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Aspects of the Coding System and Raw Qualitative Responses

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ABSTRACT

The qualitative research approach is reflected as suitable since it allows researchers to have all aspects of the participants' perceptions and involvement in a particular phenomenon. Mile et al. (2014) state the strength of qualitative data, which emphasises natural settings and real life experiences. Qualitative analysis refers to the qualitative and conceptual information, such as observation, interviews, video and audio recordings, note-taking, images and documents. A simple interpretation of the notes or transcripts is a main step in the analytic process. Researchers set notes to categorize important statements and to intend directions of coding data to categories and themes. The coding system is one of the aspects of qualitative data analysis where the researchers provide thematic analysis of data. Coding system in qualitative analysis is effective for many scholars, but it is also challenging for beginner researchers. The main purpose of the present study is to investigate the awareness level of aspects of coding and raw qualitative responses among researcher students. The study employed a quantitative research approach using a questionnaire consisting of five Likert-scale items. A total of 20 postgraduate students who participated in the research process were purposively selected as the sample. The collected data were analysed using Monkey survey software through descriptive statistics. The result indicates that descriptive coding was considered as the most effective coding aspect by fresh researchers, followed by in vivo coding and simultaneous coding. Process coding and pattern coding were found to be moderately effective, while focused coding and axial coding were perceived as less effective. Overall, the findings reveal that novice researchers tend to prefer simpler and more direct coding techniques when analysing raw qualitative data. The study offers helpful insights into the effectiveness of different coding aspects and highlights the need for training in advanced qualitative coding techniques.

Keywords: *Qualitative Research Approach, Data Analysis, Coding System, Likert-scale*

INTRODUCTION

Qualitative research plays an important role in investigating complex social problems by focusing on participants' perspectives, meanings, and real-life experiences. Unlike quantitative approaches, qualitative research highlights natural settings and seeks to understand how individuals interpret their experiences

within real-life contexts (Yin, 2015; Mack et al., 2005). This approach enables researchers to collect rich, in- depth, and contextual based data that cannot be analyzed through numerical measures alone. Qualitative data analysis is a systematic and constant process that, alongside data collection, continues the research process (Guest, MacQueen, & Namey, 2011). Qualitative data collection tools include interviews, observations, field notes, audio and video recordings, documents, and visual materials (Guest, Namey, & Mitchell, 2013). The analysis of such data needs careful arrangement, interpretation, and meaning-making in order to identify patterns, concepts, and themes related to the research problem. One of the main components of qualitative data analysis is coding. Coding is the process of labelling chunks of data to summarise, categorise, and interpret qualitative information (Auerbach & Silverstein, 2003; Adu, 2019). Through coding, raw qualitative data are transformed into meaningful units, allowing researchers to identify relationships, patterns, and themes. There are a number of coding aspects that have been developed to support qualitative analysis, including descriptive coding, in vivo coding, process coding, focused coding, axial coding, pattern coding, and simultaneous coding (Christou, 2022; Attride-Stirling, 2001). Descriptive and in vivo coding are often used in the beginning stage of analysis to remain focused on participants' responses and experiences, which is considered an easy and simple technique. Whereas more advanced techniques, such as axial, pattern, and focused coding, require such a level of understanding and skills (Majumdar, 2019; Gupta, 2024). While these coding processes enhance rigor and depth in qualitative research, they can create challenges for beginner researchers who may lack effective methodological knowledge and practical experience (Adu, 2019; Lapan, Quartaroli, & Riemer, 2011). Existing literature highlights that novice researchers generally face difficulty in selecting appropriate coding techniques, dealing with large amounts of qualitative data, and understanding the authenticity of coding process results (Hunter, 2012; Tracy, 2010). Limited awareness of coding and categories may affect the quality and credibility of findings. In order to address this gap, the present study proposed to investigate novice researchers' awareness and understanding level of different coding systems. In the account of new researchers' perception about the effectiveness of different coding techniques is essential for improving qualitative research practices, supporting certain initiatives and increasing the rigour of data analysis. Based on this gap, the research question and research objective are designed as they follow.

Research Question

What is novice researchers' awareness of the effectiveness of different coding systems in analysing raw qualitative data?

Research Objective

To assess novice researchers' awareness of the effectiveness of different coding systems in analysing raw qualitative data.

LITERATURE REVIEW: QUALITATIVE RESEARCH

The qualitative research approach is a fundamental method for exploring complex social phenomena and helps in understanding the lived experiences of people and individuals. Unlike quantitative approaches, which seek to measure and quantify variables, qualitative research is aimed at collecting in-depth and contextual data through non-numerical tools. Moreover, qualitative research methods are valuable for understanding human experiences, perceptions, and behaviour (Yin, 2015; Mack et al., 2005). The data collected through qualitative methods include interviews, observations, audio/video recordings, field notes, and documents (Guest, et al., 2013). The qualitative research approach is mainly applied in social sciences, psychology, education, and healthcare research, where an in-depth understanding of human experience is important. One of the important steps in qualitative research is the data analysis phase,

which involves interpreting rich data in a way that reflects participants' perspectives and experiences through emerging themes and patterns.

The Process of Qualitative Data Analysis

The process of qualitative data analysis is ongoing and flexible. Data analysis in qualitative research begins as soon as data collection starts and continues throughout the research process, often involving a constant cycle of data collection and modification of analysis (Guest, MacQueen, & Namey, 2011). Qualitative data analysis adapts to emerging findings, which allows researchers to maintain the complexity of the data.

One of the important techniques applied in qualitative data analysis is coding, a method that involves labelling and categorising data to summarise, identify patterns, and derive meaning from raw qualitative responses. Coding is considered the heart of qualitative data analysis (Auerbach & Silverstein, 2003). It provides a mechanism for changing complex, unstructured data into organised units of analysis. This process involves breaking down large qualitative data into separate codes that generate key concepts or themes within the data. By categorising chunks of data, researchers can organise their findings and identify relationships between different segments. This arrangement helps reveal large patterns, contributing to the development of theoretical insights and understanding of the research phenomenon (Attride-Stirling, 2001).

Therefore, qualitative researchers must choose among various coding techniques, each with its own effectiveness and challenges. For instance, techniques such as descriptive coding allows researchers to remain focused on participants' responses and preserves the meaning of their responses. It supports them in the initial stages of analysis. On the other hand, more advanced techniques such as axial and pattern coding requires analytical skill, which can help to identify complex relationship and major themes that may not be immediately visible from the raw data. The selection of coding techniques can significantly impact the quality and depth of the analysis, as it determines how the data is categorised, interpreted, and connected to the research question. As a result, the coding process is not only about labels, but also about making critical decisions that guide the interpretation of qualitative data and, ultimately, the research findings.

Coding in Qualitative Research

The Role of Coding in Qualitative Research

Coding is vital for organising a large amount of qualitative data. It helps to identify repeated patterns and themes within data and can be approached through a variety of strategies. Auerbach and Silverstein (2003) state that coding is the process of systematically organising rich data to facilitate interpretation. This process helps researchers break down large data and generate labels or “codes” that allow a detailed understanding of the phenomenon under investigation. Coding techniques are categorised into several types; each serves a different purpose during analysis (Gupta, 2024; Christou, 2022). For instance, descriptive coding summarizes data in a simple manner by categorizing it based on content or subject, while more advanced techniques such as axial or focused coding demand such levels of conceptual and analytical awareness (Majumdar, 2019).

Types of Coding Systems

There are several types of coding aspects that exist in qualitative research; each refers to different phases and requires a different level of understanding in analysis. An overview of some common coding systems used in qualitative research is given as follows.

1. **Descriptive Coding:** This is often applied in the early stage of analysis. Descriptive coding involves summarizing raw data into basic categories codes that allow researchers to be focused. Initially, it is useful when researchers seek to organise data without losing connection to the original context (Guest et al., 2011).

2. **In Vivo Coding:** This type of coding involves using participants' own words or phrases as codes. This technique allows researchers to understand participants' lived experiences, making it useful in understanding the meanings of individuals related to their experiences (Auerbach & Silverstein, 2003).

3. **Process Coding:** This method is used to capture actions, behaviours, or processes within the data. It is useful when a researcher is interested in understanding dynamic events and changes over time (Majumdar, 2019).

4. **Focused Coding:** Focused coding helps to identify the significant and frequently occurring codes in the data. It helps researchers to move beyond the initial stage and begin to form more complex themes and categories (Guest et al., 2011).

5. **Axial Coding:** In axial coding, researchers aim to explore the relationship between different codes identified in the early stages of analysis. This technique is commonly used to develop abstract categories by linking them with conceptual relationships, such as cause-and-effect (Christou, 2022).

6. **Pattern Coding:** Pattern coding is considered a more advanced stage of analysis to combine similar codes into broader categories and themes. This process helps researchers identify patterns that emerge from the data (Attride-Stirling, 2001).

7. **Simultaneous Coding:** This technique allows researchers to generate multiple codes for a single data segment, recognising that data may present more than one theme. Simultaneous coding is used when the data are complex and multifaceted (Gupta, 2024).

Challenges in Coding for Novice Researchers

Coding is an essential and powerful tool of analysis in qualitative research; it presents several challenges, especially for novice researchers. For those who are new to the research field, the coding can seem like a barrier due to the complexity and flexibility of the process. One of the basic challenges faced by researchers is selecting the most appropriate coding system for the data at first. Due to the variety of coding techniques, such as descriptive coding, in vivo coding, axial coding, and pattern coding, choosing an approach that aligns with the research question and the nature of the data can be difficult. Insufficient selection of a coding technique can result in excluding important information and incomplete analysis, therefore compromising the validity of the findings (Lapan, et al., 2011; Guest, et al., 2011).

Another common challenge is managing rich qualitative data. Qualitative research often conducts a substantial amount of raw data, such as interview transcripts, field notes, and audiovisual recordings.

Organising and categorising such extensive data can be time-consuming and difficult, especially for novice researchers who lack experience in working with large datasets. This may lead to issues related to data completion or the omission of important themes due to poor practices in data organisation (Tracy, 2010).

Maintaining consistency in coding is also a major challenge. Because coding requires labelling units of data, it is essential that these codes be applied consistently across the entire data analysis process. Novice researchers may face difficulty to apply codes equally, which can result in inconsistencies in data interpretation. Such inconsistencies can weaken the reliability of the analysis, particularly in studies where different researchers may apply codes in slightly different ways (Auerbach & Silverstein, 2003; Lapan, et al., 2011). Without careful supervision and regular checks, these inconsistencies can obscure the analysis and reduce the credibility of the results.

Moreover, novice researchers are likely to face difficulties when engaging with more abstract coding techniques, such as axial or pattern coding. These aspects require a higher level of awareness and are commonly used to identify relationships between categories and to reveal emerging themes. For researchers without significant experience, the application of such advanced coding aspects can be challenging, as it demands understanding of how themes are interconnected and how various coding categories can be integrated into coherent, theoretical insights (Majumdar, 2019). In such a condition, researchers may unintentionally misinterpret the data during analysis, leading to superficial and inaccurate conclusions. Therefore, the need for understanding coding techniques is widely emphasised in the literature. Without training and practice, researchers may lack the practical skills required to apply advanced coding methods effectively, and it leads to missed insights and misinterpretations. A practical solution that provides experience in coding and allows researchers to learn through application is essential to tackle these challenges (Adu, 2019; Tracy, 2010). Additionally, guidance on how to interpret and refine codes, especially within large and complex data, would help researchers maintain rigor throughout the analysis process. The research studies indicate that coding has the quality and trustworthiness of qualitative research. However, practically learning coding skills is crucial to ensuring that findings accurately present the depth and complexity of participants' real-life experiences.

This literature review presents the important role of coding in the qualitative data analysis process and its importance in converting raw qualitative responses into meaningful interpretations. A range of coding systems, from descriptive and in vivo coding to axial, focused, pattern, and simultaneous coding, provides researchers with different analytical techniques suited to different stages of analysis. While these techniques enhance analytical rigor, they also create notable challenges for novice researchers.

Existing literature suggests that novice researchers tend to favor coding techniques that are closely aligned with raw data, whereas more advanced methods require such expertise (Auerbach & Silverstein, 2003; Guest, et al., 2011; Majumdar, 2019). Despite methodological guidance on coding processes and analytical strategies (Attride-Stirling, 2001; Adu, 2019), limited empirical attention has been given to novice researchers' perceptions and awareness of the effectiveness of different coding aspects when working on raw qualitative responses. Addressing this gap, the present study examines postgraduate students' awareness level and perceived effectiveness of various coding techniques. Therefore, the present study contributed empirical insights that inform qualitative research preparation and methodological practice.

RESEARCH METHOD

This study employed a quantitative research method to examine novice researchers' level of awareness about coding aspects and raw qualitative responses. A survey questionnaire was used to collect data,

apply systematic analysis of participants' responses on the effectiveness of different coding techniques was applied.

Sampling

The sample of the study includes postgraduate students engaged in research, especially beginner researchers, due to their limited experience in qualitative analysis. Using purposive sampling, a total sample of 20 students was selected for this study, ensuring voluntary participation.

Research Instrument

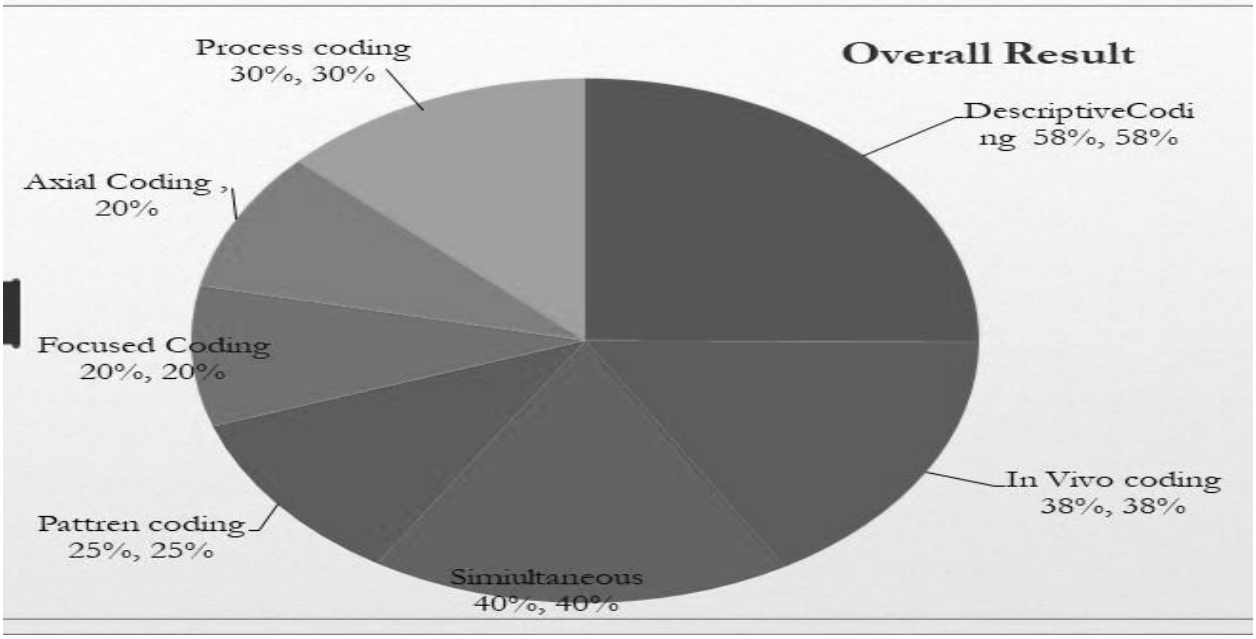
Data was collected through a quantitative survey questionnaire focusing on various coding techniques (descriptive, in vivo, process, focused, axial, pattern, and simultaneous coding). A Likert-scale format was used to quantify participants' perceptions and level of understanding. These items were developed based on existing research. Participants were informed about the study purpose, and consent was obtained. Questionnaires were distributed and collected upon completion. Participants' confidentiality and voluntary participation were maintained throughout. Data were analyzed using monkey survey software, employing descriptive statistics to summarise participants' responses. This approach was appropriate as the study aimed to explore awareness and perceived effectiveness rather than test causal relationships.

RESULTS

This study presents the findings of the study on novice researchers' perceptions of the effectiveness of different coding systems in analyzing raw qualitative data. The overall results indicate varying levels of perceived effectiveness across different coding techniques.

The study examined seven coding approaches: Descriptive coding, Simultaneous coding, In Vivo coding, Process coding, Pattern coding, Focused coding, and Axial coding. The overall perceived effectiveness, measured as a percentage of participants rating each method as effective, is summarized in pie chart 1.

Table 1: *Pie Chart of perceived effectiveness of coding system.*



The result indicates that descriptive coding was perceived as the most effective coding method by novice researchers, with 58% of participants rating it positively. This suggests that simpler and more straightforward coding approaches are preferred by beginners, likely because they allow researchers to be focused on participants' responses and experiences without requiring analytical expertise. Simultaneous coding and In Vivo coding were rated moderately effective, with 40% and 38%, respectively. These methods, while slightly more complex than descriptive coding, still maintain a connection to the raw data, which may explain their moderate acceptance among novice researchers.

Process coding (30%) and Pattern coding (25%) were perceived as less effective. These coding techniques require more analytical skills, which may explain the lower preference among researchers with limited experience in qualitative data analysis. Finally, Focused coding and Axial coding were the least preferred methods, both at 20%. These approaches involve synthesizing and organizing data at a conceptual level, which may create challenges for novice researchers who have no experience in advanced qualitative coding techniques.

Overall, the findings indicate a clear preference among novice researchers for simpler and more direct coding strategies, while advanced coding methods that require more efforts and skills are less favored. This result is consistent with prior literature suggesting that beginners in qualitative research often struggle with complex coding approaches and benefit from training in more sophisticated techniques (Adu, 2019; Hunter, 2012; Tracy, 2010).

Findings indicate that novice researchers demonstrated the most perceived effectiveness for descriptive coding, followed by simultaneous and In Vivo coding, whereas more complex coding methods, such as pattern, focused, and axial coding, were rated lower. This highlights the importance of providing training and support to enhance novice researchers' competence in advanced qualitative coding methods and improve the overall rigour of qualitative data analysis.

DISCUSSION

The present study investigated novice researchers' perceptions and awareness of the effectiveness of different coding systems in analysing raw qualitative data. The findings indicate that descriptive coding is perceived as the most effective method, followed by simultaneous coding and In Vivo coding, whereas focused coding and axial coding were rated the least effective. These findings suggest that novice researchers prefer simpler and more direct coding strategies. Descriptive coding, which involves labelling data with simple summaries, allows researchers to connect with participants' responses and experiences. This aligns with existing literature emphasising that novice researchers' guidance in coding methods minimize concept of complexity during the first stage of qualitative analysis (Adu, 2019; Hunter, 2012). Second preference for simultaneous coding and In Vivo coding indicate that participants are somehow comfortable engaging with coding aspects that recall participants' exact words but require slightly more methodical efforts. In contrast, the lower perceived effectiveness of process, pattern, focused, and axial coding suggests that these more advanced coding techniques create challenges for inexperienced researchers. These methods require a higher-level concept and the identification of underlying data chunks, which may be difficult for those with limited qualitative practice (Tracy, 2010; Lapan, et al., 2011). The results highlight an important implication for qualitative research exercises: novice researchers require planned guidance and practice in advanced coding techniques to enhance logical rigour. Providing workshops, step-by-step coding exercises, and examples of complex coding strategies can improve their skills and ability to apply techniques like axial and pattern coding effectively.

Overall, the present study shows a clear preference among novice researchers for coding techniques that are simple, practical, and closely related to raw data, while more intellectual or analytical coding methods

are less preferred. This study contributes to methodological development in qualitative research by emphasising the need for practical interventions for beginner and fresh researchers.

CONCLUSION

The present study examined novice researchers' perceptions and awareness of the effectiveness of various qualitative coding systems in analysing raw data. The findings indicate that descriptive coding was perceived as the most effective method, followed by simultaneous and In Vivo coding, while advanced techniques such as process, pattern, focused, and axial coding were rated lower in effectiveness. The result suggests that novice researchers tend to prefer simple and direct coding strategies that allow them to understand participants' language and real life experiences, whereas more theoretical and analytical coding aspects can be challenging due to the higher level of understanding required. The study highlights the need for preparation and practical guidance to improve novice researchers' competence in applying advanced coding techniques, enhancing the rigour and credibility of qualitative data analysis. The overall findings contribute to a better understanding of coding preferences among beginner researchers and emphasize the importance of providing practical support to facilitate the effective use of different coding methods in qualitative research.

RECOMMENDATIONS AND LIMITATIONS

Based on the findings of this study, it is recommended that novice researchers receive proper guidance in qualitative coding techniques, particularly in advanced methods such as axial, focused, and pattern coding. Providing step-by-step guides, practical examples, and exercises can help beginners to develop understanding and competence in applying complex coding aspects. Moreover, supervision and peer support during the coding process may improve their skills and encourage practicing more, which eventually improves the rigor and credibility of qualitative data analysis.

This study has several limitations. First, the sample size was small (n=20) and consisted only of postgraduate students, which limits the generalizability of the findings to other populations and research contexts. Second, the study relied on self-reported perceptions, which may be influenced by participants' prior experience and familiarity with coding methods. Finally, this research focused on the perceived effectiveness of coding systems, rather than evaluating actual coding performance or outcomes, which may differ from participants' individual assessments. Despite these limitations, the study provides valuable insights about novice researchers' coding preferences and highlights areas where practical and methodological support can be required to improve qualitative research practice.

FUTURE RESEARCH

Future research can build on the findings of this study by exploring novice researchers' engagement with qualitative coding in broader and different contexts. Studies with larger and mixed samples across different academic disciplines and career stages could help determine whether the observed preferences for simpler coding strategies are consistent across populations. Additionally, longitudinal studies pursuing researchers' coding preferences and skills over time would provide insights into how experience and training influence the adoption of advanced coding techniques. Investigating the impact of practical implications, such as workshops, supervision, or guided coding exercises, on the effectiveness and awareness of novice researchers could further inform best practices in qualitative research education.

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