

Editorial

Rigor in qualitative research

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Numerous studies have been published on the rigor of qualitative research, presenting both shared and differing concepts, definitions, and approaches. In this editorial on rigor in qualitative research, the author aims to clarify these concepts by drawing on literature, mainly from Guba (1981) and Lincoln & Guba (1985), as well as his own research experiences, providing examples to illustrate key points.

Our actions are shaped by our beliefs or philosophies. Before conducting social research, we always reflect on the philosophy or underlying nature of our study. A social paradigm based on critical theory or constructivism, which is a set of beliefs used to understand the social world, guides both our actions and our approach to social scientific research (Guba & Lincoln, 1994; Gunbayi & Sorm, 2018). Quantitative opinion surveys typically ask respondents to rate predefined opinions on a scale, whereas the qualitative approach involves eliciting participants' opinions and attitudes in their own words, emphasizing their interpretations, and the shared meanings and symbols within their life experiences. The researcher then analyzes the perspectives of social actors and interprets them to construct a new understanding, acknowledging that knowledge is always incomplete. It is also important to note that, although the qualitative researcher remains objective during the collection of subjective data, the data analysis and theme exploration are influenced by the researcher's values, personal experiences, and worldview. Additionally, the values, experiences, and worldviews of the participants interact with those of the researcher, enriching the depth of the analysis (Gunbayi, 2020a).

Validity and reliability carry distinct meanings across quantitative, qualitative, and mixed methods research. It is essential not only to clarify these differences but also to adhere faithfully to the methodology being employed and to follow the specific principles of validity and reliability required by that approach (Cohen, Mannion & Morrison, 2018).

In qualitative research, "validity" is related to the accuracy of scientific findings and "reliability" is related to the reproducibility of scientific findings. In this direction, the following practices are carried out to increase the validity and reliability of the research. To capture the interpretative nature of qualitative research guided by critical theory or constructivism (Guba & Lincoln, 1994), Guba (1981) and Lincoln & Guba (1985) suggested assessing the trustworthiness of the findings of a qualitative study instead of testing for conventional validity and reliability used in quantitative research. In place of conventional trustworthiness in a research, Guba (1981) suggested "credibility" (in place of internal validity), "transferability" (in place of external validity), "dependability" (in place of reliability), and "confirmability" (in place of objectivity) in qualitative research or naturalist inquiry.

Lincoln and Guba (1985) proposed that four key concerns related to trustworthiness have emerged, and it is these concerns that the criteria must address. The concerns are as follows:

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1. *Truth value*: How can confidence be established in the "truth" of the findings for the specific respondents and context in which the inquiry is conducted?
2. *Applicability*: How can the extent to which the findings may be relevant in other contexts or with different respondents be determined?
3. *Consistency*: How can it be determined whether the findings would be consistently replicated if the inquiry were repeated with the same (or similar) respondents in the same (or similar) context?
4. *Neutrality*: How can it be ensured that the findings stem from the respondents' characteristics and the context, rather than being influenced by the researcher's biases, motivations, interests, or perspectives?

As seen in Table 1, Guba (1981) and Lincoln & Guba (1985) proposed to consider the following criteria as indicators of the rigor of a qualitative study based on above four key concerns: *credibility* for truth value, *transferability* for applicability, *dependability* for consistency, *confirmability* for neutrality and reflexive journals.

Table 1.

Trustworthiness in qualitative research

Aspect	Scientific Term	Naturalistic Term	The quality of findings produced
Truth Value	Internal Validity	Credibility	<u>Contamination-proof (plausible)</u> <ul style="list-style-type: none"> • Prolonged engagement and persistent observation • Triangulation • Negative case analysis • Developing interview form based on related literature • Checking themes and their relations in content analysis via peer debriefing • Member checking: participant confirmation on collected data • Getting the participant to sign a consent form prior to collecting data • Referential adequacy
Applicability	External Validity Generalizability	Transferability	<u>Context-proof (context relevant)</u> <ul style="list-style-type: none"> • Analytic generalization • A purposive sampling method based on voluntarism to get opinions and experiences
Consistency	Reliability	Dependability	<u>Inconsistency proof (investigator-free)</u> <ul style="list-style-type: none"> • Descriptive analysis of collected data • Overlap methods: assurance of consistency of research process with triangulation • Stepwise replication for inter-coder agreement • Calculating Cohen's kappa coefficient to determine inter-rater reliability of themes • Inquiry audit in terms of process
Neutrality	Objectivity	Confirmability	<u>Investigator proof (stable)</u> <ul style="list-style-type: none"> • Keeping all collected data available to prove on demand • Inquiry audit in terms of product
All of the above			<ul style="list-style-type: none"> • Reflexive journals

Source: Adapted from Guba (1981: 80-83); Lincoln & Guba (1985, 328-329); Gunbayi (2019:134-135) Gunbayi (2020b: 8-9)

Credibility

Credibility refers to the extent to which the study findings are credible and support confidence in the “qualitative reality-perspective-based view”. Credibility is one of the most important factors in trustworthiness of qualitative research because it addresses the question: How well do the findings match subjective and inter-subjective worlds?

Guba (1981) proposed certain operational techniques that the naturalist can use to establish credibility: *prolonged engagement and persistent observation, triangulation, negative case analysis, peer debriefing, member checking and consent form.*

In order to increase credibility of the research, *prolonged engagement and persistent observation* are essential as it is assumed that as the researcher becomes a more familiar presence, participants are less likely to behave in ways that are out of character. This familiarity allows the researcher to interact more effectively with the informants, facilitating the discovery and creation of analytical frameworks for understanding and portraying that which is under study due to sufficient intensity and duration and thus researcher perceives and understands the empirical realities of the informants as they do and to show their social world as accurately as possible (Gold, 1997).

Also, if the qualitative design is appropriate, more than one data collection method is used, i.e. individual interview, focus group interview, participatory observation and document analysis and sampling techniques based on purposive sampling such as maximum variation, stake holder, extreme and deviant case samplings. Besides for *negative case analysis* disconfirming and negative case sampling can be utilized, as this strategy involves the researcher seeking out cases that may challenge or contradict their analysis. This approach is valuable for testing theories and recognizing that we often learn the most from our failures (Palys, 2008); in other words, *triangulation* is used in data collection and sampling of participants.

Additionally, while developing the interview form, a conceptual framework related to the subject is created as a result of the relevant literature review. In content analysis, integrity is maintained by verifying the relationships between themes and sub-themes, as well as the connections among all themes, through *peer debriefing*. Furthermore, immediately after data collection, the results and interpretations by researcher are confirmed with the data sources to ensure *participant confirmation* via *member checking*. For instance, participant confirmation is employed to a high degree in a DACUM holistic single case study, a job or occupational analysis method that involves expert workers as panelists. These expert workers can more accurately describe and define their job, tasks, knowledge and skills, behaviors, acronyms, tools, equipment, supplies, materials, and future trends and concerns related to their job using the brainstorming method, than anyone else (Duzguncinar & Gunbayi, 2020).

On the other hand, signing a *consent form* that the information recorded in the interview will be used only for scientific purposes and confidentiality is an important factor in ensuring mutual trust. Thus, the data collected during the interview process is ensured to reflect the real situation, which increases the credibility of the data. Finally, *referential adequacy* is completed when the study results hold up against external material collected during the study so the collection of material such as additional interviews, observations, and documents that will not be used in the immediate data analysis but will be archived for use only after the study is fundamentally completed. According to Guba (1981), referential adequacy requires researcher to involve in additional data collecting during the study with the explicit purpose of checking his or her results against these after the study concluded. This adds an additional point of reference to researcher's findings, which helps to provide trustworthiness to the findings via triangulation of data. Thus, researcher guarantee that his or her interpretations accurately reflect the participants' point of views based on their perspectives in addition to researcher's referential adequacy materials. Referential adequacy is essential to maintain the credibility of qualitative research and to establish trustworthiness.

Transferability

Transferability pertains to the degree to which study findings can be applied to different contexts. Unlike the generalizability of quantitative results, transferability emphasizes identifying similarities and differences through a systematic description of the research context. Therefore, in naturalist inquiry, it is the researcher's duty to offer a comprehensive data foundation that allows potential users to assess the transferability of the findings (Lincoln & Guba, 1985). When the researcher conducts an evaluation based on analytical generalization, they analyze the findings with a focus on the contributions their research makes to the existing body of work. This involves examining how their study aligns with or differs from previous research or scientific books on the subject, considering both the similarities and differences, and determining how their findings add to the understanding of the phenomenon being studied (Gunbayi, 2023).

To enhance the transferability of the research, the research process and its steps are explained in detail. This includes a thorough description of the research model, study group, data collection tools, data collection process, and data analysis. The interpretation is then carried out by applying analytical generalization, where findings are compared with existing studies in the literature and generalized to the relevant theory (Gunbayi, 2023).

In addition, interviews are conducted with the participants on a voluntary basis with the purposive sampling method with appropriate techniques based on *voluntarism* (Lincoln & Guba, 1985; Palys, 2008) in order to reveal the events and phenomena and their varying characteristics.

Dependability

Since there can be no validity without reliability in quantitative research and thus there can be no credibility without dependability in qualitative inquiry, a demonstration of the former is sufficient to establish the latter (Lincoln & Guba, 1985). Dependability refers to the extent to which study findings are consistent and can be replicated. Dependability is essential because it considers the methodological rigor of the study and adherence to a systematic research process in the collection and analysis of data. Thus, in terms of dependability, auditor is expected to examine *the process* of the inquiry. quotation from the transcribed texts.

In order to increase the dependability of the research, all findings are presented directly without comment at the level of descriptive analysis in which it is essential to present verbatim of individual or focus group interview transcribed texts, documents and observations without interpreting with direct quotations (Gunbayi, 2023). In addition, in terms of *stepwise replication* for inter-coder agreement, the researcher and a researcher experienced in qualitative research code the data obtained in the interview separately and the coding is compared by a third person and the reliability rate as *Kappa values* (Landis, & Koch, 1977) are calculated. Thus, it is agreed whether there is a perfect harmony between the evaluators in the research and whether the coding is dependable. To increase research consistency in terms of *overlapping methods*, triangulations such as multiple data collection tools and sampling techniques can be provided, so that findings obtained from different methods can be complemented with each other for instance a finding reached as a result of interviews can be reinforced by the findings that of documents and observations.

Confirmability

Confirmability refers to the degree to which study findings are influenced by participants' perspectives rather than by the researcher's biases. In other words, confirmability assesses how well the data and interpretations are grounded in the collected data itself, rather than in the researcher's personal views (Lincoln & Guba, 1985). It helps evaluate the impartiality and objectivity of the collected data by assessing how well the research findings are supported by the data.

To enhance the confirmability of the research, the researcher provides an external expert with all data collection tools, raw data, coding performed during the analysis, and any notes, writings, and inferences that underlie the report. This process is intended to ensure *consistency* and *reproducibility*. As Lincoln & Guba (1985) noted, “the inquiry auditor also examines the product-the data, findings, interpretations, and recommendations- and confirms that it is supported by data and is internally coherent so that the 'bottom line' may be accepted.”

Reflexive Journals

Researchers should use reflexive journals, as these introspective diaries reveal the investigator's thought processes, philosophical stance, and the rationale behind decisions made during the inquiry. A reflexive journal is a type of diary where the investigator records various details about themselves and their methodology daily or as needed (Lincoln & Guba, 1985). This practice helps the researcher interpret qualitative data from their own perspectives, acknowledging that subjective experiences are an inherent part of qualitative research. Reflexive journals allow for understanding the extent to which the researcher's biases may have influenced the outcomes. Information from reflexive journals is typically included under the title “*Researcher’s Position*” or “*Characteristics*” in the methodology section of research articles.

Samples of rigor based on Guba (1981) and Lincoln and Guba (1985) from the author’s own articles, with direct quotations, illustrate how trustworthiness in qualitative studies-rather than conventional validity and reliability used in quantitative research-is established through credibility, transferability, dependability, confirmability, and the use of reflexive journals in naturalist inquiry.

Table 2.

Samples of rigor for credibility, transferability, dependability, confirmability and reflexive journals

<p>Sample Article 1</p> <p><i>“Ethical Considerations</i> Participants were briefed about the research aims, kept informed at all stages and be offered anonymity. A consent form was signed between researcher and each participant about the use of the data in terms of how its analysis would be reported and disseminated. It was also tried to be careful not to impose researcher’s belief on others and researcher’s beliefs were secondary and the participants thinking be what was required.</p> <p><i>Validity and Reliability</i> In order to ensure reliability and validity of the study, some steps were followed: (i) data were collected from various sources such as interviews (individual and focus group), participant observations and documents in terms of triangulation (ii) data were used as direct quotations from the interviews without making any comments on them, (iii) a purposive sampling method based on voluntarism was used in order to get opinions and experiences of academic staff in Katholieke Hogeshool Leuven (iv) data were coded by two independent researchers and Cohen's kappa coefficient were calculated to determine inter-rater reliability of themes coded - 0.814 perfect agreement- for inner reliability (Landis & Koach, 1977) and (v) records of interviews, documents and participant observations were kept for outer reliability.”(Gunbayi, 2014: 61)</p>
<p>Sample Article 2</p> <p><i>“2.3 Researcher characteristics</i> The research team includes two mental health nurses (AÖ and DK), a Child and Adolescent Psychiatry Specialist (AÖ) and an educational scientist (İG). Interviews were conducted by mental health nurses. Both interviewees have previously published articles on the research topic. In addition, they have acquired the necessary skills and experience in qualitative research during their master's and doctoral education. The selection of adolescents suitable for the study was carried out by a Child and Adolescent Psychiatry Specialist. He made the first contact with the adolescent and their families, gave information about the research and obtained their verbal consent. The last author worked as a qualitative researcher for 20 years, gave various trainings and lectures on this subject and conducted many qualitative research projects. He contributed to the research in the design, analysis and method stages.</p> <p><i>2.7. Rigor</i> In qualitative research, rigor is ensured by credibility, confirmability, transferability and dependability criteria. Credibility and confirmability are related to giving the research process and results in a clear and consistent</p>

manner, being verifiable by other researchers, and presenting it objectively (Cohen et al., 2007; Lincoln & Guba, 1985). Data saturation was determined by transcribing the data after each interview. Triangulation strategy was used in data analysis. Data were coded separately by all authors. Then the codes and themes were discussed in terms of similarities and differences and their final form was given. In addition, an external expert was invited during the data analysis phase to ensure objectivity. Transferability involves providing sufficient information for the reader to evaluate the similarities and differences between the research environment and his/her practice environment (Streubert & Carpenter, 2010). In this study, transferability was ensured by introducing the setting and the participants, choosing the purposive sampling method, determining the inclusion and exclusion criteria, and describing the data in detail. Reliability, on the other hand, depends on whether researchers behave consistently in their research activities from start to finish (Cohen et al., 2007; Gunbayi, 2018; Lincoln & Guba, 1985). All researchers worked collaboratively from start to finish. In addition, this paper provides detailed information about the creation of data collection tools, collection and analysis of data” (Özparlak, Karakaya, Önder, Günbayı, 2023: 735).

Sample Article 3

“3.6. Ethical considerations

Ethical approval was obtained from the university (No: c54313999e4e4788, Date: 16/10/2023). Informed consent was received from all participants before data collection began and anonymity was ensured by using student ID numbers. The use of student ID numbers instead of names also helped avoid possible biases in interpretation. An analyst (IG) who was not directly connected to the participants assisted in this process, allowing the data to be analyzed more objectively. Participants were informed that the questionnaires would not affect their exam grades.

3.7. Rigor

Guba and Lincoln (1985) considered criteria such as credibility, transferability, dependability and confirmability as indicators of the rigour of a qualitative study, capturing its interpretative nature. To increase the credibility of this research, while developing the questionnaire, a conceptual framework was created after reviewing the relevant literature. In content analysis, integrity was ensured by checking the relationships between the themes and sub-themes. Results and comments were confirmed from the data sources. Students’ voluntary participation was also confirmed and the signing of a statement regarding confidentiality and the fact that the information recorded during the meeting would be used only for scientific purposes helped create mutual trust. Thus, it was ensured that the data collected in this study reflected the real situation. To increase the transferability of the study, the research process and its steps were explained in detail. In this context, the model of the research, the study group, the data collection tool, the data collection process, the analysis of the data and the interpretation of the theory via generalization through comparisons with studies in the literature using the analytical generalization method were all addressed in detail. Confirmability depends on whether researchers are neutral in their research activities from the beginning (Cohen et al., 2007; Guba & Lincoln, 1985). In this study, researchers experienced in qualitative research coded the obtained data separately, coding was also done by another person and the results were compared and the reliability rate (kappa value) was calculated. A significant level of agreement was established with a kappa value of .81 (Landis & Coach, 1977). For consistency, all researchers worked in cooperation until the end of the study.

3.3. Researchers’ profile

The research team consisted of two female nurse academics specialized in the Fundamentals of Nursing (G˘O˘O, PhD and NCSC, PhD) and one male educational scientist (IG, Prof.). The nurse researchers had acquired expertise in qualitative research during their master’s and doctoral degrees. They took part in the panel by inviting the participants to the panel, collecting and analyzing the data and as speakers. The last author has twenty years of experience as a qualitative researcher, has given diverse trainings and conferences on the subject and has many qualitative research projects. The author made contributions to the design, analysis and methodology of the research.” (Öz, Çakmak, & Gunbayı, 2024: 2-3).

Conclusion

As can be understood from rigor in qualitative research tried to be explained above, validity and reliability carry distinct meanings for qualitative research and instead of testing for conventional validity and reliability used in quantitative research, trustworthiness of the findings of a qualitative study is essential.

Trustworthiness of the findings of a qualitative study comprises "credibility" (in place of internal validity) for truth value, "transferability" (in place of external validity) for applicability, "dependability"

(in place of reliability) for consistency, and "confirmability" (in place of objectivity) for neutrality and reflexive journals based on author's field notes during data collecting and analysis as well.

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