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A Step-by-Step Process of Thematic Analysis to Develop a Conceptual Model in Qualitative Research

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Abstract

Thematic analysis is a highly popular technique among qualitative researchers for analyzing qualitative data, which usually comprises thick descriptive data. However, the application and use of thematic analysis has also involved complications due to confusion regarding the final outcome's presentation as a conceptual model. This paper develops a systematic thematic analysis process for creating a conceptual model from qualitative research findings. It explores the adaptability of the proposed process across various research methodologies, including constructivist methodologies, positivist methodologies, grounded theory, and interpretive phenomenology, and justifies their application. The paper distinguishes between inductive and deductive coding approaches and emphasizes the merits of each. It suggests that the derived systematic thematic analysis model is valuable across multiple disciplines, particularly in grounded theory, ethnographic approaches, and narrative approaches, while also being adaptable to more descriptive, positivist-based methodologies. By providing a methodological roadmap, this study enhances the rigor and replicability of thematic analysis and offers a comprehensive strategy for theoretical conceptualization in qualitative research. The contribution of this paper is a systematic six-step thematic analysis process that leads to the development of a conceptual model; each step is described in detail and examples are given.

Keywords

qualitative, inductive, deductive, thematic analysis, codes, themes, conceptual model

Introduction

The aim of this paper is to present a comprehensive systematic model for thematic analysis that culminates in the development of a conceptual model that encapsulates a researcher's findings. Furthermore, we provide practical guidance on each step of the thematic analysis process, discuss factors that enhance its application, and illustrate how to transform observed phenomena into potential codes and themes for deeper analysis. To ground our discussion in practical terms, we use a study conducted by Naeem and Ozuem (2022a) as an exemplar to provide concrete examples for each of the six steps

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Correction(October 2024): In this article, "inductive methods" has been changed to "deductive methods" in the sentence "Positivism, which favours deductive methods, builds its model on top of previously established theories and conducts its experiments in an unbiased manner" of section "Step 6: Development of Conceptual Model. The development of a conceptual model has its own importance. "Theorizing is also work: often researchers make the mistake of submitting their study for publication without making the effort to do the conceptual work necessary for the development of theory"".

of the proposed thematic analysis process. These steps include the selection of keywords and quotations, coding, theming, interpretation, and the development of a conceptual model. This paper argues for the merit of observing specific phenomena during data collection and refining them into potential codes and themes. The subsequent identification of keywords, codes, and themes helps to form preliminary assertions that can be further interpreted to develop the final conceptual model. Indeed, we posit that the thematic analysis process we have constructed exhibits considerable adaptability and potential for utilization in relation to grounded theory (GT), ethnographic approaches, and narrative approaches and, with some adaptation, more descriptive positivist-based methodologies would benefit.

Thematic analysis is a research method used to identify and interpret patterns or themes in a data set; it often leads to new insights and understanding (Boyatzis, 1998; Elliott, 2018; Thomas, 2006). However, it is critical that researchers avoid letting their own preconceptions interfere with the identification of key themes (Morse & Mitcham, 2002; Patton, 2015). According to Scriven (1991), a "goal-free" evaluation aligns well with inductive research where theories are developed from the data. Users of thematic analysis develop core skills for conducting other kinds of qualitative analysis (Braun & Clarke, 2006). Naeem and Ozuem (2022a) used thematic analysis to construct a conceptual model of their findings through a series of steps, including keyword and quotation selection, coding, theming, interpretation, and model development. This study provides a six-step theme analysis technique based on their methodology for researchers to employ in developing a conceptual model of their findings. This involves keeping an eye out for phenomena as data is being collected, brainstorming potential codes and themes, and making initial statements that will be refined into a final model. Naeem and Ozuem's (2022a) research is used to show the theme analysis process and the publication emphasizes the benefits of utilizing different methodologies at each level.

Exemplar Study: Overview and TA Process

During the COVID-19 pandemic, Naeem and Ozuem (2022a) investigated how social media misinformation and rumors contributed to the phenomenon of "panic buying." The researchers used a six-stage theme analysis technique to decipher the qualitative data they gathered from Twitter, YouTube, and interviews.

They began by reading over the data to get a feel for it, and then they narrowed it down by choosing appropriate keywords and citations. As a result, we have codes and may organize them into categories based on their shared characteristics. They were able to decipher the connection between social media rumors and panic buying thanks to the recurring motifs and patterns they identified. They reasoned from their data to create statements and eventually arrived at the "Panic buying as social practice" model. Based on the Protection Motivation Theory (PMT) and the Theory of Rumor Transmission (TORT), this model analyzed the role that false information and rumors played in triggering a buying frenzy.

Naeem and Ozuem's (2022a) study, depicted in Figure 1, generated three main themes from the data. The first theme "Perceived consequences," derived from the codes "Provoke perception" and "Cost," addressed the perceived outcomes of panic buying. The second theme, "Misinformation and rumors," derived from the codes "Obscurity" and "Eminence," highlighted the role of unclear and prominent information sources in spreading misinformation. The third theme, "Content Characteristics," arose from the codes "Prevailing content" and "Anxiety," which reflected prevalent information types and the emotional factors influencing panic buying.

Thematic Analysis Process

The principles of the thematic analysis technique, such as coding of data, searching for themes, refining the themes, and reporting the findings, are relatable to other qualitative methods, such as discourse analysis (Flick, 2022). Thematic analysis is a method to analyze qualitative data. It involves the identification and reporting of patterns in a data set, which are then interpreted for their inherent meaning (Braun & Clarke, 2006; Liebenberg et al., 2020; Xu & Zammit, 2020); these patterns can be found on the basis of understanding the meaning of keywords used by participants. In this paper, we delve into the intricate details of a robust methodological approach known as systematic thematic analysis, where we systematically unpack its six steps: transcript creation and data familiarization; keyword identification; code selection; theme development; conceptualization through the interpretation of keywords, codes, and themes; and, finally, the development of a conceptual model (see Figure 2). These steps serve as a roadmap to meticulously process qualitative data; they enhance the rigor of the research process and the depth of research findings. The six steps of systematic thematic analysis are each described in detail in the next six subsections. The subsections provide a comprehensive breakdown of the methodologies of each step; they elucidate each step's functions within the overarching systematic thematic analysis process, and substantiate them with scholarly references and practical examples from the exemplar study.

The thematic analysis process described in this paper is termed "systematic" because it follows a structured, sequential approach to interpreting research data. Each stage builds on the previous one, which results in a comprehensive understanding of the data. This organized method enhances the consistency and replicability of the findings, and it enables clear connections between the data, interpretation, and final conclusions. This systematic structured approach ensures thoroughness and limits potential bias.

Step 1: Transcription, Familiarization With the Data, and Selection of Quotations

This is the initial phase of the thematic analysis process. It involves the transcription of data and familiarizing oneself with it. Researchers dive deep into the content to discern initial themes and important sections. They then select quotes that

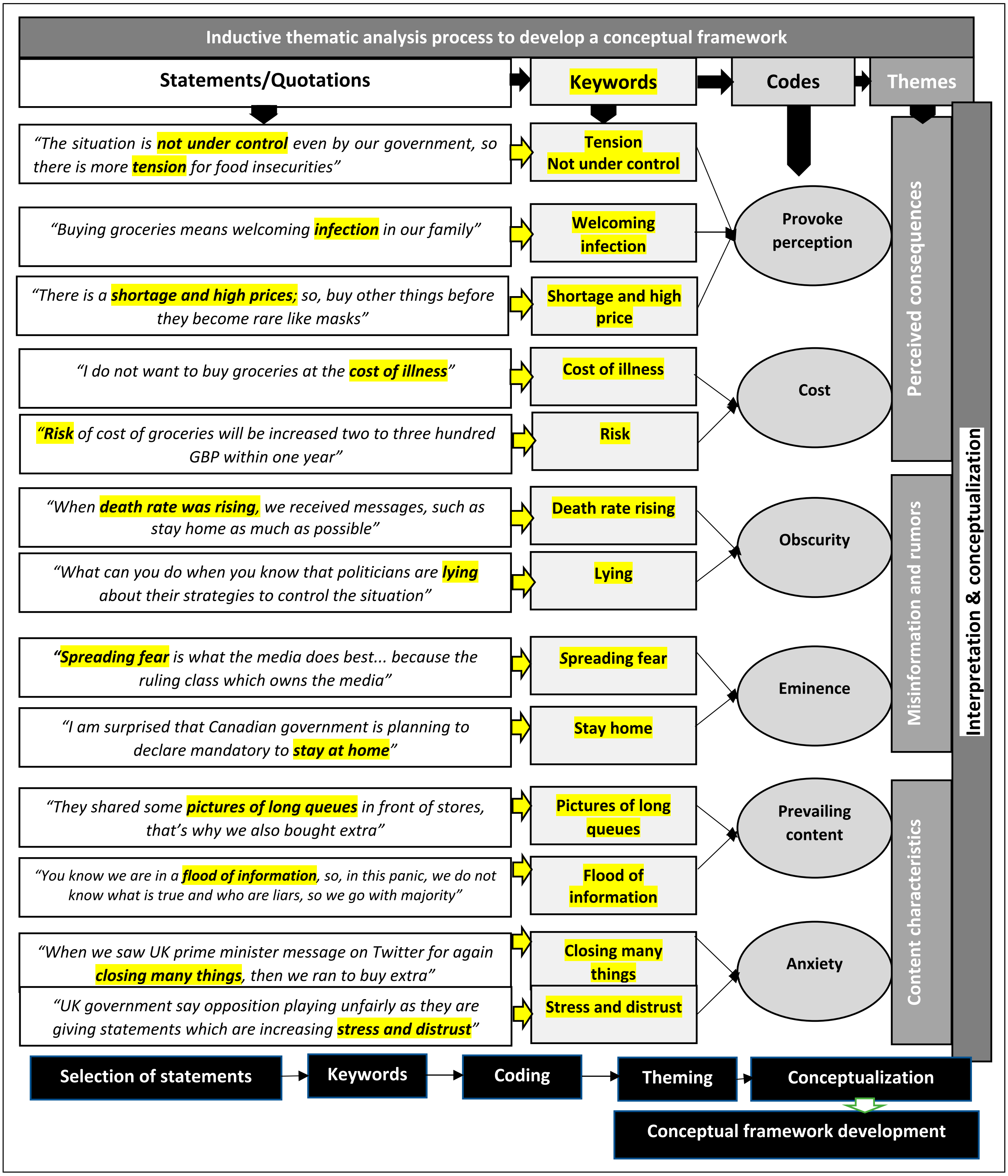
Inductive thematic analysis process to develop a conceptual framework
Statements/Quotations
Keywords
Codes
Themes
"The situation is not under control even by our government, so there is more tension for food insecurities"
Tension
Not under control
"Buying groceries means welcoming infection in our family"
Welcoming infection
"There is a shortage and high prices; so, buy other things before they become rare like masks"
Shortage and high price
Provoke perception
"I do not want to buy groceries at the cost of illness"
Cost of illness
"Risk of cost of groceries will be increased two to three hundred GBP within one year"
Risk
Cost
"When death rate was rising, we received messages, such as stay home as much as possible"
Death rate rising
"What can you do when you know that politicians are lying about their strategies to control the situation"
Lying
Obscurity
"Spreading fear is what the media does best... because the ruling class which owns the media"
Spreading fear
"I am surprised that Canadian government is planning to declare mandatory to stay at home"
Stay home
Eminence
"They shared some pictures of long queues in front of stores, that's why we also bought extra"
Pictures of long queues
"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"
Flood of information
Prevailing content
"When we saw UK prime minister message on Twitter for again closing many things, then we ran to buy extra"
Closing many things
"UK government say opposition playing unfairly as they are giving statements which are increasing stress and distrust"
Stress and distrust
Anxiety
Perceived consequences
Misinformation and rumors
Content characteristics
Interpretation & conceptualization
Selection of statements
Keywords
Coding
Theming
Conceptualization
Conceptual framework development

Figure 1. Thematic approach used in exemplar study (Naeem & Ozuem, 2022a).

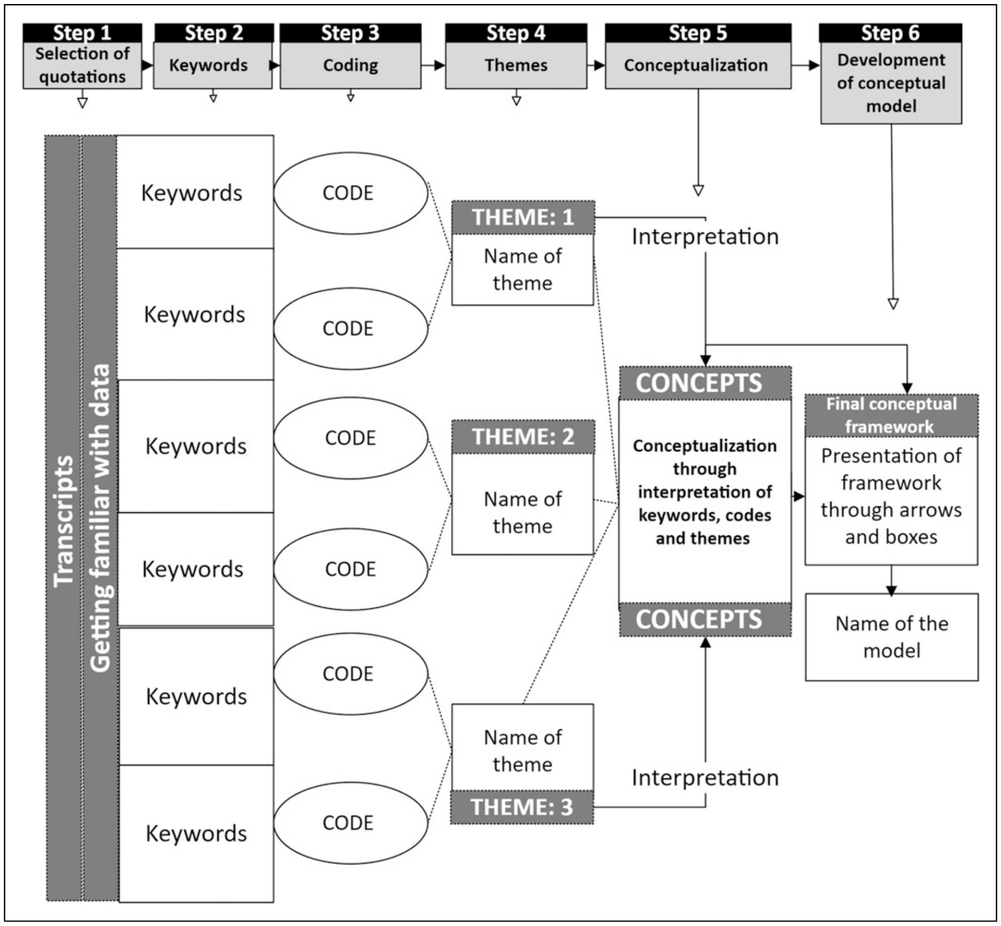
Step 1
Selection of quotations
Step 2
Keywords
Step 3
Coding
Step 4
Themes
Step 5
Conceptualization
Step 6
Development of conceptual model
Transcripts
Getting familiar with data
Keywords
Keywords
Keywords
Keywords
Keywords
Keywords
CODE
CODE
CODE
CODE
CODE
CODE
THEME: 1
Name of theme
THEME: 2
Name of theme
Name of theme
THEME: 3
Interpretation
Interpretation
CONCEPTS
Conceptualization through interpretation of keywords, codes and themes
CONCEPTS
Final conceptual framework
Presentation of framework through arrows and boxes
Name of the model

Figure 2. A systematic thematic analysis process: A novel six-step process for conceptual model development in qualitative research.

bring the data to life and aptly represent diverse viewpoints and patterns pertinent to the research objectives.

Step 2: Selection of Keywords

This phase involves close examination of the data, be it from interviews, focus groups, or visual content. Researchers identify recurring patterns, terms, or visual elements and designate them as keywords. These keywords encapsulate participants' experiences and perceptions and are directly derived from the data.

Step 3: Coding

In the third step, coding, short phrases or words, known as codes, are assigned to segments of data that capture the data's core message, significance, or theme. This step simplifies complex textual data by transforming it into a theoretical form and assists in identifying elements related to the research questions. Keywords play an essential role in coding as they form the backbone of the analysis and help to convert raw data into insightful, manageable units.

Step 4: Theme Development

Theme development involves organizing codes into meaningful groups to identify patterns and relationships, thereby offering insights into the research question. In this step, the researcher transitions from a detailed analysis of codes and categories to a more abstract interpretation by creating themes. These themes go beyond merely being recurring elements because they embody patterned meanings that link the research questions and data.

Step 5: Conceptualization Through Interpretation of Keywords, Codes, and Themes

This step, conceptualization, involves understanding and defining concepts emerging from the data. Researchers identify social patterns and refine them into definitions that align with their research. They utilize tools like diagrams or models to understand the relationships among these concepts. The quality of these definitions is assessed based on clarity, accuracy, reliability, applicability, and their contribution to theory and practice.

Step 6: Development of Conceptual Model

The final step in the thematic analysis is the development of a conceptual model. This process involves creating a unique representation of the data and it is often guided by existing theories. The model serves to answer the research questions and underscore the study's contribution to knowledge. This step signifies the culmination of the analysis; it encapsulates all the findings and insights derived from the data.

Step 1: Transcription, Familiarization With the Data, and Selection of Quotations. According to the six steps of the thematic analysis approach of Braun and Clarke (2006), familiarizing yourself with the data is the first step. To properly document an interview, a high-quality audio recording and, preferably, a word-for-word transcription are required; the researcher could also manually highlight patterns in the data (Tuckett, 2005) with the intention to find the most relevant statements. Ochs (1979, p. 44) said that "*A more useful transcript is a more selective one*" (i.e., a selective transcript is more useful because it contains only the most relevant and significant information). "*The evaluation objectives provide a focus or domain of relevance for conducting the analysis, not a set of expectations about specific findings*" (Thomas, 2006, p. 239). In other words, the process of selecting certain parts of an interview and leaving out others is important because it makes the transcript more concise and easier to analyze (Brady, 2015; Lamba et al., 2022). The data immersion stage in thematic analysis is not only about documenting everything, but also involves identifying significant information relevant to the research objectives. As stated by Thomas (2006), these objectives provide a focused domain for the analysis; they guide the extraction of crucial data from transcripts rather than dictate specific findings. Thus, effective transcription is not about including every detail, but selecting parts relevant to the evaluation objectives, which facilitates a focused and manageable analysis.

In the initial stage of transcription, it is of paramount importance to judiciously select and highlight pertinent quotations; this process not only conserves time but also leverages the fresh reminiscences of the conversation still dwelling in the researcher's mind. Quotations, when employed astutely, have the potential to animate the data; they provide a vivid portrayal of the subject matter. Ethical considerations underscore the necessity to use quotations that respect the participants' confidentiality, and their application must be reliable. Researchers need to foreground pertinent quotations that resonate with the interview context, bring the narrative alive, and respect ethical standards. This selection should echo robust patterns in the data, reflect diverse participants' viewpoints, and balance readability and authenticity (Eldh et al., 2020; Lingard, 2019).

Researchers are encouraged to reiterate their engagement with the transcripts because it enhances their ability to identify suitable quotations. Quotations can enhance the readers' engagement with the text and underscore unique aspects of the data. It is essential, however, to refrain from choosing quotations that merely incite controversy; instead, researchers should focus on those that genuinely illustrate the findings (Eldh et al., 2020). Quotation selection should symbolize robust patterns within the data and incorporate a diverse range of participants' voices, thus ensuring an inclusive representation (Lingard, 2019). Moreover, Creswell (2012) classified quotations into three types that each serve a distinct function in research: discrete, embedded, and longer quotations. Discrete quotations are concise and contribute diverse perspectives, embedded quotations contain brief quoted phrases that can signify a shift in the text, while longer quotations, though less prevalent due to word count constraints, aid in illustrating complex understandings.

Researchers ought to provide an adequate context to enable readers to accurately comprehend the essence of a quote. This may sometimes necessitate incorporating the researcher's question along with the participant's response (Lingard, 2019). Quotations are often utilized to exemplify findings, with the primary aim of invigorating the text—breathing life into it. Adopting quotations to illuminate results stems from the epistemological assumptions of an interpretative methodology (Eldh et al., 2020).

Transparent representation of diverse participants' quotations augments the credibility of findings and contributes to the trustworthiness of the research (Côté & Turgeon, 2005). There is an urgent need, however, to reconsider the application of quotations by addressing the "if," "why," "how," and "when" of their use. Indeed, quotations may serve various purposes, including evidence, explanation, illustration, impression (Lingard, 2019), representation (Eldh et al., 2020), and readability enhancement. The strategic deployment of quotations should be conscious and transparent, which contributes to a meaningful and comprehensive analysis. Researchers are encouraged to practice reflexivity by continually examining their beliefs, values, and assumptions throughout the research process (Jackson & Mazzei, 2012). This can be achieved by maintaining a reflective journal or by memoing, thereby ensuring their interpretations are not overly influenced by pre-existing philosophical or theoretical stances.

Understanding the philosophical and conceptual assumptions underlying different approaches to thematic analysis can assist researchers in choosing an appropriate method for their research and ensure the trustworthiness and validity of their findings (Lin, 1998). Reading a transcript repeatedly can help researchers select appropriate statements from the data (Grundy et al., 2003; Tracy, 2019), but this suggestion is too subjective. Braun and Clarke (2019) noted that "*the philosophical underpinnings of thematic analysis are crucial and that different philosophical and theoretical approaches to knowledge construction can lead to different procedures for conducting thematic analysis*" (p. 81). For example, from the constructivist perspective, which focuses on subjective interpretation of a participant's meaning and how it is constructed (Tavares et al., 2021), approaches such as GT or reflexive thematic analysis might be employed (Timmermans & Tavory, 2012). This perspective would also entail social constructivism. On the other hand, critical realism, which concentrates on objective reality and how it is socially constructed (Tavares et al., 2021), might utilize a different mode of thematic analysis. Critical realists seek causal explanations of reality and employ approaches like critical thematic analysis (Timmermans & Tavory, 2012).

Studies such as those conducted by Wiltshire and Ronkainen (2021) and Fryer (2022) provide insights into how critical realism is applied in thematic analysis and demonstrate its unique contribution in making sense of qualitative data through experiential, inferential, and dispositional themes. Understanding the philosophical and theoretical foundations of thematic analysis guides researchers to choose appropriate quotations. This choice, reflective of their philosophical and theoretical orientations, enhances the trustworthiness and validity of their findings. This also highlights the significance of a researcher's philosophical and theoretical orientations in the initial stage of thematic analysis, especially in choosing pertinent quotations. Braun and Clarke's (2019) observations underscore this by showing how different philosophical and theoretical beliefs about knowledge formation may dictate unique thematic analysis procedures. Hence, quotation selection is not simply a mechanical task but is influenced by the researcher's philosophical and theoretical approach (Jackson & Mazzei, 2012). For instance, a constructivist researcher, focusing on participants' subjective meaning-making, may select quotations that vividly depict these subjective realities. Conversely, a critical realist researcher, concentrating on the social construction of objective reality, may prefer quotations echoing societal impacts on individual experiences or highlighting objective elements of investigated reality.

In their study, Naeem and Ozuem (2022a) adopted a social constructionist perspective and they employed PMT and TORT as the theoretical foundation for their data analysis. The first phase of their analysis involved close reading of the transcripts to familiarize themselves with the data; this stage was guided by these theories to explore psychological and behavioral factors affecting panic buying during the COVID-19 pandemic. Their social constructionist approach aided their deciphering of the transcripts and provided a theoretical scaffold for understanding panic buying as a socially constructed phenomenon; this was achieved through understanding the socially constructed meaning of COVID-19 that emerged from social interactions and communications. This perspective emphasizes the role of language and discourse in shaping our understanding and actions.

PMT facilitated understanding of how individuals perceive threats and respond to protect themselves and shed light on the perceived threats related to COVID-19, such as infection fears or the anxiety of running out of essential supplies. But TORT helped us figure out how COVID-19 rumors and false information influenced people's core convictions and attitudes, such the idea that stockpiling food and water would keep us safe in a crisis. Insightful knowledge of the complex interplay of psychological and behavioral elements driving panic buying during the epidemic might be gleaned from these theoretical foundations. By taking a sociological perspective, we were able to better understand the dynamics at play during a buying frenzy and to conceptualize it as a shared behavior rather than an individual reaction.

Step 2: Selection of Keywords. Thematic analysis is commonly used to analyze interview and focus group data, but it can also be applied to other forms of data such as photographs, videos, and other visual material (Braun & Clarke, 2019). When using thematic analysis with visual data, the process of identifying themes may involve identifying patterns or recurring visual elements such as colors, shapes, or symbols. In addition, the researcher may analyze the contextual information surrounding the visual data to gain a deeper understanding of the meaning behind the image. Thematic analysis aims to identify and report the most repeated patterns in the data (Braun & Clarke, 2006; Saldana, 2021; Wicks, 2017). To analyze interview or focus group data, as per current understanding of thematic analysis, quotations or statements are selected from the data and grouped together under a code (Saldana, 2021; Simula, 2018; Tracy, 2019). "*Within speech are meanings and perceptions that construct our reality*" (Oliver et al., 2005, p. 1274), which can be taken to mean that keywords (sets of words) have meaning or are meaningful for research.

Although quotations as evidence in qualitative research resurface periodically, we advocate a deeper examination of fundamental tenets that uphold scientific rigor, such as validity and reliability. Many scholars argue that credibility provides a better alignment with a qualitative worldview (Noble & Smith, 2015). Eldh et al. (2020) further asserted that quotation selection resonates with the epistemological stance of interpretivism and social constructionism, as these quotations are utilized in the interpretation of research findings. Naeem and Ozuem (2022a) added that a researcher can start data analysis while collecting the data and can note the keywords commonly used by participants; these commonly used keywords can be utilized to discuss the results of the research at the conceptualization stage of data analysis. So, we introduce a novel step in thematic analysis: the selection of keywords from the chosen quotation. The selection of powerful, meaningful, and pertinent words from quotations as keywords paves the way for subsequent code development and data interpretation, and amplifies the depth and quality of the analysis that will be discussed in the next subsections of this paper.

Community-based participatory research approaches prioritize collaboration with community members throughout the research process to ensure that the outcomes are representative of the community's needs and perspectives (Burgess et al., 2021; Kyoon-Achan et al., 2018). In this approach, researchers work collaboratively with community members to form a community of practice to develop research questions, collect and analyze data, and interpret the findings. In addition, researchers practise reflexivity, which entails constantly reflecting on their own assumptions and worldviews. Researchers can turn the data into new terminology that are more in line with the community's practises and lexicon by actively engaging with and collaborating with people of the community to discover and classify the key phrases or words. To successfully capture the diverse viewpoints and needs of a community, keywords can be used in the framework of community-based thematic analysis in qualitative research.

According to Naeem and Ozuem (2022a), this first step in qualitative research is the most crucial. In qualitative research, choosing the right phrase or term to stand in for a keyword is an important step that needs to be given lots of thought. In order to accurately convey the participants' perspectives and interpretations, researchers often employ a number of different methods to select the most acceptable phrases or terms. In qualitative research, keywords are essential for creating codes that accurately reflect the underlying meaning of the data. During data collection, researchers might take note of participants' most frequently used keywords, as suggested by Naeem and Ozuem (2022a). For an analysis to be methodical, rigorous, and grounded in the data, it needs keywords, which are terms or phrases that indicate essential concepts or ideas in the data. Using keywords to indicate the concepts and ideas existing in the data ensures that the created codes are true to the data. Many authors suggested that reading a transcript repeatedly can help researchers select appropriate statements from the data (Grundy et al., 2003; Tracy, 2019), but this suggestion is too subjective. In contrast, Naeem and Ozuem (2022a) selected statements/quotations on the basis of meaningful keywords in these statements, which is why the selection of keywords is the second step in thematic analysis. In this paper we propose that keywords can be selected on the basis of 6Rs: realness, richness, repetition, rationale, repartee, and regal. Examples of the 6Rs based on the exemplar study are as follows.

- Realness: The keywords selected by the researchers reflected the real experiences and perceptions of individuals during the COVID-19 pandemic. These keywords expressed real situations, tensions, and fears that people experienced during the pandemic, such as "Flood of information" and "Not under control" (see Figure 1). They represented the actual concerns and anxieties that people had about their health and wellbeing.
- Richness: The selected keywords were rich in meaning and helped to provide a detailed understanding of the phenomenon being studied. For example, the keyword "Welcoming infection" provided a rich understanding of the fear and concern that individuals had about becoming infected with COVID-19. The keyword "Cost of illness" encompassed the financial, physical, and emotional costs associated with panic buying and misinformation during the pandemic.
- Repetition: The repetition of particular words (these words could be the same words or different words that held the same meaning for the participants) throughout the data indicated their significance and relevance to the study, and they were selected as keywords. For instance, the keyword "Spreading fear" was repeatedly used in the data to emphasize the impact of misinformation on people's behavior during the pandemic.
- Rationale: The research's theoretical foundations informed the choice of keywords. TORT describes how rumours spread because to people's inability to cope with ambiguity and fear, while PMT examines how people evaluate and react to actual threats. The chosen ideas informed the selection of relevant keywords for investigating the role of social media in driving "panic buying" during the pandemic. There was a correlation between the terms "Risk" and "Cost of illness" and the perceived costs and benefits of panic buying, whereas the keywords "Tension" and "Welcoming infection" represented the perceived threat of the pandemic.
- Repartee: Words were chosen to symbolize the conversation's most poignant or "witty" moments, which provided further context for the study. For example, the keyword "Death rate rising" was a poignant indication of people's fear.
- Regal: Words that were crucial to understanding the phenomenon of panic buying and misinformation during the COVID-19 pandemic were selected as keywords. These keywords helped to establish the significance of the study and its contribution to the literature on this topic. For example, the keywords "Flood of information" and "Lying" on social media reflected a critical aspect of the pandemic and its impact on individuals' behavior.

We present a summary of the 6Rs for keyword selection in qualitative research in Table 1. Table 1 succinctly defines each R and offers insights into how keywords can be selected in the context of a research study.

Step 3: Coding. Creswell (2015) highlighted the need for coding: "*Text data are dense data, and it takes a long time to go through them and make sense of them*" (Creswell, 2015, p. 152). Coding represents assigning a short phrase or a word to data. It symbolizes the salient, summative, and essence-capturing attribute of the data (Saldana, 2016). Richards (2015) stated that coding is in fact indexing of the data. Put simply, coding is the process of cataloguing information (keywords) according to a predetermined structure that leads to making data take on a more theoretical and conceptual form. As stated by Attride-Stirling (2001), the process of coding involves breaking down real data into smaller, more manageable pieces that can then be categorized and analyzed for patterns and themes. Coding enables researchers to identify specific elements of the data that are relevant to their research question, which can then be used to develop a more comprehensive understanding of the underlying concepts and idea (Fereday & Muir-Cochrane, 2006).

In articulating a cohesive thematic analysis procedure, this manuscript aspires to function as a beneficial beacon for

Table 1. Definitions of the 6Rs for Keyword Selection in Thematic Analysis.

6Rs for Keyword Selection	Definitions
Realness	Words that reflect the genuine experiences and perceptions of the participants
Richness	Words that are rich in meaning and provide a detailed understanding of the phenomenon being studied
Repetition	Words that frequently occur in the data, which indicates their significance and relevance to the participants
Rationale	Words that are connected to the theoretical or philosophical foundation of the research
Repartee	In general, repartee refers to quick, witty conversation or a quick, witty reply. However, when used in the context of thematic analysis and in selecting keywords from the data, "repartee keywords" are words that are insightful, evocative, and stimulate further discussion or consideration
Regal	Words that are central to understanding the phenomenon under study and contribute significantly to the literature through adding new insight

researchers who wish to investigate their data in a methodologically rigorous yet adaptable fashion. Furthermore, in our description of systematic thematic analysis, we delve into the philosophical constituents within the context of both inductive and deductive approaches, which enriches thematic analysis. Inductive research, derived from researchers' observations, leads to theory development by building broader themes from participants' views (Braun & Clarke, 2006). As Braun and Clarke (2019) posited, understanding the theoretical and philosophical underpinnings of thematic analysis enables researchers to adopt an appropriate methodological approach, thereby assuring the validity and trustworthiness of the findings (Lin, 1998). The validity and trustworthiness of the findings of thematic analysis can be improved through careful consideration of the keywords selected at the second stage or the researcher can go back to the relevant quotation to select more keywords or to change the keywords relevant to the codes. The thoughtful selection and use of keywords are crucial to effective coding, as they help to transform raw data into more insightful, manageable units for further examination.

Keywords in coding are essential terms or phrases extracted from the data that are crucial to understanding the themes or patterns within it. They can be actual words used by participants in a study or words the researchers use to summarize or categorize the data. In the coding process, consideration of keywords helps in multiple ways:

1. Code development: Keywords often serve as the basis for the development of codes. They encapsulate the core idea or theme of a specific data segment; thus, they help the researcher create meaningful, concise codes.
2. Categorization: Keywords can be used to categorize similar pieces of data together. When a specific keyword appears repeatedly, it might indicate a significant theme or concept, which can be grouped for deeper analysis.
3. Pattern identification: Keywords help researchers identify patterns or trends within the data. These patterns can guide the formation of broader themes or insights.
4. Data comparison: By examining the presence or frequency of specific keywords, researchers can compare different segments of data, which can highlight contrasts, similarities, or relationships.
5. Enhanced understanding: Keywords can provide a "snapshot" of the data; they offer researchers a quick conceptual understanding of the underlying ideas or sentiments.

The analytical process balances between descriptive analysis, which outlines patterns or trends, and interpretive analysis, which offers subjective perspectives (Miles & Huberman, 1994, p. 56). This balance depends on the paradigm of inquiry, either post-positivist, emphasizing description, or constructivist, emphasizing interpretation. However, the thematic analysis approach could also fit a post-positivist paradigm (Howell, 2012, p. 30). This implies that thematic analysis, with its balance of descriptive and interpretive analysis, aligns well with the post-positivist paradigm, which focuses on objective descriptions of reality. Furthermore, Miles and Huberman (1994) stated that its flexibility allows for both inductive and deductive approaches, the latter of which resonates with the structured and theory-testing nature of post-positivist inquiry, thereby solidifying thematic analysis as a reliable, rigorous, and adaptable method in deductive research.

The coding phase in thematic analysis, where patterns are identified, bears resemblance to inductive data analysis. These identified codes must later be interpreted and assigned to themes (Braun & Clarke, 2006). In contrast, deductive thematic analysis, also referred to as "theoretical thematic analysis," is grounded in a pre-existing theory or framework, which guides the coding and theme development (Braun & Clarke, 2006). It involves the application of an existing theoretical or conceptual framework to structure and interpret the data. The deductive approach is hypothesis-driven and aims to test or confirm existing theories. (Saldaña, 2016). Deductive coding, linked with descriptive analysis, is a top-down approach where pre-existing theories, models, or codes guide the data analysis (Elo & Kyngäs, 2008). This approach fits within a post-positivist paradigm, aiming to describe a singular, objective reality. The researcher applies their theoretical framework to the data and creates themes based on established constructs (Crabtree, 1999). It parallels GT as both use coding to develop themes or categories from concepts that emerge during data collection. Thematic analysis identifies and describes patterns, whereas GT extends thematic analysis to generate substantive theory from empirical data. GT goes a step further by using this coding process to not only identify and describe patterns but also to generate substantive theory from the empirical data, thus adding a layer of theoretical development to the process (Charmaz, 2014). So, in the context of GT, the coding phase in thematic analysis involves identifying patterns within the data, similar to inductive data analysis, which then serves as a basis for interpreting and establishing themes.

Inductive coding refers to the process of gathering keywords with the purpose of creating an organized list of codes. Inductive coding involves generating codes from the data itself to allow patterns and themes to emerge from the real data. This approach is exploratory and data-driven; it allows the researcher to remain open to new ideas and themes that may emerge from the data (Fereday & Muir-Cochrane, 2006). Inductive coding, linked with interpretive analysis, is a bottom-up approach where codes emerge from the data and reflect the unique contexts and experiences of participants (Thomas, 2006). The researcher immerses themselves in the data and allows themes to emerge organically; this approach is often aligned with a constructivist paradigm that recognizes multiple realities and the co-construction of knowledge between researcher and participants (Braun & Clarke, 2006). Essentially, the transformation of paradigms concerning degrees of subjectivity and objectivity has underscored the flexibility intrinsic to research methodologies and highlighted that these tools of analysis are intimately intertwined with, and, indeed, emerge from the distinctive nature of specific disciplines and perspectives (Lincoln & Guba, 1985).

It is plausible to utilize either inductive or deductive coding independently within the context of thematic analysis (Naeem & Ozuem, 2022a). Braun and Clarke (2006) explained the role of coding in thematic analysis and its resemblance to inductive data analysis. In inductive (or data-driven) coding the codes are derived from the real data, whereas in deductive (or theory-driven) coding in thematic analysis the codes are derived from theory. Naeem and Ozuem's (2022a) study involved both deductive and deductive approach to thematic analysis where the coding and theme development were grounded in pre-existing theories (TORT and PMT). For instance, the codes "Provoke perception" and "Anxiety" align with PMT's central tenet of an individual's response to perceived threats, where a person's anxiety level can influence their motivation to adopt protective behaviors. "Cost" and "Eminence" connect with the TORT, where the perceived costs and benefits (Eminence can be seen as the perceived social status benefit) of a behaviour influence the individual's intention to perform that behaviour.

On the other hand, "Obscurity" and "Prevailing content" might represent novel insights gained from the data that were not initially anticipated within the framework of TORT and PMT. "Obscurity" could represent participants' experiences and perceptions of ambiguity or lack of clarity in their environment or situation. Similarly, "Prevailing content" might reflect the participants' perceptions of dominant or widespread narratives, beliefs, or attitudes within their social or cultural context. In the inductive approach, keywords play an essential role in forming new codes because they provide context-specific insights that help shape and define the code's meaning and represent the emergent patterns in the data. Conversely, in a deductive approach, keywords can bolster and substantiate existing theoretical codes, reinforcing their relevance and applicability to the analyzed data, by linking direct expressions or ideas back to the theoretical constructs they represent.

Keywords offer substantial starting points for coding; however, they may not be enough to fully capture the breadth and depth of qualitative data in thematic analysis. We propose six Rs—robust, reflective, resplendent, relevant, radical, and righteous—that serve as a comprehensive coding strategy that addresses the complexity of the data, the interplay between theories and facts, the context-specific richness, alignment with the research objective, the avoidance of overlaps, and a logical consistency within the broader coding agenda. The following elaborates on each "R," delineating their definitions, applications, and relevance through examples based on the exemplar study.

- Robust: Coding should convey the true essence of data in a theoretical manner (Nowell et al., 2017). The code "Provoke perception" is a perfect example of robustness as it encapsulates keywords like "Tension," thereby providing a substantial understanding of the data. Another code, "Cost," embodies various aspects of cost, such as "Risk" and "Cost of illness," demonstrating that a robust code is multifaceted and comprehensive in representing data.
- Reflective: Codes should symbolize a relationship between facts and theories to create a lens through which facts can be interpreted (Guba & Lincoln, 1994; Sandelowski, 1986; Savage, 2000). For example, the code "Prevailing content" mirrors critical thinking about information quality during the pandemic.
- Resplendent: Codes offer powerful, impressive, and comprehensive explanations of the context under study (Holton, 2011; Punch, 2013; Rogers, 2018). They articulate the implicit richness of data and paint vivid imagery of the context. The code "Eminence" demonstrates resplendence by showcasing urgency and apprehension during the pandemic.
- Relevant: Codes should symbolize inferential and descriptive data gathered during research; they should represent the data using the most suitable phrases

(Corbin & Strauss, 2015; Cunningham, 2004; Saldana, 2016; Sandelowski & Barroso, 2003). The code "Obscurity" is a pertinent example of relevance, as it focuses on the topic of misinformation during the pandemic. Consistent application and justified reasoning are key to creating relevant codes.

- Radical: Codes should avoid overlap and offer unique insights, even when contradicting the main narrative (Boyatzis, 1998; Braun & Clarke, 2006; Creswell, 2015; Sandelowski, 2010). The code "Provoke perception" presents a radical perspective by including unconventional keywords that challenge traditional assumptions about panic buying.
- Righteous: Codes should fit logically within the larger coding framework and align with the research's purpose (Attride-Stirling, 2001; Nowell et al., 2017; Richards, 2015). This ensures that codes are selected righteously, that is, with a clear understanding of the decisions made during coding. For instance, the codes "Prevailing content" and "Anxiety" precisely embody the assigned keywords and demonstrate the ethical considerations of the researchers.

Table 2 presents an overview of the various characteristics, termed as "Rs," that a good coding process should embody in qualitative research. Each "R" represents a unique quality, ranging from the robustness and reflectivity of the codes to their resplendence, relevance, radicality, and righteousness, serving to enhance the depth, clarity, and coherence of the analysis.

Step 4: Theme Development. A theme represents a patterned meaning within data (Braun & Clarke, 2006) as gained from data informing the research question. Moreover, the mere fact that a theme recurs or frequently appears in a data set does not mean that it is central to the meaning that is being conveyed (Braun & Clarke, 2006; Nowell et al., 2017). The research aim is to "*go through the text segments in each code (or group of related codes), and extract the salient, common or significant themes in the coded text segments*" (Estrada, 2017, p. 392). Therefore, a researcher needs to group codes together in meaningful way to represent the data. According to Creswell (2013), categories are "*components of the text that are similar in meaning and related to the research questions*" (p. 186). Categories are more concrete and specific than themes, and they are often created during the initial process of coding the data. Categories may include descriptive or factual labels that help to organize and classify the data into meaningful groups (Creswell, 2013). In contrast, themes are more abstract than categories and involve a level of interpretation and conceptualization. Themes may include patterns, trends, or relationships between different codes in thematic analysis and provide insight into the research questions or phenomena being studied (Creswell, 2013). Themes are often used to develop a conceptual framework or theoretical model that explains the relationships between the categories and the research questions (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006).

The theme is something that provides a significant link between research questions and data. A theme is based on the researcher's own thinking and observation during data collection; the researcher's observations about the data and deep theoretical understanding help them to develop themes from the codes (Carey, 2017). However, the codes are applied to the entire data by labelling extracts of data with relevant codes, thereby keeping note of any connection or potential pattern between items which may subsequently inform the development of themes (Braun & Clarke, 2006). Braun and Clarke (2006) observed that multiple codes may get assigned to a single extract. Once the entire data has been coded, the data can be collated and the search for themes can commence. Varpio et al. (2019) observed that themes are not the face value of the data, but they are the result of an analytical and comparative process exercised by the researcher to present the data in a meaningful form. Developing themes involves meticulously grouping related codes to extrapolate

Table 2. Definitions of the 6Rs for Coding in Thematic Analysis.

6Rs	Definitions
Robust	Robust coding refers to the representation of raw data in a meaningful and comprehensive manner, which encapsulates various aspects of the data under consideration
Reflective	Reflective coding involves creating codes, based on the keywords, which reflect a relationship between facts and theories and provide an interpretive lens for understanding the facts
Resplendent	Resplendent codes are rich and powerful, and provide a comprehensive explanation of the context under study; they effectively capture the essence of the data
Relevant	Relevant codes are inferential and descriptive, closely related to the research question, and are applied consistently to every piece of information with justified reasoning
Radical	Radical codes are unique and well defined, preventing overlaps, and might even offer insights that may contradict the main narrative of the analysis
Righteous	Righteous coding ensures codes logically fit within the larger coding and align with the research's purpose; they maintain consistency and understanding of the decisions made during coding

meaningful patterns that provide significant insight into the research question. This process requires the researcher's analytical judgment and a thorough understanding of the data; the categories from the coding process are transformed into more abstract themes that provide a rich, interpretative context to the data set.

The chosen methodology significantly impacts theme development in research. In an inductive approach, themes emerge from the data through descriptive or interpretive analysis, thus a comprehensive understanding is gained (Braun & Clarke, 2006). In an inductive approach, keywords emerge naturally from the data and aid in identifying initial themes, which contribute to a data-driven understanding. Conversely, deductive research applies pre-existing theoretical knowledge to data, which potentially influences theme generation (Fereday & Muir-Cochrane, 2006); so, in deductive research, selected keywords often align with existing theoretical concepts or hypotheses that assist in categorizing the data. In GT, themes are iteratively developed, allowing the flexibility to adjust to the evolving insights emerging from the data, which leads to a rich, theory-grounded understanding (Glaser & Strauss, 2017). So, in GT, keywords play a dynamic role; initially they are used inductively to identify open codes, but as the research progresses they align more with evolving theory and help in the development of axial and selective codes. Thus, keywords serve as a critical bridge between data and themes in different methodologies.

In the process of developing themes, a researcher engages in a deeper level of interpretation; they move beyond the more concrete categories derived from the initial coding process to uncover abstract patterns, trends, or relationships that shed light on the research questions (Naeem, 2020). The resulting themes provide understanding for constructing a coherent narrative that connects the quotations, keywords and themes together; this enables a thorough understanding of the data and helps to answer the research question (Naeem, 2021).

Once the keywords have been selected, they become instrumental in developing themes. These keywords serve as anchor points around which broader patterns, ideas, or themes can be identified and formed (Naeem & Ozuem, 2022b). The process of theme development involves grouping these keywords (and the corresponding coded data) into larger units of meaning. When researchers are developing themes, they return to the keywords and consider how they might be connected or related. These connections could be due to similar meanings, shared context, or relationships that emerge from the data. As themes are formed, they are typically given labels that reflect the key ideas represented by the keywords within them.

It is also worth noting that keywords continue to play a role in refining and finalizing themes. As themes are reviewed, the keywords within each theme can be checked for coherence and consistency. If the keywords within a theme are disparate or unrelated, it may suggest that the theme is too broad or unclear and needs to be further refined. So, keywords are not only the building blocks of coding, but also the seeds from which themes grow. They provide the initial guideposts that steer the analysis process and continue to shape the development and refinement of themes.

Deciding themes in thematic analysis involves a careful interpretation of patterns and relationships among codes, however, it is subject to ambiguity due to the interpretive nature of the process. Consideration of codes and keywords can inform themes, yet it may not entirely elucidate their depth and context. We propose 4Rs—reciprocal, recognizable, responsive, resourceful—to enhance the thematic decision-making process by ensuring codes are interrelated and that themes align closely with the original data, are relevant to research objectives, and provide valuable insights; hence, we address issues of ambiguity in deciding themes. These four characteristics of codes (4Rs) enable the identification of themes and are described as follows.

- Reciprocal: Themes in thematic analysis are constructed based on a mutual connection among different codes (Braun & Clarke, 2006; Denzin & Salvo, 2020). This reciprocal relationship among codes allows for the development of a new concept based on two or more codes. For instance, in the exemplar study by Naeem and Ozuem (2022a), the codes "Obscurity" and "Eminence" were constructed on the basis of the keywords "Lying," "Death rate rising," and other observations. These codes were further grouped under the second theme, "Misinformation and rumors."
- Recognizable: Themes provide a pathway to developing a theoretical or conceptual model through aligning closely with the original data set (Braun & Clarke, 2006). By analyzing keywords and codes together, recurring patterns or themes that are recognizable based on the data can be identified. Themes are recognized based on their strong alignment with the original data. In the exemplar study, the theme "Content characteristics" is a prime example of recognizability. This theme, with its two codes "Prevailing content" and "Anxiety," is easily recognized based on the keywords used, such as "Flood of information" and "Stress and distrust."
- Responsive: A theme might not directly correspond to the questions asked of participants or reflect the researcher's interests or beliefs. However, a theme should be responsive to the aims and objectives of the research (Merriam & Tisdell, 2016; Seale, 2013). All emerging themes, even those seemingly unrelated to the research questions, should be noted and reviewed for their responsiveness to the research objectives (Braun & Clarke, 2006; Morse, 2016; Thomas, 2006). In the exemplar study, all themes, even those seemingly unrelated to the original research questions, were taken into consideration. For example, the theme "Perceived consequences" might not correspond directly to the

Table 3. Definitions of the 4Rs for Theming in Thematic Analysis.

R	Definitions
Reciprocal	Refers to the mutual connection between codes in the development of a theme. It highlights the interrelationship between various codes that binds them together into a cohesive thematic concept
Recognizable	Emphasizes the importance of themes being closely aligned with, and easily identifiable from, the original data. A recognizable theme reflects recurring patterns derived from the data; it contributes to the development of a conceptual model
Responsive	Speaks to the capacity of a theme to align with and address the research's aims and objectives. Even themes that may initially seem unrelated to the research questions can be responsive if they contribute to fulfilling the overall goals of the study
Resourceful	Describes the role of themes in providing useful insights to answer research questions. Themes in this context are seen as resources that contribute to developing a story/theme that helps resolve the research issue or understand the studied phenomenon

research questions, but it responded to the research's aims and objectives.

- Resourceful: Theming involves examining codes and the extracts they come from and then grouping the codes into broader themes that display patterns (Braun & Clarke, 2006; DeSantis & Ugarriza, 2000). The researcher should also be able to tell a coherent story to explain how these codes grouped under one theme can resolve the research issue. This requires consideration of the resourcefulness of the codes, analyzing each theme for its relevance to the research question, and determining the valuable insights provided by the themes (Elliott, 2018; Harding, 2013; Lichtman, 2013; Saldana, 2021). Theming involves arranging codes into broader themes that provide useful insights to answer the research question. For example, in the exemplar study, the theme "Misinformation and rumors" helped understanding of the role of rumors and misinformation in triggering panic buying during the COVID-19 pandemic, thus demonstrating the resourcefulness of themes.

Table 3 provides definitions for the 4Rs, which are significant characteristics used in the process of theming during thematic analysis. These characteristics represent important aspects of a theme, such as its mutual connection to other codes (Reciprocal), its alignment and identifiability with the original data (Recognizable), its ability to address the research's aims (Responsive), and its role in providing insightful answers to the research question (Resourceful). Definitions of the 4Rs for themes were developed based on the above justifications.

Step 5: Conceptualization Through Interpretation of Keywords, Codes, and Themes. Conceptual, theoretical, researchers all have their own lingo for talking about their work (Tracy, 2013). A concept is defined as "*the naming of an emergent social pattern grounded in research da*ta" (Glaser, 2002, p. 24). The term "concept" refers to any mental representation of a social occurrence, such as an idea, image, thinking, or emotion (Oliver, 2021). The term "conceptualization" is used to describe the procedure of developing a working definition and refined understanding of concepts of the research (Arar, 2017). Researchers can hypothesize or look for structure or links as they progress from the specific to the general; visual aids, like maps, diagrams, and models, would be final outcomes of the conceptualization through interpretation of the research findings (Jackson & Mazzei, 2012). The researcher will first define notions before moving on to the interpretation of relevant data to create relations between different concepts to put them into a model (Patton, 2015). Interpretation indicates how the concept was developed from the data (Leidner et al., 2018) and the interpretation requires: (1) defining the range of possible interpretations (i.e., dimensions) of a concept (Gupta & Awasthy, 2021), and (2) figuring out the kinds of evidence (i.e., indicators) that might be seen (directly or indirectly) to demonstrate the presence or absence of a concept within the data (Carey, 2017). It is common practice to review the work of others to get a better understanding of how a notion has been defined and discussed before proceeding with the conceptualization process to contextualize the concept within existing research (Morse, 2016). Even though it can be difficult to tell whether or not a given conceptual definition is excellent, Naeem and Ozuem (2022a) used the following criteria to evaluate a definition's quality:

- Does the definition make the meaning of the phrases or words picked as major concepts obvious?
- Do the definitions of themes as new concepts help understanding of the research results?
- Are the definitions and explanations of the concepts accurate and reliable?
- Do the definitions of the concepts reflect the real scenario or context of the research?
- To what level of analysis does the notion of participation and theory apply to these concepts?
- How can the selected concepts be used to justify research outcomes as contributions to theory and practice?
- Are all the concepts related to each other, which would support development of a conceptual model?

The interpretation stage refers to the act of delineating the meaning of the terminology (themes) employed in the study (e.g., themes being presented through the usage of concepts and words). Therefore, at this stage the researcher needs to describe these concepts (themes and codes) in light of prior research to define these concepts in general. "*These theories are rich in description, and the theoretical boundaries have been derived from the context and not from the researcher's arbitrary goals for delimiting the scope*" (Morse, 1997, p. 188). Jackson and Mazzei (2012) suggested that the theoretical framework of research should be considered for interpretation of research findings.

Nonetheless, this paper suggests that it is usual (and vital) for researchers to query the conceptualization of a term in the context of their research findings. At this stage, a researcher can link the contribution of new concepts back to the codes and keywords as examples. In the context of building relations with the identified factors, the conceptualization of the phrases or words being used as themes and codes, which would increase the trackability of the concepts back to the real data, is important. Real data refers to the actual data collected from the research participants and the environment being studied, rather than interpretations, opinions, or assumptions. Real data are the data that are obtained through direct observation, interviews, surveys, or other research methods. Real data are essential in qualitative research as they are used to generate codes, themes, and concepts that are grounded in the participants' experiences and perceptions, rather than being imposed on the data by the researcher. By using real data, researchers aim to enhance the credibility and trustworthiness of their findings, as the data reflect the richness and complexity of the participants' lived experiences. Researchers should apply the above suggested criteria for the selection of keywords, codes, and themes that would help at this stage to conceptualize the overall research results through interpretation of the research findings with reference to the relevant literature.

Step 6: Development of Conceptual Model. The development of a conceptual model has its own importance. "*Theorizing is also work: often researchers make the mistake of submitting their study for publication without making the effort to do the conceptual work necessary for the development of theory*" (Jan, 1997, p. 163). To clarify the difference between a theoretical and conceptual model, Camp (2001) pointed out that a theoretical framework is based on an already established theory (or theories) in the literature, which has been subjected to rigorous testing and validation by other researchers and is widely accepted in the academic community. This perspective is the researcher's lens to investigate the matter in hand (Merriam, 1997). Consequently, theoretical underpinnings of research can also be applied to develop the conceptual model. Naeem and Ozuem (2022a) used TORT and PMT.

According to TORT, spreading rumors serves mostly to allay people's unaddressed worries (Buckner, 1965). PMT proposes that the primary goal of a protection motive is to explain why people have different reactions to the same fear appeals. The notion of protection motivation suggests that people take precautions in response to two considerations: the perceived severity of the threat and the confidence that they can successfully deal with it (Maddux & Rogers, 1983). The theoretical underpinning in the exemplar study also helped to justify the theoretical contribution of the study: "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" (Naeem & Ozuem, 2022a, p. 4). Therefore, researchers should provide theoretical underpinning to their final conceptual model. Grodal et al. (2021) stated that in order to apply theoretical frameworks to develop a conceptual model, it is the researcher's job to develop a novel application of the chosen theory (or theories) in a specific context to answer the research questions. Consequently, we have positioned the development of the conceptual model as the final, sixth step in the thematic analysis process (please refer to Figure 2). In this crucial stage, the researcher formulates a conceptual model grounded in the research findings to comprehensively address the research questions.

The chosen methodology not only influences the process of thematic analysis but also shapes the conceptualization of a model that encapsulates the study's findings. The use of an inductive or deductive or a mixed approach in thematic analysis and model conceptualization can significantly differ across methodologies. The nature of the methodology, the research questions, the data set, and the epistemological positioning of the researcher can all influence the choice of approach. Social constructivism, which favors a more inductive approach, guides the development of a conceptual model based on themes emerging from the data, and allows for new, subjective understandings of phenomena. An inductive approach is primarily data-driven, whereby themes are derived from the data itself without the influence of pre-existing theories (Braun & Clarke, 2006). This approach is usually adopted in methodologies that seek to develop new theories or models, such as GT or phenomenological research. Inductive methods work well in cases where no prior theory has been developed to explain the phenomenon under investigation. An excellent illustration of inductive theme analysis is seen in Naeem and Ozuem (2022a), who generate the "Obscurity" and "Eminence" codes.

Positivism, which favours deductive methods, builds its model on top of previously established theories and conducts its experiments in an unbiased manner. The deductive method relies heavily on theory. The data is interpreted via the lens of an existing theory or conceptual model (Fereday & Muir-Cochrane, 2006). Methodologies like experimental research and case study research, which aim to verify or validate preexisting hypotheses, frequently take this approach. Naeem and Ozuem (2022a) used TORT and PMT to do a deductive thematic analysis of their data. Methodologies that want to both discover new phenomena and validate or develop current theories may find a hybrid approach, which incorporates both inductive and deductive procedures, particularly effective. This method facilitates an all-encompassing comprehension of the material and can produce sophisticated, nuanced results. Naeem and Ozuem's (2022a) multifaceted strategy yielded a deep, nuanced, and theory-informed comprehension of panic buying and a useful conceptual model. The integration of inductive richness and deductive clarity in thematic analysis through the interaction of both paradigms improves the theoretical robustness of research.

The research topic, the data collection, the methodology, and the researcher's epistemological perspective all play a role in determining whether an inductive, deductive, or hybrid approach is best for thematic analysis and model conceptualization. At this pivotal stage, findings from thematic analysis and other research methods are combined into a unified conceptual model with the goal of providing an explanation for the phenomena under study. Thematic analysis is crucial in forming the final conceptual model within the framework of GT, ethnographic, and narrative techniques, and positivist-based procedures.

Identification of central themes in the data and the constant comparison procedure are integral to the construction of a conceptual model in GT (Glaser & Strauss, 2017). By repeatedly comparing and refining the developing conceptual model with newly collected data, a rich and nuanced understanding of the events under study can be attained. As a result, the model is able to capture the nuances of the cultural setting and give researchers a fuller picture of the culture under investigation (Lingard, 2019). Cultural patterns and shared beliefs discovered during the topic analysis and linked through with the keywords chosen in the second step of the thematic analysis have a significant impact on the construction of a conceptual model in the setting of ethnographic investigations.

For narrative approaches, conceptual model development focuses on personal experiences, emotions, and life histories (Eldh et al., 2020). Therefore, in narrative approaches, themes identified in the narrative data guide the creation of a conceptual model that respects individual perspectives and captures the complexity of personal experiences. In positivist-based methodologies, the development of a conceptual model starts with hypothesis generation based on identified themes. Thematic analysis thus provides a useful bridge between qualitative insights and quantitative validation in positivist research (Fereday & Muir-Cochrane, 2006). The model developed on the basis of a systematic analysis process could be tested quantitatively with the themes aiding in the interpretation of results. Therefore, positivist-based methodologies could benefit from using mixed methods to develop a model at the first stage and then test that model at the second stage of research.

In all these methodologies, the importance of a well-developed conceptual model cannot be overstated. It provides a guide for the investigation and helps the researcher identify significant factors and relationships that exist in the data. The conceptual model, grounded in a theoretical framework, also serves as a justification for the theoretical contribution of the study (Naeem & Ozuem, 2022a). Hence, researchers must exercise diligence and intellectual rigor in developing their conceptual models and leverage the strengths of thematic analysis and the specific research methodology used. Consequently, the development of a conceptual model through the use of GT, ethnographic, and narrative approaches, and positivist-based methodologies, allows for a robust, versatile, and theoretically grounded method of analysis.

Trustworthiness Criteria Through Application of Step-by-Step Systematic Thematic Analysis in Qualitative Research Paradigms

The six-step guideline presented in this paper aligns with the goal of enhancing the trustworthiness of qualitative research through thematic analysis, which is similar to the objective of Braun and Clarke's (2006) six steps of thematic analysis. However, the revised six steps in this paper build on Braun and Clarke's (2006) approach and provide additional structure and clarity, especially in the latter stages of the process, which include theme development, conceptualization through interpretation, and the development of conceptual frameworks.

Braun and Clarke's (2006) steps are: familiarizing oneself with the data, initial code generation, identifying themes, reviewing themes, defining and naming themes, and producing the report. Comparatively, the six steps proposed here present a more detailed and robust framework, which specifically focuses on the selection of keywords and quotations, the coding process, themes development, conceptual interpretation, and the final step of developing a conceptual framework.

In particular, the inclusion of keyword selection (Step 2) and the explicit guidance to develop a conceptual framework (Step 6) distinguish this new process. Researchers can be guided towards a more methodical strategy for data analysis if they give careful consideration to their choice of keywords. Choosing keywords that have a solid basis in the data and are pertinent to the research issue can improve the reliability of the study as a whole (Mischler, 1991). Fifth, a conceptual framework is developed through the analysis of keywords, codes, and themes. This method ensures the analysis is methodical and data-driven, and it lays out an organized plan for acquiring information pertinent to specific evaluation issues. A systematic and rigorous process of developing a conceptual framework through thematic analysis is ensured by the use of properly chosen keywords in the interpretation of codes and themes. Using the flexibility of deductive and inductive thematic analysis to derive inferences from the data rather than on prior assumptions or theoretical models might provide researchers with more reason to trust the results of qualitative research.

Step 6 involves the explicit construction of conceptual frameworks, which helps boost the research's overall validity by providing a well-structured interpretation of the findings. This organized interpretation provides both the theoretical grounding of future research and the practical foundation for future inquiries (Crabtree, 1999). Finally, a theoretical framework representing the study's major concepts and themes is developed. This format is helpful for sifting through theoretical and primary data because it guarantees the findings are presented in a style that is both logical and defendable by establishing links between relevant terms, codes, and overarching concepts.

Building on and improving the thematic analysis technique proposed by Braun and Clarke (2006), the new six-step strategy presents a disciplined and thoughtful approach to the examination and interpretation of qualitative data. This methodical and rigorous methodology not only positions itself as a potential foundation for future researchers aiming to enhance the validity of their thematic analysis, but it also gives a clear technique for increasing the reliability of study findings. If researchers base their thematic analysis on the data, consistently and accurately interpret the data, and zero in on the most relevant and important information, they can have faith in their findings. The developed conceptual model's theoretical and primary data landscape can be investigated using this thematic analysis approach.

Contribution and Conclusion

Using a comprehensive framework, this paper gives a flexible and methodical method for thematic analysis in qualitative research. This six-stage procedure goes above and beyond a purely inductive analysis of data by including deductive features. Of note, the framework brings clarity to the qualitative researcher and addresses common concerns such as the establishment of trustworthiness, coherence in the thematic analysis process, and the ability to substantiate findings with solid evidence. It guides the researcher in transitioning smoothly from raw data to a well-developed conceptual model:

- Step 1: Transcription, familiarization with the data, and selection of quotations.
- Step 2: Selection of keywords.
- Step 3: Coding of the data.
- Step 4: Development of themes.
- Step 5: Conceptualization through interpretation of keywords, codes, and themes.
- Step 6: Development of a conceptual model.

Although there is an apparent alignment with Braun and Clarke's (2006) reflexive thematic analysis in the initial stages, our model introduces additional parameters at each step that enhance the thoroughness of the analysis. The concepts of 6Rs (for keywords and codes) and 4Rs (for themes) are introduced at various stages for the selection of quotations, keywords, codes, and themes, and bring rigor and relevancy to the process. The Systematic Thematic Analysis Process Model also includes an exceptional step of conceptualization through interpretation. It encourages researchers to delve deeper into their data and recognize underlying themes and patterns, thus transcending the conventional descriptive approach. The framework culminates in the development of a robust conceptual model that is well supported by empirical evidence. Ultimately, this paper's unique contribution lies in its rigorous, well-structured approach to thematic analysis. The method not only enhances the depth of the analysis, but also bolsters the trustworthiness of the findings to foster robust, evidence-based research.

A step-by-step systematic thematic analysis process has been introduced, which can be used in qualitative research to develop a conceptual model on the basis of the research findings. The embeddedness of a step-by-step thematic analysis process is another feature that distinguishes inductive thematic analysis from Braun and Clarke's (2006) reflexive thematic analysis process. A qualitative researcher can carefully use our guidelines to produce a conceptual model. The inductive thematic analysis process enables a researcher to use their creative imagination and systematic processes to develop a conceptual model, and they can answer the following questions.

1. How can this thematic analysis process be used to claim rigor in qualitative research findings?
2. How can characteristics of a conceptual model be used as justification of research contribution?
3. How do presented decision guidelines for different steps of thematic analysis improve the trustworthiness and originality of research findings?
4. How can the presented thematic analysis process be employed to navigate the theoretical and original data landscape within the developed conceptual model?
5. How can the 6Rs of keywords, 6Rs of coding, and 4Rs of theming be used to improve the rigor and trustworthiness of qualitative research?
6. How can the 6Rs of keywords, 6Rs of coding, and 4Rs of theming be used for reflexivity in thematic analysis?

This paper's goal was to give readers a more in-depth explanation of thematic analysis in which six steps are adopted to develop a conceptual model on the basis of thematic analysis. In summary, the paper's unique contributions lie in the inclusion of specific guidelines for selecting quotations and keywords, a comprehensive approach to code and theme development, the addition of the step of conceptualization, and the emphasis on developing a conceptual model. These steps provide researchers with a comprehensive and nuanced approach to thematic analysis in qualitative research. This study primarily emphasizes the application of a systematic thematic analysis process in developing a conceptual framework. However, the potential of such a process to address other research contexts or quantitative methods may require further exploration. Additionally, the efficiency of our method compared to other model-building approaches has not been empirically tested.

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Ethical Statement

Ethical Approval

This study has been ethically approved and is in compliance with ethical standards.

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