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The Sample Size Adequacy-Saturation Conundrum in Digital Qualitative Research

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Abstract

The rapid expansion of digital qualitative research has enabled researchers to access diverse data sources and platforms, reach people from different backgrounds and break geographical limitations when sampling, thus enhancing the quality, depth and breadth of research. However, an ongoing methodological dilemma concerns how researchers address the intertwined concepts of sample size adequacy and saturation. Through a synthesis of literature on sampling strategies, the evolution of the saturation point, the unique characteristics of digital data, technological affordances and the complexities associated with collecting data in digital contexts, the research established that digital contexts further complicate the sample size adequacy-saturation conundrum.

Keywords: *Adequacy; Qualitative Research; Conceptualisation; Sample Size; Saturation*

1. Introduction

Qualitative research generally differs from quantitative research in the methodological approaches adopted, especially concerning sample size selection. Contrary to quantitative studies that seek statistical generalisation and employ large (representative samples), qualitative research emphasises richness, depth, and contextual understanding of phenomena being studied (Andriotis, 2024), thus employs small samples. Qualitative inquiry allows findings to be applied from specific contexts to wider contexts, instead of the generalisability of findings. Sampling in qualitative research is concerned with obtaining rich information by assessing different opinions from the population. Sharma et al (2024) posit:

"There are well-established rules and methods about sample size estimation in quantitative research approaches. However, qualitative research approaches justify very little about sample size estimation principles and largely depend on subjective judgements and arbitrariness. Contrarily, an adequate sample size is essential for a study to address the core elements of validity and credibility in qualitative research, too, such as rigor, trustworthiness, conformability, and acceptance".

The difference in sample size estimation in qualitative and quantitative approaches not only results in qualitative research having typically smaller samples compared to larger samples for quantitative studies, which raises concerns about the research quality in qualitative research. This leads to the credibility of findings in qualitative research being controversial and contested amongst scholars. The principle of saturation is applied as a measure of methodological rigour in qualitative research. Therefore, the concept of saturation is critical in ensuring rigour and justifying sampling decisions and sizes in qualitative research (Guest et al., 2020; Hennink, 2023; Lu et al., 2024; Sebele-Mpofu, 2021; Xie & Chen, 2021), but it is not without problems. Nelson (2017) and Lowe et al. (2018) raise concerns regarding the definition, measurement, and process of assessing the concept.

The main challenge in qualitative research centres around two interconnected concepts, which are sample size adequacy and saturation. Sample size adequacy demands that the selected sample is both appropriate for the research objectives and sufficient to generate comprehensive and rich data to address research questions. The saturation concept is broadly recognised as a signal for "information redundancy" or the point at which no new themes, information and patterns emerge from the gathered data (Braun & Clarke, 2021; Naeem et a., 2024), suggesting that any further data collection is futile (Saunders et al., 2018; Sebele-Mpofu, 2020; Sim et al., 2028). Hennink et al. (2017:591) explain, "Saturation is a core guiding principle to determine sample sizes in qualitative research, yet little methodological research exists on parameters that influence saturation". Adding to the contestations, Ahmed (2025) avers, "Despite its central role, debates persist regarding the point at which saturation is achieved, especially as it varies across qualitative methodologies such as grounded theory, phenomenology, and ethnography". Naeem et al. (2025) avow that the semantic debate and mystification on how many rounds of research are adequate to reach saturation or what criteria are used to measure its attainment adds to the controversy. The different views by researchers suggest a dilemma in the application of the concept of saturation in qualitative research. The inherent conundrum stems from the fact that while the saturation principle is frequently used as justification for sample sizes or an emergent outcome for data analysis, the concept cannot be definitively predicted, calculated apriori, aposteriori, or defined with consensus among researchers.

Therefore, a fundamental concern exists in qualitative research contexts, where saturation is generally described as the "gold standard" for credibility and rigour as well as "sample size estimation" (Hennink, 2023). Sebele-Mpofu (2020) portends that "It is viewed as a contemporary measure to alleviate the subjectivity in qualitative research, a yardstick for estimating sample sizes in qualitative research as well as an assurance for rigour and quality". The need to justify the attainment of the saturation puts pressure on researchers to claim to have reached the point of saturation in their reports, especially when seeking validation from external bodies like funders, examiners, and journals. However, researchers have observed that in most cases, upon closer examination of the research methodology section, the saturation concept is largely ill-defined, lacks clear criteria, and the saturation attainment process is often not adequately and comprehensively unpacked (Braun & Clarke, 20121; Sebele-Mpofu, 2020). Lu et al. (2024) argue, "Data saturation, a critical concept in ensuring the rigor of qualitative research, remains inadequately defined in terms of sample size and assessment criteria across various studies". Researchers argue that in some cases, the saturation principle is employed as a rhetorical tool to rationalise sample sizes rather than as an outcome of intentional methodological choice (Constantinou et al., 2017). Affirming the argument, Tight (2024) posits "Saturation is, however, used and understood in a variety of ways, often appearing as an unevidenced and dogmatic statement seeking to justify that a piece of research is complete". The researcher further describes the saturation as "both a misunderstood and overworked concept". The arguments point to a performative feature of how researchers report on the principle, where the claims for saturation attainment are prioritised over the substantive methodological work required to reach the point and transparently demonstrate its achievement. Employing the saturation concept for justification purposes without comprehensively explaining the steps taken to foster its

attainment risks undermining the actual quality that it purports to guarantee, possibly resulting in the misrepresentation of findings.

Buckley (2022) suggests ten steps for explaining saturation in qualitative research to enhance clarity in its reporting. These steps include (1) definition of foundational disciplinary frameworks (2) clear specification of the target class (3) showing the inclusion and exclusion criteria for selecting participants or cases (4) explaining techniques used to reduce biases in participant selection (5) explain the heterogeneity or homogeneity of the sample in the context of the study (6) explain the process of gathering or extraction of information (7) "select code, meaning or model saturation (8) specify concept or code fitness (9) report randomisation and order of cases (10) explain the outcomes of post facto assessments of saturation.

The emergence of digital technologies has greatly shaped the context of qualitative research, creating digitally supported data collection platforms and methods. This new context offers significant opportunities for data gathering through different methods such as a virtual interview, digital ethnography, and social media analysis. The increase in the volume, variety, and velocity of data in digital contexts raises questions for the principle of saturation in digital qualitative research (DQR). The digital methods of data collection introduce an array of complexities that further complicate the traditional sample size-saturation dilemma. For example, the dynamic nature of digital data makes the issue of no new information, data, or insights a non-static target. Additionally, new ethical dilemmas concerning informed consent, data privacy and management, and confidentiality of personal information in the era of digital footprints further cloud the saturation attainment issue. The use of digital technologies such as machine learning (ML) and artificial intelligence (AI) increases the challenges associated with digital data analysis and associated ethical implications (Magida, 2024; Ntsobi et al., 2023; Mpofu, 2025).

Perez (2024) explains that qualitative sampling has become complex in the era of big data and requires careful negotiation, especially now with access to heterogeneous groups. Therefore, the digital context adds new complexities and broadens the nature and scale of ethical dilemmas, raising questions for methodological rigour and ethical considerations. This paper examines the sample-size adequacy-sFaturation conundrum in the context of DQR.

2. Literature Review

This section reviews literature on the foundational conceptualisations of the sample size adequacy and saturation principle to give insights into the origins and evolution of these two important interlinked concepts that are critical to understanding the dilemma associated with the interlink in the traditional qualitative settings, laying a groundwork for assessment of the conundrum in DQR contexts. The section also discusses the sample size adequacy-saturation dilemma (challenges in determining sample size and reaching saturation point) as well as the factors affecting the relationship between sample size adequacy and the attainment of saturation in qualitative research in general, setting foot for exploring how these factors have evolved in the DQR landscape to enhance or compromise sampling for the achievement of saturation.

2.1 Foundational Conceptualisations for Sample Size Adequacy and the Saturation Concept

Various researchers suggest four different ways of estimating sample sizes: (a) conceptual models, (b) rules of the thumb, (c) the principle of saturation and (d) statistical supports methods for sample size determination in qualitative research (Sharma et al., 2024; Sim et al., 2018). This study focuses on the saturation principle.

The core of qualitative research lies in its clear conceptualisation of sample sizes and justification for the samples selected (Sebele-Mpofu, 2021). Hence, the need to clearly explicate the importance of sample size-adequacy, the dilemma associated with what is considered adequate sample size in qualitative research, how the lack of consensus on what is considered a sufficient sample sizes poses complexities for the concept of saturation and how the opportunities and challenges associated with DQR further amplify the intricacies associated with not only the definition of saturation but also its attainment and adequate sample sizes to support saturation (Mpofu, 2025).

This section gives an insight into the foundations of the two key concepts, sample size adequacy and saturation, as they interact in strengthening qualitative research processes and enhancing the quality of findings.

2.1 .1 Sample Size Adequacy in Qualitative Research

Sample size adequacy in qualitative research is a multidimensional concept that covers both the appropriateness (relevance) and sufficiency (adequacy) of the selected participants. Appropriateness is concerned with whether the sample precisely align with the research objectives. This is generally achieved through employing non-probability sampling techniques, especially purposive sampling, which involves researchers intentionally choosing information-rich participants or groups that have an in-depth understanding of the phenomenon being investigated (Sebele-Mpofu, 2021). Hence, the inclusion and exclusion criteria for selecting research participants are guided by the quest for participants who can provide relevant, rich, and insightful data.

Sufficiency describes the collection of enough data to give a detailed and multifaceted understanding of the phenomenon under investigation, emphasising the richness and depth of information over (quality), rather than just the quantity of data collected. Along with this principle, researchers suggest that if participants are informationally rich, to provide rich data, including different and/ or converging perspectives, which are critical for answering research questions, smaller samples may be considered enough (Malterud et al., 2021). In this case, there is a shift in focus from just striving for the point of data redundancy to assessing the interpretive strength and utility of data gathered. As outlined by Malterud et al. (2016:) information power is influenced by five pivotal dimensions, which include the (1) the study aim, (2) the specificity of the sample, (3) the use of established theory, (4) the quality of dialogue during data gathering, and (5) the analysis strategy adopted for the study. Malterud et al. (2021) explain that sufficiency of the sample must be based on the evaluation of its capacity to provide answers for the research question throughout all the stages of the research, from planning, data collection, and analysis to dissemination of findings. The researchers argue that while saturation is the prevailing concept for determining sample sizes and the criterion for stopping data gathering in qualitative studies, the inconsistency and naivety in its application suggest that information power might be an alternative (Malteru et al., 2021). These arguments point to the need for a framework that offers multidimensional perspectives on sample size, moving beyond just simply the number of participants selected and themes generated towards the content of the data collected (qualitative judgement of data richness and usefulness).

Hennink and Kaiser (2022) unpacking sample sizes that enable the attainment of saturation, point out that studies with a homogenous group of participants achieved saturation within a range of 9-17 interviews or FGDs of between 4 and 8. The researchers also established that most studies reviewed in their study largely used homogeneous populations and assessed the achievement of code saturation. Hennink et al. (2017), looking at saturation achievement with 25 interviews, established that code saturation was attained at nine interviews (identification of thematic issues), meaning saturation (comprehensively nuanced understanding of the aspects of the phenomenon being investigated) at between 16 and 24 interviews. Hennink et al. (2019) explained that four focus groups were enough to reach code saturation, yet more groups were required to achieve meaning saturation.

2.1.2 The Saturation Concept

The principle of saturation has its origins in the grounded theory methodology by Glaser and Strauss (1967). Within the framework of the grounded theory, the concept was specifically referred to as "theoretical saturation" (Aldiabat & LeNavenec, 2018; Jennings & Yeager, 2025; Ünlü & Qureshi, 2023). Theoretical saturation concept is not only concerned with ceasing data collection when repetition of core concepts of the theoretical framework occurs, but instead it is a continuous, iterative, and data-driven process of simultaneous sampling, data gathering, and analysis, generally known as theoretical sampling. The sampling process continues to the point where all the categories and theoretical constructs associated with the phenomenon are fully developed, exhausted, and developed to support an emerging theory. Theoretical sampling focuses on the sufficiency of the sample to offer conceptual richness and depth for theory development as opposed to just the size of the sample (how many participants, interviewees, groups, or cases). The foundational conceptualisation of the concept accentuates the deep emphasis on the comprehensive understanding of the phenomenon and the interpretive power of the data collected. However, the concept of saturation has broadly expanded beyond the grounded theory origins and conceptualisation, consequently leading to different modes and interpretations in various qualitative research designs and methods. These include theme, data, meaning, and code saturation (Jennings & Yeager, 2025). Yang et al. (2022) explain, "due to the diversity of saturation and its judgment standards, the relationship between different kinds of saturation is complicated and ambiguous. …., which leads to vagueness of the concept of saturation and many difficulties in evaluation."

Saunders et al (2018) point to inconsistencies in how the concept of saturation is conceptualised, operationalised, and used in qualitative research. The researchers identify four different approaches to the concept, which are distinct based on whether deductive or inductive reasoning is applied and the emphasis on theorising, data collection, and analysis. These encompass theoretical saturation (sampling), inductive thematic saturation (analysis), a priori thematic saturation (sampling), and data saturation (data collection) (Saunders et al., 2018). In the widening of the saturation principle, some researchers present different forms, some of which combine two or more of the forms presented by Saunders et al. (2018), making the conceptualisation of the concept opaque. For example, early researchers on the concept, such as Morse (1995) and Goulding (2005), argue for the saturation of both theory and data, while Drisko explicates the principle from the angle of both nuanced data collection and analysis. Morse (1995) alludes to saturation as the point where the research domain has been fully sampled and there is replication of data. Morse (2015:588) extends the explanation of the concept as the point where examples of categories of the phenomenon being studied can be readily provided by the researcher, and there are enough to "identify characteristics of the concepts and develop theory". The viewpoint is that both data and theoretical saturation are vital components of the concept. Chitac (2022) describes data saturation as "a complex phenomenon expanding beyond the theoretical rationale experienced as a before, during and after an iterative and reflective process of engaging with research participants and data (i.e, triangulation of sources, disciplinary traditions, researcher's experiences and participants' willingness and readiness to share), which anchors the researcher's decision to resume data collection". Therefore, the different viewpoints further complicate the definition, determination and measurement of saturation, more-so in the DQR environments

Saunders et al. (2018) present four forms of saturation. These include code saturation, which is concerned with the point where the stabilisation of the code book occurs and there are no new additional issues emerging from the data, implying a combination of data and thematic saturation. Codes can be developed both inductively and a priori, suggesting the existence of both a priori and inductive thematic forms of saturation. As explained by Saunders et al. (2018), the other three encompass thematic saturation (both a priori and inductive), theoretical saturation, and meaning saturation. Hennink et al. (2017) make a distinction between code and meaning saturation, with meaning saturation relating to the comprehensive or complete understanding of the conceptual codes or the varying conceptual perspectives (which is

closely linked to theoretical saturation). The researchers explain, "Thus, code saturation may indicate when researchers have 'heard it all', but meaning saturation is needed to 'understand it all'" (Hennink et al., 2017). The question is, at what point has the researcher heard everything and understood it all? Jennings and Yeager (2025) posit that the migration from the singular theoretical saturation type to several modes poses complexities in applying the principle. The authors further explain, "There is a lack of clarity among saturation types and a lack of transparency in reporting what is meant by saturation and how it was achieved", together with the relevance of the concept to qualitative methodologies out of the purview of the grounded theory. What is evident in the conceptualisation and operationalisation of the saturation principle by researchers is that it cuts across all the different stages of the research process, from sampling to data analysis and interpretation of findings.

Rahimi (2024) describes saturation as an evolving concept that is context-dependent. The evolution of the concept has not only not resulted in its expansion, but also the dilution of its inception or seminal meaning, changing it from a principle that offered guidance for comprehensive theoretical development to general sample size justification. This expansion and transformation of the concept provides a fundamental point in understanding the sample size-saturation conundrum. This dilemma is evident in some cases where researchers prioritise claiming and reporting the achievement of the saturation point over genuinely attaining it in a methodologically convincing way, potentially weakening the richness and depth of qualitative findings.

Owing to the complexities and controversies linked to the concept and its underlying assumptions that are both within and outside the grounded theory methods (Sebele-Mpofu, 2021), Saunders et al. (2018) contend that "saturation should be operationalized in a way that is consistent with the research question(s), and the theoretical position and analytic framework adopted, but also that there should be some limit to its scope, so as not to risk saturation losing its coherence and potency if its conceptualization and uses are stretched too widely". Jennings and Yeager (2025) emphasise the need for a critical assessment of the concept and the conceptualisations of clear definitions to assure consistency and understanding of the principle.

The six different forms of saturation identified from the literature on the conceptual foundations of the concept are presented in Table 1

Table 1: Key Forms of Saturation, Description, Main Focus, and Context

Form of Saturation	Description	Focus/Stage in Research Journey	Context	References
Theoretical Saturation	Theoretical categories of data are fully identified and developed, aligning with their properties, concepts and relationships, No additional data for theory development are found	Sampling and theory development	Grounded theory	Glaser & Straus, 1967; Goulding, 2005; Morse, 1995; Saunders et al., 2018;
Data Saturation	No new themes, information or patterns emerge from the data, rendering further data collection redundant. Focuses on breadth of collected data	Data collection	General Qualitative Research	Chitac, 2022;; Morse, 2015; Saunders et al., 2018
Inductive Thematic Saturation	The point where broader themes are complete and there are no emerging themes from analysing the data. Used interchangeably with code analysis by some researchers	Analysis	General Qualitative research	Saunders et al., 2018

Apriori Thematic Saturation	The extent to which identified themes and codes are sufficiently exemplified in the data	Sampling	General Qualitative Research	Saunders et al., 2018
Code Saturation	No additional codes emerge to fully describe or categorise the data	Analysis	General Qualitative Research	Hennink et al., 2017; Hennink & Kaiser, 2022
Meaning Saturation	The point where there is a full comprehension of the issues under investigation, including all the dimensions and nuances of the phenomenon having been achieved. No additional insights are emerging from the data Focuses on depth of collected data.	Analysis and Interpretation	General Qualitative Research	Hennink et al., 2017

Source: Author's Compilation

In addition to the six forms summarised in Table 1, van der Burg et al (2025) introduce two other forms of saturation, which include perspectival and reflective saturation. The researchers further portend that saturation must be understood as a gradual rather than a definitive or one cut-off point.

2.2 The Sample Size Adequacy-Saturation Conundrum

A prominent challenge characterising qualitative research is the absence of definitive guidelines for calculating or selecting sample sizes, when compared to quantitative research, which depends on clear numerical guidelines for sample size estimation that allow for statistical generalisation (Sharma, 2024). The lack of explicit guidelines has resulted in the principle of saturation becoming a frequently invoked tool to justify sample size and qualitative rigour in qualitative studies. Acknowledging that qualitative researchers often face questions relating to sampling guidelines, techniques and sample size adequacy as well as the cogency of data collection and analysis, Mpofu (2021) affirms "saturation has been considered a fundamental yardstick to help answer the problematic questions on sampling decisions and to boost validity and rigor in QR". Saturation has been considered a fundamental yardstick to help answer the problematic questions on sampling decisions and to boost validity and rigor in QR (Daher, 2023). Notwithstanding the importance of saturation emphasised by different researchers and its widespread adoption in sample size estimation, the concept is criticised for being poorly defined, lacking clear conceptualisation and operationalisation criteria and with researchers in some cases merely reporting on the concept as an expectation or justification tool without clearly outlining and descriptively detailing the how and when parts of the attainment process (Sebele-Mpofu, 2020). The controversy on the saturation concept discussed in the previous section stimulate a great deal of questions and queries on its application to justify sampling guidelines (techniques, sample sizes, and adequacy of samples), data collection, as well as analysis. Jennings and Yeager (2025) posit, "The term saturation is in reports of qualitative research. The term is often used, however, as a throwaway line, sans definition, rationale, or explanation of the process. Consequently, there remains a question about what is meant when saturation is used". This lack of clarity leads to the substance of saturation being overshadowed by the rhetoric of saturation, superficially justifying methodological rigour and clouding transparency in reporting the research process, thus adding to the challenges of subjectivity sampling decisions in qualitative research. The saturation controversy is likely to heighten in DQR contexts due to the intricacies associated with sampling, data collection, analysis, and interpretation in digital research settings.

A sticking point or source of controversy in qualitative research methodology emanates from the conflict between a priori sample size estimation and the emergent characteristic of saturation. While in quantitative research, sample sizes are numerically determined in advance, contrarily in qualitative research, there is generally a broadly outlined sampling plan, with adequate sample sizes iteratively emerging as the research is conducted or data collection is happening, shaped by the research questions

and findings (Saunders et al., 2018; Sebele-Mpofu, 2020). This builds a practical dilemma, as saturation is technically an outcome or result of the data analysis process, implying that it cannot be predicted with certainty or established before the data collection process starts. Another source of disputation is that while researchers often argue that sample size determination will be influenced by the data saturation or one form of saturation, it is often driven by a priori estimations, especially in cases where this is mandatory for institutional ethical clearance processes and funding applications. This inconsistency between theoretical determination and the practical expectation of selecting sample sizes poses significant difficulties for researchers, as they try to reconcile administrative requirements and emerging data, patterns, information, and insights that are expected to genuinely shape the concept of saturation.

The application of the saturation concept becomes challenging, especially in exploratory qualitative research studies or in studies where research questions are expected to evolve or are fully developed during data collection. Problems are also more likely to arise now with digital environments and data collection from digital platforms, where data is not static but continuously evolving (Costa, 2023). In this case, new insights, information, and problems continue to emerge during data collection. Therefore, this challenges the traditional notions of saturation, which define the principle as the point of "data redundancy", where no new information, codes, themes, and insights emerge, as saturation becomes a dynamic and elusive target. As research questions are fully refined or new ones are formulated during the study, what constitutes saturation at one point may be insufficient for another. Therefore, the discussion points to both practical and epistemological aspects of the sample size adequacy-saturation conundrum. Questions emerge as to the universal applicability of the concept of saturation, its relevance and appropriateness from the angle of how it is traditionally defined, or there is a need for the principle to be re-conceptualised for the highly dynamic and new research environment, such as the DQR contexts (Mpofu, 2025). Researchers might need to justify their attainment of saturation based on theoretical adequacy or practical limitations, rather than on the basis of the non-emergence of new insights. This raises questions on sample-size adequacy determination in DQR environments.

Where researchers fail to appropriately manage the challenges associated with these essential and interconnected concepts of sample size adequacy and saturation in qualitative research, this may have implications on the quality and rigor of the research, credibility of findings, and saturation (under-saturation or pseudo saturation and over-saturation,). Under-saturation or pseudo saturation describes the process where the researcher stops data collection prematurely due to a false sense of saturation (Mpofu, 2025; Peters, 2023), consequently resulting in the research quality being compromised. Critical dimensions, views, patterns, and complexities may be overlooked, and findings being incomplete (not fully reflective of the phenomenon being studied). This compromises the very qualities that foster rigour in qualitative research, such as completeness, credibility, trustworthiness, and saturation.

Over-saturation relates to the point where data has been excessively collected beyond the point where no new information and insights emerge. The over-collection of data has negative implications for financial and time resources, as well as ethical implications. For example, resources may be wasted without value addition to the research process and the findings, hence, this might compromise the efficiency of the research (Mpofu, 2025; Rahimi, 2022). From an ethical perspective, oversampling can also burden participants unnecessarily. Yang et al. (2022) suggest that a little oversampling beyond the saturation point may be necessary to judge whether saturation has been truly attained. Ensuring the balance between sampling, ethical data collection, and conducting research that is both rigorous and efficient is vital.

While contributing to the sample size-saturation conundrum debate, Wutich et al. (2024), suggest sample size guidelines for five different forms of saturation. For theoretical saturation, the researchers propose between 20 and 30 interviews, thematic saturation (4 focus groups; 9 interviews), "metatheme saturation (20-40+interviews, and saturation in salience (10 exhaustive free lists)" (Wutich et al., 2024). Concerning ethnography, 20-30 interviews or 50-81 documents were considered adequate. The

researchers further suggest that for determining sample sizes to reach saturation, two methods must be employed, and these are the statistical power analysis (focusing on content analysis) and the information power (focusing on qualitative content analysis.

2.3 Factors Influencing Sample Size Adequacy and Saturation Attainment

The nexus between sample size estimation in qualitative research and the attainment of saturation is influenced by an array of factors, which include the aim of the study, research questions, and objectives of the research, as well as the philosophical, ontological, epistemological, and methodological (POEM) assumptions of the study. These factors also encompass the diversity or homogeneity of participants, the theoretical framework employed in the study, the researcher's skills and expertise, as well as the availability of resources (Mwita, 2022). Sebele-Mpofu (2020). Saunders et al. (2018), and Rahimi (2024) share similar views on the context-dependent nature of saturation. Hennink et al. (2019) point to the purpose of the study, the mode and degree of saturation to be achieved, the types of codes, stratification of the group, and the number of groups per stratum influence saturation in FGDs studies. Yan and Zhang (2022) contend that (1) sample sizes that are adequate for reaching saturation are influenced by the research process and cannot be set out in advance and (2) a little over sampling may be necessary, considering saturation attainment is fraught with uncertainty as the concept cannot be estimated with accuracy but remains a matter of judgement. Vasileiou et al. (2018) posit that sample sizes in qualitative research are influenced by theoretical, methodological, epistemological, and practical considerations. It is evident that there is flexibility in sample size estimation in qualitative inquiry depending on various factors (Nasheeda, 2022). Morse (2015) adds that saturation is influenced by sampling, sample size adequacy (large enough for replication and participants must be experts in the field under investigation), as well as the researcher's skills, experience, knowledge, and sensitivity. Gandy (2024) points to the sampling strategy, questions used, and the skills of the facilitator in focus groups as key factors influencing the generation of valuable insights from the data. Therefore, understanding the complex interplay of the various factors and, in some cases, their interconnectedness is pivotal in informing methodological decisions involving sample sizes and saturation, as well as the clear justification of how saturation was achieved. Table 2 presents a summary of some of the factors that influence the sample size selection adequacy-saturation interplay.

2.3.1 Purpose and Scope of the Study

The purpose, objectives, and scope of the study influence the sample size and saturation considerations (Mwita, 2022; Sebele-Mpofu, 2021). While exploratory studies might benefit from smaller and more focused samples as they aim for deeper understanding of the phenomenon supported by the gathering of richer data and saturation may be achieved much faster, studies that have a wider scope such as descriptive studies typically depend on larger samples that foster broad coverage of the issue being investigated and saturation may take longer to reach.

2.3.2 Diversity or Homogeneity of the Population

The heterogeneity or uniformity of the target population is a critical factor in shaping sample size determination (Malterud et al., 2016). The reduced variability of participants' experiences and views facilitates the attainment of saturation much quicker, even more so if the selected sample is purposively sampled based on the "information power" criteria explained by Malterud et al. (2016, 2021). More heterogeneous populations require larger sample sizes to capture the diverse views and to ensure enough representation of the various demographic factors. To fully incorporate the wide range of participants' experiences and perspectives requires more data to pinpoint the recurrence of themes, insights, and patterns, as well as to ensure a comprehensive understanding of the phenomenon being researched. Contrarily, homogeneous samples require a smaller number of participants as the inclusion criteria are conventionally narrowly defined.

2.3.3 Theoretical Framework Adopted to Guide the Study

Whether a researcher adopted an established theoretical framework or they adopt a relatively new one and/or seek to develop a new theory is likely to influence sample size estimation (Vasileiou et al., 2018). Adopting established theories might lead to the use of smaller samples, as the researcher harnesses already existing structures, data collection, and analysis lenses set out by previous researchers who employed the theoretical framework in similar studies, research designs, or settings. The pre-existing theoretical direction not only provides insightful guidance for sample size selection and adequacy decisions, but also increases efficiency and the likelihood of attaining saturation quicker.

2.3.4 Researcher's Expertise, Skills, Experience, and Knowledge

The expertise, experiences, and skills of the researcher are fundamental factors shaping the achievement of saturation (Gandy, 2024). The ability of experienced researchers to adeptly probe in-depth and elicit rich and comprehensive data may support the attainment of saturation with fewer participants in comparison to situations where researchers are inexperienced (Mpofu, 2021; Mwita, 2022). A well-guided dialogue during data collection yields more detailed information in contrast to where the interviewer or facilitator is not able to focus and control the engagement. In such cases, with a novice researcher, larger samples may be needed. Therefore, what is important is not the number of cases or participants per se, but what the researcher does with the participants. Additionally, what is important is not the length of the interaction but the quality of the engagement or discussions. Hence, the quality of data collection is crucial for the attainment of saturation and the sample sizes needed, yet the quality of the dialogue depends on the qualities of the researcher, such as experience, ability to create rapport, probe, and seek clarifications.

2.3.5 Availability of Resources

Practical considerations, such as the availability of resources, including time, financial, and human capital, significantly influence sample size decisions. While large samples generally require a bigger budget, more time, and personnel to ensure adequate data collection, addressing the diverse dimensions offered by participants and associated depth and complexity in data analysis, smaller samples may require fewer resources (Mwita, 2022). Furthermore, where researchers have tight deadlines or shorter time available to complete the study, they can compromise data collection and, in pursuit of meeting the deadline, stop data collection prematurely, resulting in under-saturation and weak or incomplete findings. Conversely, where researchers have ample time and large budgets, the temptation of over-sampling and over-saturation is high, raising ethical concerns of wasting resources and burdening participants unduly (Mpofu, 2025; Rahimi, 2024). Therefore, taking into cognisance the practical considerations concerning the research budget, allocated time, and personnel required, researchers need to ensure a balance between the scope and depth (desire to collect comprehensive and deep insights) of the studies when determining sample sizes. In addition, methodological decisions that also influence saturation attainment are also shaped by the availability of resources to support the choices.

Table 2: Factors Influencing the Sample-Size Selection and Saturation Interplay in Qualitative Research

Factor Affecting Sample size Determination and Saturation	Articulation	References
Scope of the Study(aim, objectives and research questions)	Where the scope of the study is broad, analytical generalisations will need larger samples as opposed to studies with a narrow scope which will generally require smaller focused samples	Mwita, 2022; Rahimi & Khatooni, 2024;Vasileiou et al. (2018)
Diversity/Homogeneity of Participants	Homogeneous samples allow for saturation quicker than heterogeneous participants which will generally require larger samples to capture the different viewpoints	Mpofu, 2021; Mwita, 2022
Theoretical Framework Adopted	Leveraging established theories and conceptual models can support selection of smaller samples, where the information from previous studies reviewed support the initial sample size estimations. On the contrary, applying less developed theories or developing new theories from the start is likely to require larger samples to capture different perspectives of the phenomenon being investigated	Sebele-Mpofu, 2020; Vasileiou et al., 2018
Researcher's Expertise	The experience, expertise and knowledge of the researcher influence the quality of data collection. Experienced researchers are more likely to collect richer data, keep the dialogue focused, elicit for elaboration and clarification where necessary and easily create rapport with participants. Conversely, dealing with the complexities of data collection for example through interviews may be difficult for novice or early researchers	Gandy, 2024; Mwita, 2022
Methodological Approach Employed	Different methodologies have different (inherent) sample size norms and varying criteria for judging the reaching of the saturation point influenced by research objectives, scope and POEM assumptions. For example phenomenology, 5-25 participants are arguably enough to attain saturation, while for grounded theory, 20-60participants are observed to be enough for theory development.	Saunders et al., 2018;Sebele-Mpofu, 2020; Vasileiou et al., 2018
Availability of Resources	Resource constraints (financial, time and human) may force researchers to select smaller samples even in descriptive studies that may require larger samples unlike exploratory studies. Larger samples generally require more in terms of time, budget and personnel. Tight deadlines for research projects that are underfunded may necessitate the selection of smaller samples that might take time for saturation point to be attained depending on the heterogeneity and informational power of participants as well as the scope of the project among other issues	Mpofu, 2025; Morse, 2015
Information power of the sample	Knowledge, expertise and experience of the participants in the context of the study	Malterud, 2016, 2021

Source: Author's Compilation

From the discussion in this section and the summary in Table 2, it is evident that the determination of sample sizes and the achievement of saturation are shaped by an array of interconnected issues. No single determinant influences saturation attainment or sample size determination in isolation; instead, the various factors form an intricate ecosystem that requires careful consideration and a balancing act, with adjustments where necessary as the interplay occurs. Therefore, as argued by Sebele-Mpofu (2020), there is no "one-size-fits-all" numerical threshold for sample sizes or saturation for qualitative research. A context-sensitive approach for each study is critical, taking into cognisance methodological choices and justification, guidelines on sample size adequacy, resource availability or limitation, breadth and depth of the study, theoretical framework, as well as the factors associated with the researcher. The next section discusses the review methodology adopted and the guiding research questions to explore the dilemma as it concerns the DQR landscape.

3. Review Methodology

While DQR has modified data collection and analysis, with opportunities and challenges of DQR explored by researchers such as Ntsobi et al. (2024), Bryda and Costa (2023), Pope and Costa (2023), as well as Magida (2024), the relationship between sample size determination and saturation in DQR remains underexplored and unclear. Through a systematic literature review, guided by the PRISMA review protocol, this paper focused on the sample size adequacy-saturation dilemma in DQR. The objective of the paper is to define and explain the core concepts of sample size adequacy and saturation, showing their applicability and identifying key perspectives concerning their interplay in qualitative research. Secondly, the paper identified and analysed existing scholarly literature, guidelines, and frameworks that discuss the sample size determination and saturation dilemma within the context of DQR. Thirdly, the paper synthesised literature on the opportunities and challenges linked to DQR, such as accessibility of participants, diversity of participants, authenticity of engagements, and ethical considerations, and how these factors influence the sample size adequacy-saturation dilemma. The review enabled the researcher to identify gaps and suggest possible ways of mitigating the sample size adequacy-saturation conundrum in DQR.

To identify articles for the review, databases that include Google Scholar, Scopus, and Web of Science were searched using keywords and search terms. The search words and phrases include "the sample size saturation dilemma or controversy in qualitative research", adequate sample sizes in qualitative research", "saturation in qualitative research", "digital qualitative research and adequate sample sizes", "the sample size saturation conundrum in digital qualitative research, "opportunities and challenges of digital qualitative research and sampling", "the influence of digital qualitative research contexts on sample size adequacy and saturation". The search strategy yielded 312 articles, inclusive of book chapters. The titles and abstracts of the identified articles were reviewed as part of the initial screening. As part of the inclusion criteria, peer-reviewed journal articles and book chapters that were in English were included, and these should have focused on saturation and sampling in qualitative research and on the opportunities and challenges of digital qualitative research concerning saturation. The initial screening yielded 118 relevant articles and the researchers further screened these basing on the accessibility of full texts and relevance focusing on the definitions of the two key concepts (sample size adequacy and saturation), challenges and opportunities in DQR and how these interact with the sample size adequacy-saturation dilemma and recency (2015 to 2025). Seminal works such as Glaser and Straus (1967), Guest (2006), and Morse (2015) were included as the foundational works on the concept of saturation. The second screening process excluded 66 articles, leaving 52 articles that were included in the review.

4. Presentation and Discussion of Findings

This section presents findings on the sample size adequacy-saturation conundrum in DQR, the factors affecting this dilemma, as well as the possible strategies to address the dilemma.

4.1 Digital Qualitative Research Dimensions and the Saturation Controversy

The sample-size adequacy saturation dilemma is more pronounced in DQR settings. DiStefano and Yang (2024) explain that even though there are methodological advances in saturation, guidelines for estimating it in more complex designs, such as ethnographic studies, are lacking. Bryda and Costa (2023) explain that the expansion in digital-driven methodologies such as netnography, digital ethnography, and social media analysis heightens the complexities in DQR.

The digital age is characterised by large volumes of data for both business and society in general ("datafication") (Brieter & Hepp, 2018; Lane & Rivera, 2025). Digital transformation across all spheres of society has broadened not only the volume of data but also its variety and volume. This has widened the use of digital platforms and the use of digital tools in research, especially in qualitative research, thus increasing DQR, which was generally fast-tracked by the COVID-19 pandemic. Lockdown and interaction restrictions accelerated the adoption of virtual methods of data collection. While digital transformation in qualitative research presents several advantages for addressing the sample-size adequacy-saturation dilemma, it also further complicates this conundrum. For example, the increased volume of data in digital environments (digital content saturation) presents difficulties for researchers to sift through the information and separate important information from trivial one as advocated by Braun and Clarke (2006). This makes it problematic for the attainment of the point of saturation, as it becomes largely challenging for any one single pattern, theme or insight to stand out, thus raising concerns for the traditional view of saturation as the point of "data redundancy", where "no new insights, themes or information" emerges. While it is less complex and possible to judge the achievement of saturation with iterative human analysis in traditional qualitative research, with a finite and manageable sample, it becomes increasingly complex to do the same with the large volumes of data associated with digital contexts such as social media analysis. This growing dilemma challenges the traditional notions of assessing the point of saturation, suggesting the need for researchers to adopt new analytical frameworks (Mpofu, 2025).

This compels the importance of re-examination of the saturation point in DQR and the adequate sample size controversy. Researchers might find themselves compromising on the achievement of saturation, reaching code saturation over meaning saturation, whereby they identify all the topics discussed under the codes or themes, but without completely comprehending the complexities and different dimensions reflecting a deeper and fuller understanding of the phenomenon. This points to the saturation problem transitioning from the angle of the scarcity or incomplete data in traditional qualitative research contexts to the challenge of abundance (overwhelming data) in DQR.

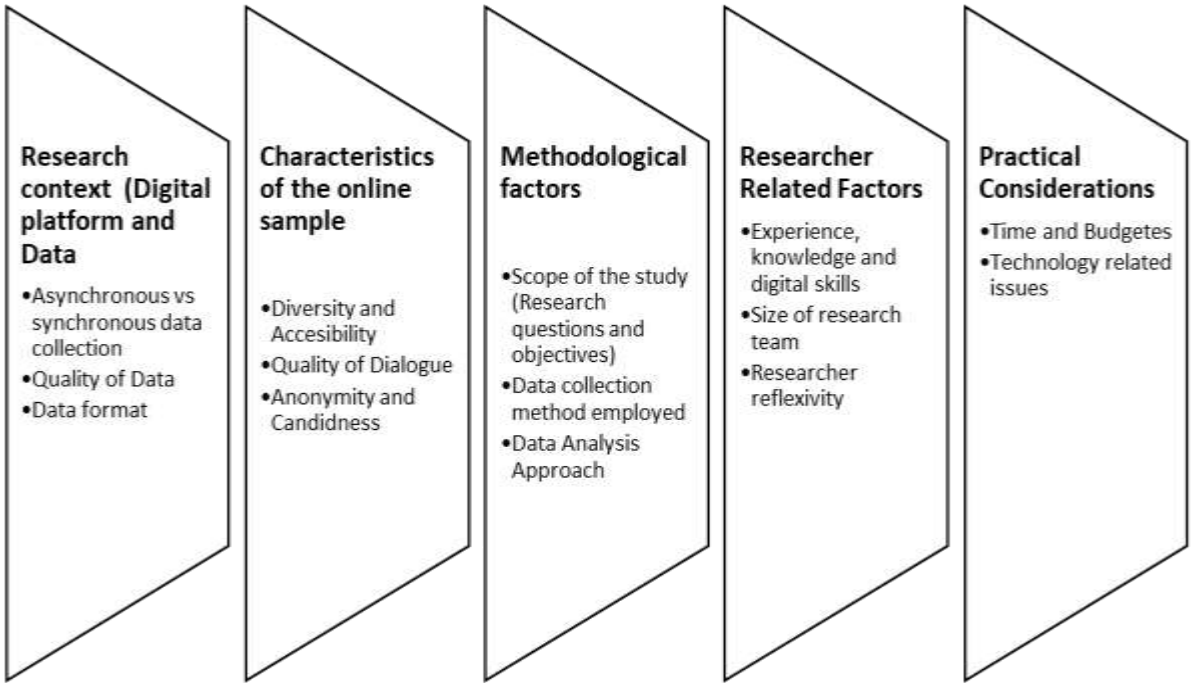
The challenges and opportunities for resolving the sample size adequacy-saturation dilemma can be discussed under the different DQR methods, such as phenomenology, social media analysis, digital ethnography, grounded theory, case studies, interviews, and focus group discussion groups (FDGs). For example, DiStefano and Yang (2024) suggest three methods of assessing saturation in ethnographic studies, and these include "a priori sample size prediction, provisional saturation estimation during data collection, and post hoc confirmation. The researchers argue that they reached saturation before they completed fieldwork. Using 109 interviews and direct observations, they attained 80% saturation at 63% of the full sample (69th data collection event, while 90% saturation was achieved at 83% of the sample (91st data collection event). It is critical to account for the complexities associated with ethnographic

research, such as the wide scope, heterogeneous populations, analysis from diverse qualitative data sources, and broad foci. Focusing on web-based data gathering, Squire et al. (2024) revealed that while the five studies employed sample sizes of between 30 and 70 interviews, true saturation was attained around 30 to 67 interviews (91% to 100% of the sample), and near saturation was achieved at between 15 to 23 interviews. The researchers also pointed out the structure and type of interview guides and questions used, the type of data analysis, and how knowledgeable the population is, collectively influencing saturation attainment in web-based interviews. Therefore, sample size estimation and saturation in DQR are intricate concepts that need to evolve to reflect the complexities of digital environments.

4.2 Factors Affecting the Sample Size Adequacy-Saturation Conundrum in DQR

From Section Two of the literature review, it is evident that the sample size adequacy-saturation dilemma in qualitative research emerges due to three main reasons. These include: (1) the difficulty in determination of saturation a priori since saturation is a product of data collection and analysis, hence it cannot be judged a priori (2) the controversial nature of saturation, lack of clear definition, subjective nature, context dependence and varied forms of saturation, thus implying subjectivity in judgement and interpretation (3) pressure to pre-determine or estimate samples a priori by funding bodies conflicts with emergent nature of saturation which aligns with sample size determination during data collection and analysis. While the factors identified in Table 2 continue to be relevant even in DQR, how some of the factors uniquely influence the dilemma in the digital contexts is summarised below. Guiding the discussion, the factors are summarised into five groups as presented in Figure 1. The insights in Figure 1 are used to guide the discussion on these factors.

Figure 1: Factors Influencing the Sample Size Adequacy-Saturation Dilemma in DQR



Source: Author's Compilation

4.2.1 Research Context

Firstly, the digital platforms and tools allow researchers to gather data both synchronously (in real time) and asynchronously. Real-time interviews and FDGs generally resemble in-person interactions (only this time these are done virtually), making the assessment of saturation almost similar, but bearing in mind the opportunities and complexities associated with digital environments. These are likely to introduce different dynamics to the saturation-sample size dilemma, for example the impact of impostor participants, the digital divide, connectivity challenges and cyberbullying. Asynchronous methods of data collection, such as social media analysis, online platforms, and discussion boards, generate data differently from real-time interactions. Generally, these provide large volumes of data and in some cases spread over time, which can add complexities to the saturation controversy, raising questions on when to cease data collection or when no new information is emerging.

Secondly, the quality of data in DQR might vary in depth and richness. While in some cases interviews and focus groups can yield rich data with smaller samples, this is influenced by several factors such as the creation of rapport, authenticity of participants, quality of the engagement, the digital infrastructure, digital skills of researchers and participants and the "information power" of the sample among other areas (Costa, 2023; Malterud et al., 2016 Mpofu, 2025; Sackett, 2024). Therefore, in some cases, these same factors might compromise the quality of the data collected, increasing the need for larger samples to attain saturation. Sackett (2024) refers to the problems of creating rapport in DQR. Therefore, in some instances, while in-depth virtual interviews offer participants an opportunity to give detailed interviews and might require smaller samples, holding other factors constant, short comments from social media may offer less comprehensive insights, hence needing larger samples and longer time to reach saturation. On the contrary, Thunberg and Arnell (2022) point out that in a sensitive context, DQR methods can help elicit rich data due to the anonymity offered by virtual contexts, but it must also be highlighted that the lack of proximity and closeness offer by in-person interactions may compromise the building of trust that is necessary to create rapport between interviewer and participants.

The format of the digital data also influences saturation attainment in DQR. For example, while it might take longer to transcribe, analyse, and interpret data from virtual interviews, potentially extending the time to achieve saturation, data from chats and online posts may be coded and thematically analysed much quicker.

4.2.2 Sample Characteristics

The diversity and accessibility of participants in DQR influence sample size determination and the attainment of the saturation point. While the use of digital tools has reduced the impact of geographical barriers, increasing the accessibility for the difficult-to reach groups, the more the diverse the samples (Bryda & Costa, 2023; Costa, 2023; Nstobi et al., 2024), the richer the insights and the attainment of saturation may also take time as diverging perspectives continue to emerge during data collection (Mpofu, 2025). Additionally, issues such as the digital divide and digital infrastructure inequities continue to influence sample selection in DQR (as some of the samples might exclude certain groups such as those in marginalised communities, thus affecting sample representativeness and completeness of findings.

Furthermore, the quality of dialogue or interaction during the data collection is shaped by the digital skills of the participants, their participation, and commitment. While it is easier to keep the discussion focused and interactive during face-to-face interactions, it is generally difficult to do so with online participants who sometimes get distracted or disengaged. This affects the quality and depth of data gathered, potentially necessitating bigger sample sizes and extending the time taken to attain saturation. The quality of the engagement is generally also influenced by participants' assessment of ethical considerations, for example, the level of anonymity perceived to be offered by the digital platforms used might affect participants' willingness to give candid responses, thus influencing both the quality of data, sample sizes, and the achievement of saturation.

4.2.3 Methodological Factors

Methodological choices concerning the scope of the study, data gathering methods, and how data is analysed all combine to shape the sample size and data adequacy in DQR. As explained in Section 2, studies with a broad scope may require large samples and take more time to reach the point of saturation. Digital contexts may allow for broader exploration due to the enhanced accessibility to diverse participants across different geographical spaces and backgrounds, thus complicating saturation attainment (Pope & Costa, 2023; Mpofu, 2025), due to both increased samples and diversity of opinions.

The methods of data collection employed also affect the sample size and saturation achievement. For example, while the number of participants to reach saturation for face-to-face interactions through interviews and FDGs might be applicable to digital contexts suggested by researchers such as Hennink et al. (2017, 2019) and Guest et al. (2020), their applicability remains questionable due to digital factors such as digital literacy, digital infrastructure, the quality of connectivity, and online distractions. Netnography or digital ethnography, which is concerned with observation and analysis, is associated with a large volume of data, complicating both data analysis and saturation as these two become ongoing processes. It might be difficult to identify when no new themes or information are emerging. Additionally, in cases where participants provide self-recorded audio or photos, researchers have no control over the data collection, introducing challenges and biases of staged data, as the opportunities for capturing contextual cues during the data collection process are lost. While digital tools can be used, human interaction remains vital in judging the achievement of saturation. This calls for researchers to clearly set and articulate the boundaries for the online community being observed and the type of saturation targeted and attained.

Data analysis approaches adopted (inductive or deductive) shape the type of saturation attained. For example, grounded theory studies are associated with inductive analysis and theoretical saturation, while deductive approach-oriented studies are linked to a priori thematic saturation, where the themes are pre-determined (Sebele-Mpofu, 2020). In this case, saturation might be achieved faster and with smaller samples. It is important to highlight that digital settings and platforms support iterative data collection and analysis, implying a continuous process for the assessment of saturation.

4.2.4 Researcher Related Factors

Factors related to the researcher influence the attainment of saturation as observed by Mwita (2022) and Rahimi (2024), even in digital contexts, these factors play an integral part in shaping the sample size adequacy-saturation conundrum (Mpofu, 2025). For example, researchers who are not only experienced in research or studying the phenomena of interest but also have expertise, skills, and experience in using digital platforms for research are more likely to need smaller samples, gather rich data, and recognise the signs of saturation. In addition, ethical challenges relating to anonymity, informed consent, data privacy, and security increase during DQR, introducing new complexities that may be difficult to navigate even for experienced researchers. Therefore, researchers need to understand these complicated ethical dynamics concerning digital data collection, usage, storage, and sharing, as well as the potential benefits and risks. For example, the use of data analytics, AI, and ML algorithms in research risks perpetuating societal biases, amplifying inequalities, and inequities in society.

Additionally, while digital tools allow for simultaneous data collection and analysis where several researchers are involved, enabling multiple coding and analysis of the data, providing various dimensions, this has both advantages and disadvantages. On the other hand, saturation can be confirmed from different angles, yet reaching consensus amongst the researchers might be a challenge, thus influencing arguments on adequate sample size determination.

Lastly, digital contexts may further complicate the issue of researcher reflexivity in qualitative research. The researcher's theoretical lenses and biases may shape their judgment and interpretation of

saturation, especially more so in digital contexts where rapport and close interaction with participants might be difficult to foster.

4.2.5 Practical Considerations

While some of the advantages attributed to the DQR include the reduction in time and costs associated with traditional qualitative research (Poppe and Costa, 2023), it is critical to point out that where the scope of the study is broad and requires extensive data collection and analysis to facilitate the achievement of saturation, significant time and resources may still be required. Under or oversaturation challenges remain possibilities that need consideration. Investment in digital tools often requires substantial investments, which might compromise the quality of research where both financial and technical resources are limited. Furthermore, proficiency in digital technologies such as AI, machine learning, and qualitative data analysis software affects data analysis, coding, and the identification of themes, and ultimately the assessment of saturation (Mpofu, 2025). The role of technologies such as AI, ML, and data analytics in DQR and their associated ethical implications in research remains a matter of debate among researchers.

5. Discussion of Findings

The review highlighted that as qualitative research evolves in the digital context, the challenges surrounding sample size adequacy and saturation have broadened and new ones have emerged. It was established that while the traditional notions of saturation and information redundancy remain foundational in shaping sample size selection, issues such as participant authenticity, ethical considerations, and data quality complicate the application of these conceptual foundations of saturation in DQR. The research also revealed the need for the reconceptualization of saturation to transition from just considering what is "new" in determining adequate sample sizes to assessing the sample size estimation from the dimensions of conceptual depth criteria and information power. Researchers in the digital landscape need to pay attention to the critical interdependence between ethical rigour, data quality, and the reasonability of saturation claims, as these aspects are fundamentally interlinked in DQR. Data integrity issues, such as the presence of "impostor" participants, compromise the quality and authenticity of data. This is compounded by ethical concerns such as ensuring the anonymity and confidentiality, as well as unauthorised use of online data. These ethical considerations are likely to affect the willingness of participants to provide honest and rich data. If data is collected unethically or compromised by impostor participants, genuinely ascertaining the attainment of saturation, together with when to stop sampling, may be difficult. Hence, the review emphasised that ethical rigour and data quality are not ancillary considerations but fundamental to the attainment of trustworthy saturation and sample size determination in DQR. Therefore, the interconnectedness of these elements points to the need for clear ethical guidelines and digital measures to ensure quality data collection and analysis that support reliable saturation achievement aims in DQR.

6. Conclusions, Limitations, and Recommendations

The sample size adequacy-saturation dilemma remains a major challenge in qualitative research, especially in view of the lack of statistical tools for estimating sample sizes in qualitative research, as is the case in the quantitative approach. While the concept of saturation remains pivotal in both sample size selection and ensuring rigour, it is fraught with controversies concerning the definitional inconsistencies, broadness in applicability (as different forms have emerged as it evolves), lack of transparency in reporting on the concept and lack of clarity in measurement and methodologies among other aspects. All these challenges point to the need for the re-evaluation of the definition or meaning of the saturation concept in DQR, perhaps moving away from exhaustive coverage of themes to gaining adequate insights for answering specific research questions. The digital contexts also introduce new ethical dilemmas (concerning confidentiality, privacy, and informed consent) linked to the use of digital technologies such

as AI and ML, as well as the reconceptualization of publicly accessible digital data into research data. Therefore, to address the sample size adequacy-saturation dilemma, researchers need to adapt their methodologies, ensure adaptive sampling, and iterative data collection and analysis, among other recommendations suggested below.

6.1 Recommendations

To address the sample size-saturation conundrum in DQR, researchers may employ a combination of strategies which include the use of purposive sampling, clear definition of saturation in the context of their study, ensure iterative data collection and analysis, transparency reporting of the methodological journey, justification of choices and the saturation achievement process, together with peer debriefing especially where teams are involved in the research. Factors such as the influence of digital platforms, sample characteristics, researcher-related issues, and theoretical frameworks need to be fully considered and their implications for the dilemma addressed.

- *Purposive Sampling*

Bouncken et al. (2025) emphasise the importance of purposeful sampling in qualitative research in order to get rich information, and Malterud et al (2016, 2021) underscore the need to get information-rich participants. Purposive sampling remains a vital strategy in qualitative research in ensuring both sample size adequacy and the attainment of saturation. Researchers need to select participants meeting certain criteria, such as informational richness. Purposive sampling comes in different ways, such as convenience sampling, theoretical sampling, snowballing, extreme case sampling, maximum variation sampling, as well as confirming and disconfirming sampling. Therefore, understanding these different techniques, their fundamental focus, and applicability is necessary in shaping the sample size-saturation conundrum in DQR. Sampling strategies can be adapted as the data collection progresses and new insights continue to emerge.

- *Explicit definition of the point of saturation to be achieved, and transparently explaining the research journey*

Since the concept has evolved and expanded into around six forms (theoretical, code, a priori thematic, inductive thematic, meaning, and data saturation as presented in Table 1, researchers need to clearly identify the form applicable to their study, define it, and report the methodological journey. Transparency in reporting and documenting the research process (from seeking ethical clearance, sampling, data collection, and analysis) offers an audit trail on how saturation was reached. In trying to make the claims on saturation attainment evidence-based, researchers could use saturation tables, thematic mapping, as well as code frequency counts and code meaning or thematic meaning. Saturation tables can be used to track the emergence of codes and themes across data collection methods such as interviews and focus groups. When code frequencies can assist in counting the regular appearance of a code and the decline frequency in the emergence of new codes. Thematic mapping involves tracking the development and strengthening of main themes through the data collection and analysis process, while code or thematic meaning aligns with meaning saturation. This implies that researchers should not only concern themselves with the emergence and deepening of themes and codes as well as their occurrence frequency, but also their full meanings and dimensions that signify their saturation or complete understanding.

Iterative data collection and analysis

- *Peer Debriefing*

Recognising the complexity of attaining saturation in the digital era and the possibility of varying perspectives emerging where different researchers are involved in the data collection of one study, in addition to member checks, peer-debriefing is a vital strategy to reach consensus, share diverging perspectives, and validate findings.

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