavior into panic buying behavior. The time duration for data collection was seven months.

The major objective of using different sources for data collection was to understand the generation of shared information by officials. For example, Twitter was used by officials to share information with the public; so, Twitter is a source of official shared information and users' comments on this shared information. Additionally, there are major YouTube channels that have millions of subscribers who comment and follow shared content because it helps to increase knowledge, information, and understanding about specific objects and events. There were some viral YouTube videos on different channels on the subject of panic buying that were viewed, shared, liked/disliked, and commented on by huge numbers of people during the COVID-19 pandemic. Initially, this study selected the top trending videos on YouTube regarding panic buying of groceries to understand the role of public viral videos in providing information, misinformation, or rumors and what the response to this was. Therefore, Twitter data revealed the information shared by officials, whereas YouTube data revealed the viral videos generated by the public, which led to the social construction of panic through social interpretation of official information which was shared on Twitter.

The first stage of data collection was based on online reviews. According to Naeem (2021), people are increasingly sharing their experiences online through various social networking technologies. Moreover, online reviews play a very important role in capturing people's expectations, perceptions, needs, and requirements (Thakur, 2018; Naeem, 2021). However, the collection of data from online reviews involves many challenges that should be overcome, so that rich understanding from data collection as well as quality analysis can be achieved (Liu and Park, 2015). Since online reviews involve large amounts of data, an online tool is required for data filtration. Although NVivo software supports the managing and storing of data, it cannot support data filtration and cleaning in accordance with requirements (Liu and Park, 2015). The current study used data filtration and a well-developed management model with the help of Heedzy software to extract, clean, and track data most related to social media rumors and panic buying.

YouTube has information about everything, and it encourages people to create their own channels where they have followers and earn money based on original content, ad displays, and number of views. There are main YouTube channels that have millions of subscribers who comment and follow the shared content because they help to increase knowledge, information, and understanding about specific objects and events. There are some viral YouTube videos on different channels on the subject of panic buying, which are viewed, shared, liked/disliked, and commented on by huge numbers of people during the COVID-19 pandemic. Initially, this study selected the top trend videos on YouTube regarding panic buying of groceries. The inclusion criteria of the selection of YouTube videos was based on the maximum number of subscribers, views, likes, dislikes, and reviews on the selected channels related to panic buying during COVID-19 pandemic (see Appendix 3). Heedzy software was used to locate reviews related to rumors, misinformation, and panic buying. The purpose of the YouTube selection was to gain understanding of the misinformation and rumors, and the development of panic buying behavior. The data collected from YouTube channels also helped the researchers to develop specific interview questions with the purpose to construct a holistic framework for conceptualizing how social, physical, and psychological threats can change rational behavior into panic buying behavior in the UK.

Second, this study targeted tweets from March 15, 2020 (when UK government officials/media started to tweet about COVID-19) to November 2, 2020 (when second wave of COVID-19 started and lockdown was announced again). This study collected tweets from the Twitter accounts of @BorisJohnson (Prime Minister of the UK), @UK_HealthCare, @NHSuk, and @BBCBreaking. A total of 5385 tweets were posted from March 15, 2020 to November 2, 2020 on these accounts, but this study only considered those tweets that were related to rumors, misinformation, and panic buying.

A previous study of Theocharis et al. (2015) used the DiscoverText tool as it can capture a large number of relevant tweets. Therefore, this study used the social media crawler and text analytic tool DiscoverText to extract the relevant tweets. These tweets were

stored in the DiscoverText database, which supports the export of tweets from the database to a Microsoft Excel document, which is very useful for further data analysis.

The researchers used simple random sampling as it gives equal chances to all tweets and drew a random sample of tweets for data analysis. According to Theocharis et al. (2015), the use of simple random sampling to capture random tweets can make the results more error free and acceptable. The researchers did not include tweets that described similar thoughts regarding the context of panic buying. Therefore, only tweets that were unique and gave information about rumors, misinformation, and panic buying were selected. The selection of tweets was supported by knowledge gained from the review of the literature.

The third stage of data collection was based on focus groups. Purposive sampling was used because it enabled the selection of participants who would understand the objectives of the research as well as have rich information regarding the proposed objectives (Howell, 2012). The study of Howell (2012) highlighted that the use of purposive sampling is very common in qualitative studies as it allows the researcher to gather data from those respondents who can offer a thick interpretation; therefore, the present study used purposive sampling for focus group discussions. According to Panagiotopoulos et al. (2016) and Naeem (2020), NVivo supports thematic analysis of data from online reviews and focus group interviews, such as the production of codes, keywords, and themes for further description and understanding; therefore, the present study used NVivo for thematic analysis.

Howell (2012) emphasized the usage of interviews as they can “enable description, interrogation, evaluation and consideration of personal accounts (biographical and historical data) as well as provide opportunities for storytelling” (p. 198). By using focus group interviews, this study can provide a rich understanding through participatory observations (Patten et al., 2020). In this regard, Howell (2012) stated that “focus groups can deal with the dominant position of the interviewer and provide a mechanism for dealing with interviewer bias in terms of values and beliefs driving the interview” (pp. 200-

201). Researchers proposed that the selection of a small sample size can provide an opportunity to develop frank relationships and an environment where researchers can gather rich data using semi-structured interviews (Aslam et al., 2018; Muqadas et al., 2017). The selection of a small group of people enables the interviewer to conduct and control the focus group discussion with ease (Howell, 2012).

The Skype video conversation method was used for conducting focus group interviews with five groups of five people, 25 people in total (see Appendix 1 for focus group participants). The researchers applied particular inclusion criteria while selecting these 25 participants: their age should be 18 years or above; they should actively use their accounts on social media; they were ready to voluntarily provide the data; and they regularly use their accounts on social media for either information generation, information consumption, or information sharing purposes. The group discussions lasted from 40 minutes to 1 hour, which followed the expert recommendation to complete each group discussion within an average of 1 hour (Howell, 2012).

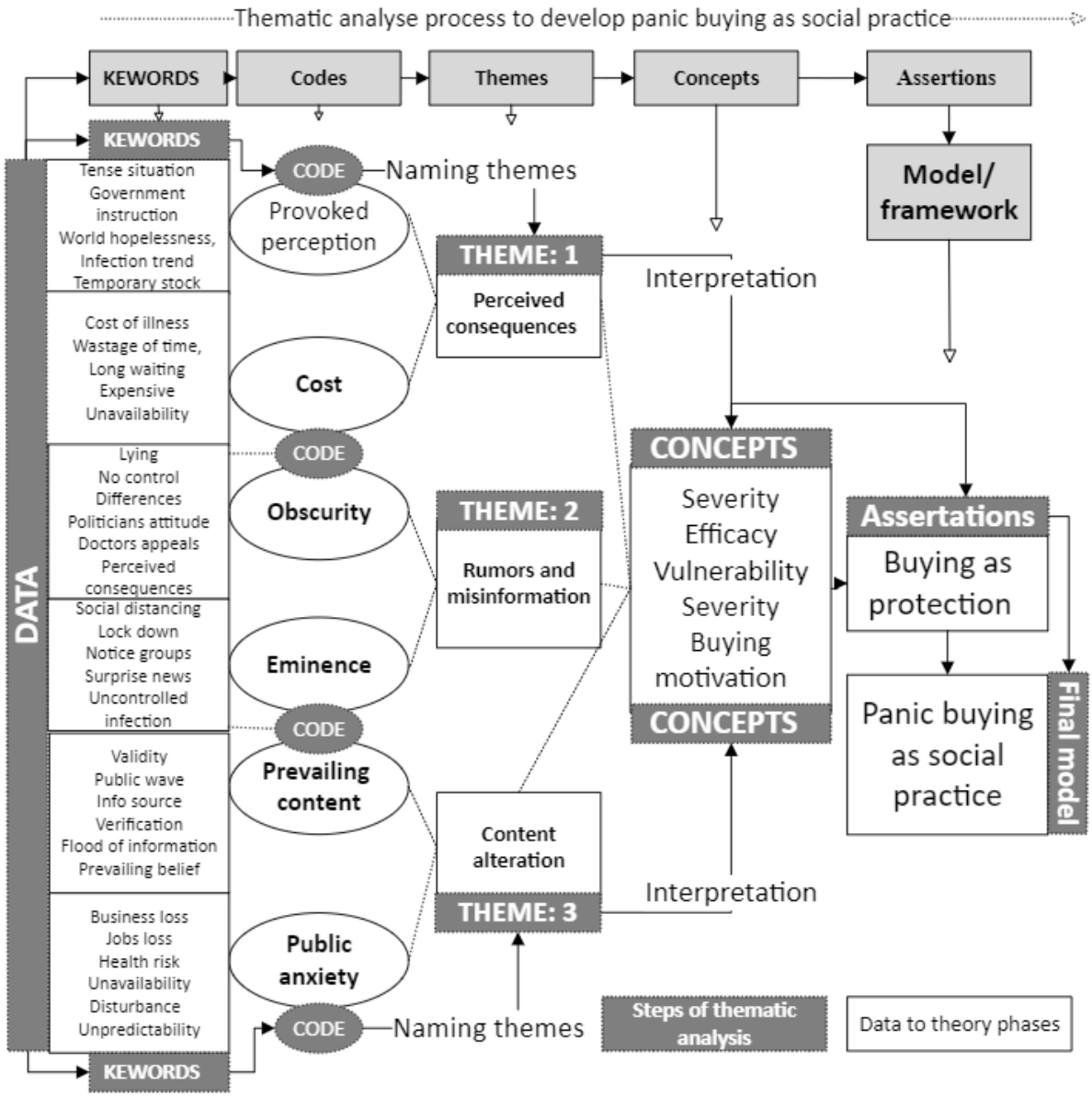
The development of the focus group interview questions took into account the expectations and experiences shared in online reviews. The researchers could easily reword questions because they had rich experimental knowledge about social media use and shared common cultural values with the selected participants (see Appendix 2 for focus group interview questions). The interviews were recorded in video and audio format. The researchers keenly observed the participants' tone of voice, gestures, and selection of words.

Thematic analysis

It is suggested that thematic analysis is the most suitable data analysis method when researchers are required to synthesize online reviews, tweets, and focus group interviews. Additionally, this study followed well-recognized studies in which social constructionism was used (Azemi et al., 2019, 2020; Naeem, 2020). The research data were organized into verbatim transcripts (183 pages) and then analyzed in three phases. In the first phase, the researchers analyzed the responses of UK people to social media

rumors, misinformation, and panic buying. The researchers iteratively visited those words that were frequently used in interviews in order to group those words into codes. Afterward, themes were assigned to the codes in accordance with the meanings they exposed. In the second phase, the researchers further analyzed the words under the light of differences in responses to panic buying. In the third phase, the researchers integrated the people's and UK officials' experiences into a holistic review of panic buying as protection framework. The codes and generated themes were integrative of data acquired through online reviews, tweets, and focus group interviews, as well as researchers' observations (See figure 2).

Figure 2: thematic analysis process



Findings and analysis

Main theme 1: Perceived consequences

Perceived consequences (i.e., perception about outcomes) can positively/negatively influence people's behavior toward choosing specific products (Vida et al., 2012). Therefore, people are more likely to make rational choices that can enhance perceived benefits as compared to perceived risks (Vida et al., 2012). However, a high level of insecurities and uncertainties about groceries can change rational decision making into

irrational decision making as people believed that they had lost control over things due to COVID-19 pandemic. As a result, they believed that buying extra could protect them from negative consequences, such as loss of control and exposure to risk, high price, and product unavailability. The main theme is explained with the help of two codes: provoke perception and cost (See figure 2). Please note that the word "participant" is used for the participants of focus groups and the word "respondent" is used for the Twitter analysis. The deliberate use of two different words is to avoid ambiguity for the reader.

Code: Provoke perception

Keywords: situation, tension, government, developing countries, infection, temporary stock

Provoke perception refers to the shared information that can help people to understand and interpret something (Hubert et al., 2013; Liebermann and Stashevsky, 2002) during an uncertain situation. The COVID-19 outbreak brought many negative consequences, such as loss of control over healthy lifestyle, job loss, and financial hardship, and it changed customers' rational buying behavior into panic behavior. For example, Participant 1 in focus group interviews shared, *"the situation is not under control even by our government, so there is more tension for food insecurities."* Although the UK government and retailers communicated through different social media channels that things are under control and they have enough stock, empty shelves, long queues in front of grocery stores, people's reviews, misinformation, and rumor spread through social media raised panic as many people believed that demand for groceries exceeded supply and UK government cannot control the situation, especially when supply is disrupted all over the world. For example, Participant 3 shared in a focus group interview, *"I am a single mom and spent three hours with my kid in a queue, I am really stressed due to long waiting hours and shortage of supplies, so I bought extra and recommended to my friends who have little kids too.*"

People believed that stock was only temporarily available, and retailers could not do much, especially as they import groceries from other countries where spread of COVID-19 is high, such as China and the USA. For example, C1 on YouTube stated, *"the*

availability of stock is not under control by supermarket because everything comes from other countries and demand is more compared to what temporary stock is available." Some people admitted hoarding with the justification they were protecting their families from uncertainty. For example, C23 on YouTube highlighted, *"not hoard but just be prepared For YOUR Family's sake huh? What about other people's families."* Information was shared by UK officials where they admitted that the situation is out of control as UK people have become selfish and conservative; therefore, they are anxiously buying. For example, Respondent 1 on Twitter stated, *"the people panic buying are selfish, short-sighted, stupid arseholes. It brings a tear to my eye to see so many people wholeheartedly taking on conservative values."* Some people advised others to buy extra things as there were rumors that people were doing stockpiling with the purpose to sell goods at higher prices. For example, C1 on YouTube shared, *"although masks have become mandatory, there is a shortage and high prices; so, buy other things before they become rare like masks. We heard rumors about people storing masks for selling at higher prices."*

Code: Cost

Keywords: risks, benefits, cost of illness, wastage of time, long lines, expensive

Cost refers to analysis of risks and benefits during certain and uncertain situations. Although existing literature described cost as price of goods/services and value of good/services (Papista et al., 2018; Puri, 1996), the meaning of cost can differ for different people, such as cost of illness, high cost of buying in future, and wastage of time in long queues outside stores. For example, Participant 7 in a focus group interview shared, *"I do not want to buy groceries at the cost of illness."* Similarly, Participant 12 in a focus group interview shared, *"It's good to buy on time otherwise we have to stand in long queues."* Some participants had no intention of repeatedly shopping for groceries as it could increase the threat to their lives. They said that the cost of illness is high because hospitals have limited resources and many private clinics faced a rush of patients. For example, C21 on YouTube stated, *"when we stand in queue/rush, do you think we will not be infected?".*

People shared that they have family and they do not want to put their family at risk of infection by frequently visiting retail stores; therefore, they bought extra for staying at

home, but supermarkets requested shoppers not to create a supply shortage for others. For example, C23 on YouTube stated, *"buying groceries means welcoming infection in our family."* It was also found that supermarkets in the UK requested through different platforms that people avoiding panic buying as it hurts other people. For example, Respondent 6 on Twitter highlighted, *"supermarkets ask shoppers to be 'considerate' and stop panic buying."* There were also some rumors that people were not hoarding because they needed to, but spent extra with the intention of selling these items at higher prices to get benefit from an uncertain situation. For example, C27 on YouTube stated, *"these people are hoarding not because they actually need it insomuch as they can resell it at three to four times the price to those who desperately need it."* The COVID-19 outbreak also created challenges for the supply of groceries, especially those from developing countries; as a result, people who read social media news regarding the increasing prices of groceries started buying extra during COVID-19 pandemic. Participant 4 shared in a focus group interview, *"I am from a low-income family and I have read the news on BBC that the cost of groceries will be increased two to three hundred GBP within one year, so I bought extra for our family."*

Main theme 2: Misinformation and rumors

The advent and rise of social media have increased information load, uncertainty, restiveness, and low authenticity of content, therefore, many people take decisions even though they cannot determine which information is trustworthy and which information is not credible (Naeem, 2020; Panggabean, 2020). Social media rumors are unverified information that circulate from one person to another regarding a specific object or event, which can enhance content ambiguity and public involvement, especially during a high level of uncertainty, such as during this pandemic. Whereas, misinformation refers to false information circulated because of an intentional mistake, cognitive bias, or carelessness, which can enhance wrong interpretations and irrational buying decisions among people. The theme of misinformation and rumors is explained with the help of the code's obscurity and eminence.

Code: Obscurity

Keywords: Lying, no control, hiding information, differences, politicians, doctors, false information, scam

Obscurity refers to information that is collected from various sources is not fully valid as a result people interpreted the shared content differently, which increased misinformation and rumors during the COVID-19 outbreak. Some people wrongly interpreted communications shared by UK Department of Health and Social Care. For example, Participant 20 in a focus group interview stated, *"when death rate was rising we received messages, such as stay home as much as possible, work from home if you can, limit contact with other people, and keep 2 meters apart from others; as a result, many of us bought extra to stay at home."* Some people in the UK thought that the actions of the elected government were inadequate and that they lied when they stated the situation was under control. For example, C1 on YouTube stated, *"what can you do when you know that politicians are lying about their strategies to control the situation that occurred during this pandemic?"* Some people said to buy now as the government cannot send groceries to your home if they are not available. People suggested that the government had started to hide information related to COVID-19 as people were not acting rationally about buying and were enhancing trouble for others. For example, C23 on YouTube highlighted, *"this is why the government withholds info from the public now. Clearly no one can handle it, the public freaks out about everything. As if that's gonna help the situation."* Some people shared that there were rumors about people who did not follow quarantine after COVID-19 infection; therefore, some people advised to not go shopping and to buy extra via online shopping. For example, C28 on YouTube shared, *"our friends forwarded some messages where people shared that people who got COVID-19 are not following rules and they are in stores so be careful when you're visiting or, better, place extra order online."*

The UK government continually asked people to be responsible and care about others when they buy, for example, Respondent 6 on Twitter highlighted, *"be responsible when you shop – there's more than enough food to go around, UK government says"*; however, people believed that the situation was worsening and did not believe what the UK government was saying. There was ambiguity and rumors because the government was telling people do not panic and you can get what you need from supermarkets, but doctors were saying

do not go out as you would be exposing yourself to risk of illness; in addition, pictures of empty shelves in retail stores went viral on social media and people gave negative reviews. The above are examples of some of the things that enhanced rumors, misinformation, and people's intention to buy extra. For example, Participant 25 in a focus group interview shared, *"you have to decide yourself for extra buying, especially when you see the difference between politicians' and doctors' shared information".* Some people shared that there are a lot of rumors and misinformation because no one knows every consequence of this pandemic, so there is a need to prepare for the worst situation. For example, Participant 13 in a focus group interviews shared, *"nobody knows what the consequences will be, so it's better to buy and stay home."* Although UK authorities continually shared messages to not share personal and banking information with anyone, many people were scammed by others' telling false information. For example, Participant 18 in a focus group interview shared, *"UK officials said through Twitter that we will not be asked to provide any passwords, bank account details or pin numbers, but many of our close ones were looted by those telling lies."* These scams also created further anxiety and distrust among people toward the government and they showed urgency for buying.

Code: Eminence

Keywords: social distancing, lockdown, notice groups, surprise, sources, infection

Eminence refers to well-known and respected sources that can enhance information exchange and decision making during a global pandemic. Social distancing and lockdown have increased the time people spend on social media as people continued their social communication using these channels. The spread of information and awareness increased as many people actively monitored these channels to take appropriate decisions during this pandemic. It was found that people interpreted shared communications from respected sources from their personal viewpoint. For example, Participant 3 stated, *"we saw on Twitter where UK prime minister and other officials said shop infrequently, so we bought necessities for a few months."* Respondent 6 on Twitter stated, *"government says people can shop for essentials, but as infrequently as possible."* Some people described the importance of trustworthy friends who provided timely awareness and

knowledge, especially during uncertainties; as a result, they were more prepared to take timely actions which could save them from the panic of limited groceries at stores. For example, Participant 6 said in a focus group interview, *"many of my close ones and trustworthy friends shared messages and pictures of no necessities at stores in other countries, thank God, we bought timely before this started in our country."*

Some people believed that the media played unfairly with the emotions of common people as it published what was better for rich people. For example, C27 on YouTube stated, *"spreading fear is what the media does best... because the ruling class which owns the media is only concerned about keeping their wealth and controlling the world's population."* Other people stated that when they read information shared through UK health officials, they realized that because they were new immigrants with limited resources, they did not have enough social contacts to ask for help in buying necessities if they got infected with COVID-19; therefore, they bought extra for the future. For example, Participant 25 in a focus group interview stated, *"when infection and death rate were rising, we received message like, 'If you are a shielded/vulnerable patient, self-isolating or have COVID-19 symptoms, arrange collection of medicine by a relative, friend, or ask your pharmacy about delivery.' But we are new immigrants, having limited budget, and not enough social network, so we bought extra due to uncertainty."*

People shared they found news on media regarding a stay-at-home order that was going to be implemented in Canada, but the Canadian government did not mention the duration of the order. As a result, people became more worried and acted irrationally. For example, C21 on YouTube stated, *"I am surprised that Canadian government is planning to declare mandatory to stay at home and also aiming to close the clothing, crockery, cosmetics, saloon and other sections; so, I did extra buying as they did not announce how long stay-at-home order can be continued".*

Main theme 3: Content characteristics

Content characteristics refers to the relevance, clarity, accuracy, credibility, and verifiability (from different sources) of generated, altered, and shared content on social media (Carlson et al., 2018; Kumar et al., 2016). These characteristics can either enhance or decrease the attractiveness of the messages and engagement with the messages

(Carlson et al., 2018; Kumar et al., 2016). For example, many people shared pictures of empty shelves and long queues of people in front of grocery stores, but they did not mention the country, location, or time of the pictures or who captured these pictures. This shared content increased anxiety and panic buying among people. This theme of content characteristics is described with the help of two codes: prevailing content, and anxiety and attractiveness.

Code: Prevailing content

Keywords: validity, actions, irrational, panic, source, verify, reject, flood of information, majority.

Prevailing content has very important characteristics that are directly attached to the sender's reputation and can directly influence a message's acceptance rate. Social media has increased the flood of information as many people regenerate and share communication created by others, using audios, videos, posts, comments, and reviews. Furthermore, sometimes the originators are either unknown or intentionally not shared or altered by others for their personal interests. The importance of sender credibility increases when people are afraid, stressed, and uncertain; sometimes, people who are less educated or unable to confirm the validity of a source, act irrationally and may hurt others. For example, C27 on YouTube stated, *"some of our friends forwarded a message to us that ships on a port are not operational, and people rushed to stores. They shared some pictures of long queues in front of stores, that's why we also bought extra."* It was misinformation as these ships were non-operational due to technical reasons, but people stockpiled necessities.

Some participants stated that many people shared stories without telling the source of the information; the stories warned them not to visit stores or touch groceries frequently as many people were infected when they did this. This shared information was not verified or rejected by the government and doctors; as a result, people believed this and started buying extra so that they did not have to go stores frequently. For example, Participant 13 in a focus group interview highlighted, *"many people shared a post that groceries are the source of spreading infection and I have to believe that because the government and doctors did*

not reject this information." Some argued that the spread of information and people acting on this information was so fast that they were unable to decide what was better and what was not; therefore, they usually imitated others. For example, Participant 25 in a focus group interview shared, *"you know we are in a flood of information, so, in this panic, we do not know what is true and who are liars, so we go with majority."*

Code: anxiety and attractiveness

Keywords: business, jobs, losses, quarrel, unavailability, fear

Shared communication in the form of videos, posts, likes, tweets, and reviews can create anxiety and stress for others, especially when people are panicking because many have lost their jobs and businesses, and social activities and support are reduced during this pandemic. Some participants shared that they had already faced losses in their businesses and were living with anxiety, so they were not ready for other trouble, such as shortage of food to feed to their families; as a result, they started buying extra to prepare for a worse situation. For example, Participant 23 shared in a focus group interview, *"you know my business is damaged and I am in extreme trouble, so when I saw everyone buying and sharing how hard it is to buy, then I went and bought extra."* Furthermore, C6 on YouTube shared, *"when we saw UK prime minister message on Twitter for again closing many things, then we ran to buy extra as we experienced difficulties in the past when we faced the first lockdown and could not buy timely."* Respondent 1 on Twitter said, *"pubs, restaurants, gyms and non-essential shops will be closed in UK from 1 November to 2 December 2020."*

Others said that viral content shared and viewed on social media added fuel to the fire as it increased anxiety and stress among people who had no intention to buy extra, but they did to avoid stress from unavailability of necessities at retail stores. For example, C10 on YouTube shared, *"when I saw viral videos of quarrels over groceries, then it increased my anxiety and stress as I did not want to stock and create tension for others."* Although retailers and government communicated that they had enough stock and alternatives to fulfil the public's needs, people had different concerns, such as, if they visited a store frequently then they would increase their chances of being in contact with those who have this infection. As a result, people's fear of illness and death led them to buy extra because

they wanted to stay in their homes during that uncertain time. For example, Participant 20 shared in a focus group interview, *"I felt people's suggestions were good for me, as they said do not go buying again and again with weak immune system as chances of death increase, it is more like what we saw in U.S (high death rate) through pictures and videos."* Some thought that opposition politicians were playing unfairly against the government; therefore, people are more anxious and making irrational moves, such as panic buying. Respondent 6 on Twitter said, *"UK government say opposition playing unfairly as they are giving statements which are increasing stress and distrust against the government among people."*

Discussion

The global COVID-19 pandemic has drastically changed the daily routines of people in many countries all over the globe (Naeem, 2020; Laato et al., 2020). As a precaution, many countries and regions have complete lockdown so that the spread of coronavirus can be prevented (Abdel-Basset et al., 2020; Yoo and Managi, 2020), for example, China (in Wuhan), USA, Canada, India, Germany, UK, and Poland. During periods of lockdown, people are allowed to go outside their homes only if strictly necessary, such as for exercise, essential work, to purchase supplies or groceries, or for medical care (Abdel-Basset et al., 2020; Yoo and Managi, 2020). Many people started stockpiling and panic buying products like pasta, bread, protective gloves, water, canned food, toilet paper, and hand sanitizer. During lockdown, people's information exchange and engagement increased via networking technologies (Chen et al., 2020; Liu et al., 2020; Verma and Gustafsson, 2020), but there is little understanding of how these networking technologies created misinformation and rumors which, ultimately, enhanced anxiety, stress, and panic buying among people. The current study aims at exploring and understanding the detrimental impacts of misinformation and rumors on people's buying habits. The study explored how people across the world, including UK government officials' Twitter accounts, shared their experiences of social media rumors, misinformation, and panic buying during COVID-19 pandemic through YouTube.

Extant literature revealed that peers have strong social influence on others' purchasing behavior during periods of fear and uncertainty (Larson and Shin, 2018), but there is

limited understanding of what the common factors are that can negatively influence people's rational purchasing decisions. Although the literature revealed that during the COVID-19 pandemic there has been a surge in the spread of hoaxes, rumors, and misinformation through social media platforms (Arsua, 2020; Wiener-Bronner, 2020), it did not offer understanding of how these social media rumors increased phycological, social, and physical threats that increased irrational buying behavior. For example, the interpretation of shared information regarding infrequent buying, stay-at-home order, and the closing of many restaurants and some groceries sections have increased stress and fear; therefore, people bought extra. Further, when people saw the pictures of empty shelves, long queues, and full groceries carts, then they also became involved in panic buying due to fear of shortage of supplies and high cost in the future.

The most common response during times of uncertainty and fear is panic buying, which can be viewed either as irrational behavior, such as stockpiling non-essential items (i.e. toilet paper). Furthermore, these essential products (meat, rice, pasta, etc.) whose supply is limited and comes from the developing world. Although supply chains at a global level were operating normally, stockpiling and panic buying resulted in shortages of numerous products on the shelves of supermarkets. As a result, many people, including those from middleclass families, who chose not to buy irrationally faced challenges in purchasing goods during the global pandemic. Viewing other people engaging in stockpiling and panic buying made the situation worse and people started to imitate each other, especially when they saw videos of empty shelves and long lines of people outside supermarkets. Some people suggested that it is better to buy extra through placing orders online as there were many rumors that some people who were infected with COVID-19 were not following quarantine and were visiting supermarkets. Other people shared rumors that people were stockpiling products to sell them at higher prices, so it was better to buy now.

Although previous studies highlighted that the credibility of information that is shared via social media platforms can be ambiguous (Pal et al., 2019, 2020), governments, politicians, health officials, and other people could not reject misinformation and rumors shared on social media platforms in a timely manner. Resultantly, people faced panic

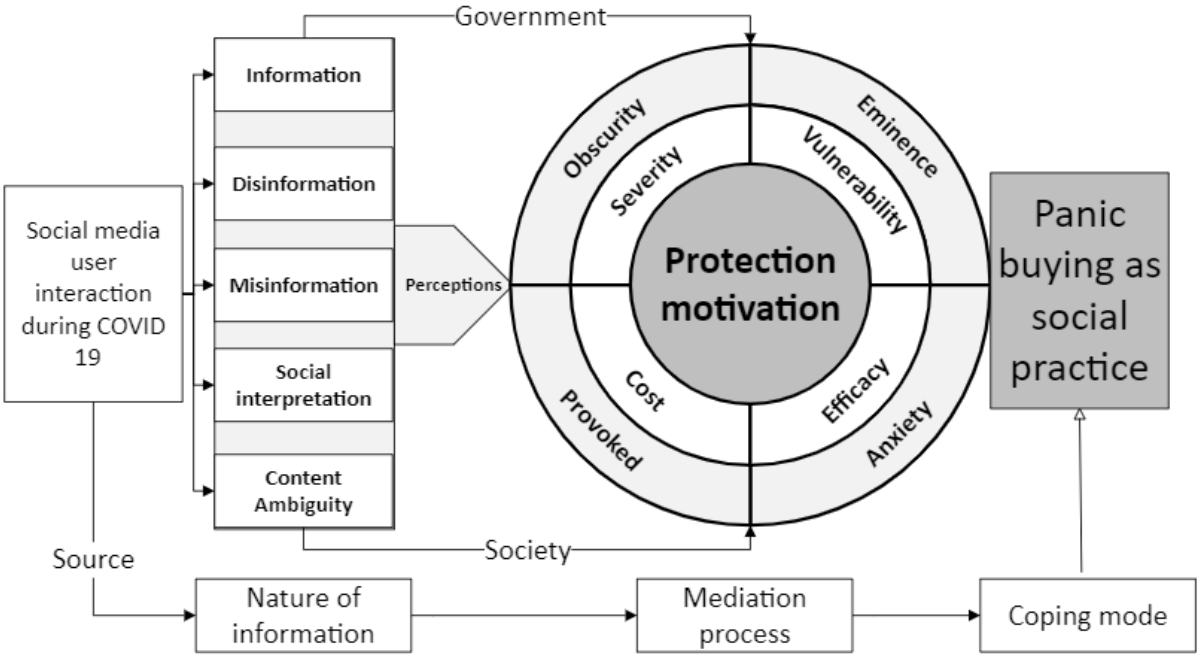
buying across many developed countries. For example, media exaggeration created stress; in addition, some of the most active misinformation and rumors which were shared and changed the rational buying patterns of people were that the: virus spread through fresh groceries; government and politicians hid information; a high number of supermarket employees were infected with COVID-19; customers got COVID-19 from visiting retail stores; people did not complete their quarantine; closure of ports; and supply disruption at global level. People argued that they could not trust the information shared by government, politicians, and health professionals as they earlier urged people to stay at home and do not panic buy for essentials as everything is available, whereas there was evidence in the form of pictures, videos, and audios on social media in which people expressed their concerns regarding shelves empty of essential and non-essential items. People interpreted communications in line with their personal interests, for example, if government and health officials communicated that people should buy infrequently, then people thought they should buy more so that they could stay at home. They believed that buying groceries later in the course of the pandemic would increase their chances of getting infected as they would have to stand in long lines outside supermarkets.

Although previous studies confirmed the buying extra behavior of people during COVID-19 outbreak (Naeem, 2020, 2021), they did not provide the causes what type of content led the people to adopt this protective behavior for their personal interests. People actively shared viral videos and pictures from around the world, which created the social practices of extra buying as people believed that it was important to buy extra so they did not face a worse situation in the future. The empty shelves, long lines in front of grocery stores, people's negative reviews, and suggestions for their social network through social media generated socially validated content which was liked and shared by many people; as a result, people started to imitate each other, which developed into the practice of panic buying. Many people shared that the death statistics and empty shelves of retail stores were not under the control of the government; therefore, they could not take the chance of exposure to illness by visiting stores, especially when people were quarrelling, snatching, and filling their shopping carts.

The findings revealed that the cost of illness is high, especially when hospitals have limited resources and many private clinics faced a rush of patients; therefore, people bought extra to stay at home. Some people shared they had already lost their jobs or businesses and they faced financial hardship which increased their anxiety. They stated that when they saw evidence of a shortage of necessities in other countries, then they started buying extra. Many people shared that they had no intention to buy extra, but when they saw the panic buying behavior of others, then they also decided to buy extra, as COVID-19 had a negative impact on businesses and individuals. The physical threat, such as standing in long queues and increased chances of getting infected, the social threat, such as videos and pictures of full shopping carts and quarrels among people in supermarkets, and the psychological threat, such as the hiding of information and the socially generated interpretation of communication, increased uncertainty, anxiety, and stress among people; therefore, they bought extra at local and global level.

Contribution

Figure 3: Panic buying as social practice framework here>



Previous studies have explored the role of social media with respect to fake news and policy making (Rampersad and Althiyabi, 2020; Pennycook et al., 2020), digital health strategies (Fagherazzi et al., 2020), enjoyment and socialization (Apuke and Omar, 2020), self-disclosure (Nabity-Grover et al., 2020), changes in food consumption behavior (Laguna et al., 2020), and misinformation sharing (Islam et al., 2020) during COVID-19 pandemic. Although there is literature on social media and panic buying (Islam et al., 2021; Naeem, 2021; He and Harris, 2020), there is little understanding of how socially shared misinformation and rumors can enhance people's motivation to protect personal interests and enhance social practices of panic buying. The study of Islam et al. (2020) highlighted the role of social media and the spreading the misinformation during COVID-19 pandemic, but their theoretical framework is limited to cognitive load and affordance perspectives during COVID-19 pandemic. Therefore, the present study extends understanding and offers rich insights on how socially shared rumors and misinformation regarding spreading the virus, supply disruption of ports, infection rates in supermarkets, shortage of necessities, public interpretation of governments' and health officials'

communications, empty shelves and long queues outside retail stores increased communication, viral content, and social validation on social media. The shared misinformation and rumors changed consumers' rationality and social practices and they started buying extra with the intention to avoid anxiety, stress, and a worse situation.

PMT theory has been used in health communication (Kowalski and Black, 2021), and in understanding customer revisiting intention to tourism destinations during COVID-19 pandemic (Rather, 2021), while TORT has been used to gain understanding about rumor dissemination in online communities (Wang et al., 2018). However, this is the first study which combines TORT and PMT with the purpose to understand how social misinformation and rumors shared over social media created global uncertainty and anxiety, which changed consumers' rational buying decisions into panic buying for groceries and medical products. Theoretically, this study adds two dimensions (obscurity and eminence) to TORT. The first dimension (obscurity) showed that the public's interpretations of governments' and health officials' communications generated rumor that ultimately enhanced social panic buying behavior. For example, some people stated that the government is lying when it states everything is under control, they suggested "buy today" because the government cannot send groceries to your home if groceries are not available. The second dimension added to TORT is eminence: the communications of well-known sources were used to increase social panic buying behavior with the help of social media platforms. For example, people quoted the message of the UK prime minister on Twitter in which he said, shop infrequently, and they bought extra necessities, which created a shortage of supplies and social panic buying practices. The Panic buying as social practice framework provided understanding of the fact that the COVID-19 pandemic generated physical isolation and a fearful environment in which people used social media to capture relevant information and take timely decisions. However, the socially shared rumors increased the obscurity and eminence (see Figure 3).

The TORT helped to explain how misinformation and rumors about the virus-built people's protection motivation; therefore, they panic bought during the global pandemic. The TORT provides understanding of how the news of spreading of the virus, ports supply

disruption, and infection rates in supermarkets built public opinion regarding they should buy extra with the purpose to stay at home for an uncertain time period. The TORT highlighted those social rumors can create desire among people, such as people read stories about customers who were infected by the virus through visiting stores, therefore, people either started online ordering or buying extra so that they could avoid visiting supermarkets. The TORT indicates that rumors and misinformation can infect the mind, for example, some people from lower income families heard that the cost of groceries will be significantly increased at the end of 2021, so they started panic buying.

PMT is a classical theory that explains people's responses to social, physical, and psychological threats (Abdullah, 2020; Abdelhafiz and Alorabi, 2020; Rogers, 1975). The literature highlighted the social, psychological, and physical impacts of COVID-19 in the context of health communication (Abdullah, 2020; Abdelhafiz and Alorabi, 2020). Although PMT gives understanding about COVID-19 threat, it does not provide an understanding that the threat is a socially constructed phenomenon. For example, this study provides understanding that the threat of threat is generated through social interactions using social media platforms. These social media interactions built the psychological pressure to take panic buying decisions. For example, when people socially shared news that there were empty shelves in superstores, then other people who did not intend to buy bought extra due to the fear of shortage of groceries.

There is understanding available regarding how social media increases social interaction, increases customer engagement, and increases intention to use social media for information purposes (Cabiddu et al., 2014; Osei-Frimpong et al., 2020), but this study contributed to the literature by offering understanding of how social interactions on social media increased socially shared misinformation and rumors which ultimately increased the social threat. For example, some people shared that they bought extra groceries because they read health officials' communication regarding stay at home to protect your life and others'. The physical threat was visiting stores, which increased the chance of infection. Therefore, people preferred to buy extra so that they could stay at home and reduce the risk of infecting their families. The psychological threat was that many people

had lost their jobs and businesses, which increased their anxiety and stress, but when they saw evidence of empty shelves and long lines of people queueing for necessities, then they preferred to spend their savings on food so that they could be saved from a worse situation. Another example of psychological threat is that many people who faced challenges in buying during the first lockdown in the UK, now wanted to buy extra to avoid stress in the second lockdown of the UK.

The study has practical implications for institutions, people, and supermarkets. Communication during a global crisis can create threats of threats, such as the COVID-19 threat created the threat of panic buying of groceries. These threats of threats further enhanced the vulnerability of disabled and ill people. The social interpretation of rumors and misinformation created threat especially for those who are in a low-income group and for vulnerable people; as a result, people became depressed and took irrational buying decisions. The government and health institutions gave conflicting statements regarding the situation being under control, which further enhanced social interactions and threats of threats.

The conflicting statements showed a lack of coordination and integration of communication between government and non-governmental institutions during a global crisis, which led to institutional ambiguity and created panic among the public. The first practical suggestion of this study is that there must be institutional coordination and collaboration to create integrated communication to avoid conflicting statements. Enigmatic statements are open to more than one social interpretation over social media, which can sabotage the major objective of institutional communication. Institutions use of collaborative, integrated, and lucid communication strategies using different media channels can help to communicate an integrated message that can reduce inconclusive communication and help to avoid rumors and misinformation that arise through social interpretations, which further lead to socially consented action like panic buying.

Institutions should use their legitimate power to deal with misinformation and rumor rather than just focus on communicating the required information; therefore, government

security organizations should work in collaboration to take action against sensational rumors and misinformation to help reduce uncertainty and panic among the public. The government should have a preapproved course of action to deal with rumors and misinformation, for example, they could disengage people and top trends on social media that increase global uncertainty and psychological pressure. In addition to providing information to the public, government officials should also monitor and evaluate trends on social media and respond to them; in this way, government can tackle viral rumors on social media.

In the context of the public, this research provides empirical evidence of socially constructed panic buying that arose from the publics' social interpretation of the social standards of reasoning and social procedures of justification of panic buying. So, this research emphasizes the social responsibility of people when they share, create, respond, and consume social information over social media because some people do not authenticate the source of news, especially when it is disseminated through public institutions, and some social media users and some fake profiles trigger social media rumors and misinformation for their personal interests, or they believe in the social interpretation of other users. Therefore, government institutions should tackle rumors and misinformation through raising the importance of sharing information on social media and they should educate the public about how to judge the purpose behind the information before taking a decision based on information shared on social media.

Celebrities and influencers should also take the lead by taking social responsibility for reducing public panic during a crisis and to increase the public's social awareness of their responsibility for information shared on social media. Finally, people should take social responsibility for communicating reliable and trustworthy information on social media, which could facilitate institutions' handling of uncertain situations and reduce the likelihood of generating a crisis, for example, a grocery shortage became another crisis during the pandemic.

In the context of supermarkets, it was found that supermarkets can play a proactive role on social media to maintain and create public confidence in the supply chain and availability of products. For example, local stores can share information on social media about the availability of stock and give confidence to people that they do not need to panic buy as they have enough stock available to meet demand. Through their supply chain and logistics, supermarkets can make products available in a short period of time; however, the slow reaction of supermarkets to ration products exposed them to shortages. Supermarkets should make their supply chain more resilient. Effective supply chain management should have preplanned actions to transfer products to their outlets in a timely way, especially during a crisis situation, which could reduce the probability of shortages of stock and panic buying.

Future research

Although qualitative studies can provide in-depth understanding, they are not free from limitations; however, they can offer opportunities to researchers for future studies. Future studies could use mixed methods (both quantitative and qualitative), which would increase the internal and external validity of study as well as provide more insights on the topic. For example, the given research framework in the contribution section can be further tested to analyze its validity using various statistical methods. This study offers several propositions which can be further tested, such as increasing misinformation and rumors can create protection motivation behavior.

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Appendix 1: group Interview participants

No.	Age	Gender	Social media accounts	Instant messaging Apps	Profession	Education
P1	18–30	M	2	3	Business owner	GCSE
P2		F	4	3	Govt employee	Master's degree
P3		F	3	3	Student	DBA in progress
P4		M	2	2	Housewife	GCSE
P5		F	3	3	Unemployed	ACCA
P6		F	4	4	Mom	Bachelor's degree
P7		M	3	3	Homemaker	GCSE
P8		M	4	3	Accountant	CFA
P9	31–45	M	3	4	Bank manager	MBA
P10		M	2	4	Marketer	Master's degree
P11		F	3	4	Freelancer	Bachelor's degree
P12		F	3	4	Student	Master's degree

P13		F	4	4	Student	DBA in progress
P14		M	5	3	Student	PhD in progress
P15		M	4	2	Unemployed	GCSE
P16		M	2	2	Unemployed	Bachelor's degree
P17		F	3	3	Mom	GCSE
P18	45–60	M	2	2	Professional consultant	Master's degree
P19		F	3	3	Bank manager	Master's degree
P20		M	3	2	Business owner	Bachelor's degree
P21		M	4	3	Unemployed	GCSE
P22		M	3	2	Unemployed	GCSE
P23		M	4	3	Marketer	Master's degree
P24		F	4	3	Office worker	Bachelor's degree
P25		M	3	2	IT manager	Master's degree

Appendix 2: Group interview questions

Q1: Do you think that your use of social media platforms increased during COVID-19?

Q2: What type of information did you commonly read/respond to during this pandemic? What information did you commonly see about buying on social media, which created anxiety/stress among people?

Q3: Do you think that social media influenced your spending practices and routines during this pandemic?

Q4: Have you seen any video, picture, or post which created panic among people to buy immediately?

Q5: Do you think your purchases of groceries and other items increased as compared to before the start of this pandemic? If yes/no, then why?

Q6: What is your opinion about government and other stakeholders' efforts to control the flow of information that influences consumers' buying intentions?

Q7: Can you share any rumor/misinformation on social media which negatively influenced the purchase of groceries?

Q8: Do you think media and government have played a responsible role in controlling rumors and misinformation during the global pandemic?

Appendix 3: Selected YouTube channels (N=28)

Particulars	Subscribers (Million)	Views (Million)	Likes (Million)	Dislikes (Million)	Reviews (Million)
C1	5.4	2.9	1.2	.05	.09
C2	3.6	2.5	.98	.09	.06
C3	4.1	2.1	.78	.08	.08
C4	2.9	1.9	.23	.03	.04
C5	2.7	1.7	.88	.02	.03
C6	3.5	1.3	.56	.01	.05
C7	4.4	1.4	.21	.09	.06
C8	3.1	0.8	.11	.04	.03
C9	2.8	0.9	.34	.04	.02
C10	3.4	1.7	.76	.02	.04
C11	3.3	1.9	.16	.01	.04
C12	2.1	1.6	.08	.01	.06
C13	2.9	1.9	.22	.03	.03
C14	3.8	0.9	.12	.05	.02
C15	3.7	1.7	.17	.04	.03
C16	3.7	1.5	.19	.02	.05
C17	2.6	1.1	.23	.03	.02
C18	2.5	09	.33	.02	.06
C19	2.2	1.4	.37	.01	.06
C20	2.1	1.3	.17	.02	.05

C21	1.9	1.6	.13	.04	.03
C22	1.6	1.1	.11	.05	.04
C23	2.4	0.9	.31	.03	.05
C24	1.2	1.8	.04	.04	.02
C25	2.1	1.3	.05	.03	.07
C26	1.7	1.2	.03	.02	.06
C27	1.4	.99	.04	.01	.04
C28	1.1	.76	.01	.02	.05