Decoding qualitative research for Dental Hygiene

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ABSTRACT

The concept of evidence based practice is one that is now well known and applied frequently in oral healthcare. Research in the science based professions has predominantly employed quantitative methods, fuelled by this drive towards evidence based practice in recent decades. Although now used with increasing frequency in dental hygiene, relatively few studies are conducted using qualitative methods. Consequently, familiarity with qualitative research, including its purpose, various approaches and appraisal is limited. This paper therefore attempts to "decode" the qualitative research process and aims to strengthen the readership's understanding of qualitative methodology by providing an introductory description and analysis of its purpose, approaches, and strategies for rigour while contextualizing its value in dental hygiene.

RÉSUMÉ

La notion de la pratique fondée sur des données probantes est aujourd'hui fort bien connue et s'applique fréquemment aux soins de santé buccodentaire. La recherche scientifique fondée sur les professions a surtout utilisé des méthodes quantitatives, avivée par cet élan vers l'exercice fondé sur les données probantes des dernières décennies. Bien qu'elles soient maintenant utilisées plus fréquemment, relativement peu d'études ont recours aux méthodes qualitatives. En conséquence, la familiarité avec la recherche qualitative, y compris son objet, ses diverses approches et son évaluation, est limitée. Cet article tente donc de « décoder » le processus de recherche qualitative et ses buts, visant à renforcer la compréhension par le lectorat de la méthodologie qualitative en lui fournissant une introduction descriptive et une analyse de son objectif, de ses approches et de ses stratégies de rigueur tout, en contextualisant sa valeur en hygiène dentaire.

Key words: dental hygiene, qualitative research, epistemology, grounded theory, phenomenology, ethnography, case studies, purposeful sampling, rigour in qualitative research

INTRODUCTION

As self regulated health professionals, dental hygienists have an obligation to be able to critically appraise and apply the research they read. Most of this research employs quantitative methods. Randomized controlled trials and questionnaire based surveys are the most common research approaches used.[1,2] As a result, the foundational education that many dental hygienists receive focuses on understanding the key concepts of quantitative methodology. However, knowledge produced from qualitative research can play a significant role in a practice that is evidence based. Yet, many are challenged to understand its scientific value. Qualitative research may seem "unscientific" or like common sense, but behind its use lies years of education and practice, rules of evidence, guidelines of approach, and strategies for rigour. Qualitative research begins with a clearly defined question of investigation, identifies the appropriate approach to gather data, and employs a multifaceted strategy to analyze and to interpret the findings. The purpose of this paper is to "decode" or deconstruct the qualitative research process and to contextualize its value in evidence based dental hygiene practice.

The purpose of qualitative research

Qualitative research offers a unique insight into people's experiences and perspectives, providing a comprehensive understanding of their beliefs, attitudes, and behaviours. This approach allows for explorative, descriptive, and interpretative methods in studying human social events with a focus on interactions.[3,4] The qualitative research question explores in great depth the "what," "how," and "why" of social experiences and phenomena rather than investigating "how much" that typically enables generalizations. Quantitative researchers aim to create results that can be analyzed for statistical significance and generalizability to a larger population, whereas qualitative researchers attempt to understand the social aspects and context of an event or interaction.[3] One research methodology is not "better" or more valuable than the other; rather, each method attempts to answer a completely different set of questions. The qualitative approach can therefore help health professionals better appreciate why people behave the way they do, which can be useful when individualizing client care or population interventions.[3,4]

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Qualitative approaches and Methods of data collection

Epistemology

Central to qualitative research is epistemology. Epistemology can be defined as the knowledge a researcher uses to approach the research, as influenced by personal values and world view. Various research approaches and methods of data collection used in qualitative research differ from quantitative research because of a fundamental difference in research perspective. Quantitative research attempts to remove all bias from collection and interpretation of data, while qualitative research acknowledges that bias is inherent and declares it upfront. The researcher reveals personal beliefs and values that may influence the research and its findings, through a description of the underlying epistemology. Epistemologies underpin all qualitative methodologies.[1,5] While methodology refers to the study of methods and various approaches of collecting data, epistemology deals with the philosophical questions of what can be known, who can know it, and through what lens or perspective the researchers approach the investigation.[1,5,6] Exploring epistemology in detail is beyond the scope and intent of this paper; however, one can simply interpret epistemology to be the "science of knowing" and methodology as the "science of finding out."[6] Refer to Table 1 for a definition of epistemology and other common terminologies used in qualitative research.

Once qualitative researchers identify with their epistemological approach and research question, they then choose an appropriate approach to frame the design of their project. As with any study, the design of a research project is based on a clear idea of the question under investigation. That is, the research question informs the research design. Described below are four common approaches used in qualitative research: grounded theory, phenomenology, ethnography, and case studies. Data collection methods commonly used with these approaches involve direct participant engagement or observation or both. While quantitative research aims to summarize data findings through statistics that can be quantified and generalized, qualitative research generally documents these findings through descriptive text. These methods are described and also contextualized within dental hygiene.

Grounded theory

Grounded theory, emerging from Glaser and Strauss in the late 1960s, has become one of the more popular qualitative approaches.[5,7] This approach refers to theory that is inductively developed during a study. Inductive research involves an exploratory method of drawing conclusions based on observations.[5] The original theory developed is "grounded" in the actual data collected, in contrast to theory that is developed conceptually and then simply tested against empirical data. Studies using grounded theory typically involve interviews or focus groups with a moderately sized sample of carefully selected participants.[5,7] Researchers are encouraged to use a constant comparative method of data analysis that involves a rigorous examination of the interview data, coding of transcripts, and thematic development which emphasizes patterns and contrasts across participants.[5–8] Within a dental hygiene context, grounded theory has been used to study adolescents' perceptions of oral health and influencing factors.[9] Factors which were theorized to influence adolescents' perceptions included personal value, socioeconomic status, social support, and peer behaviours.[9] This grounded theory resulted in greater insight into the development of health promotion strategies.[9] More recently, grounded theory has been used to examine the relationship between perceived oral health, body image, and social interactions among institutionalized elders.[10]

Phenomenology

Phenomenology explores the lived experience of a specific phenomenon as well as the results or outcomes of those experiences.[11,12] Study participants are individuals who share a common life experience. Examples may include being an oral cancer survivor, being edentulous, or living with dental phobias. Researchers must acknowledge their biases about the research and make those biases explicit to readers. In addition, they need to set aside their preconceptions about what is real. This practice, known as bracketing, is central to phenomenology and is essential for minimizing researcher bias.[5] Typically, phenomenologists collect data through intensive in depth interviews where they seek to understand the lived experience of the phenomenon under investigation. Data analysis involves extensive coding of interview transcripts in search of quotes and statements that are emblematic in meaning. The resulting data are then clustered into emerging themes which form the architecture of the findings. Phenomenology has been used to better understand the motivating influences, learning experiences, and practice outcomes of dental hygienists who practised with a diploma and then returned to university to complete their dental hygiene baccalaureate degree.[13,14] This research provided insight into the meaning and value of advancing one's education in dental hygiene from self reported lived experiences.

Ethnography

The objective of ethnography is to explore cultural phenomena that reflect the knowledge and systems of a cultural group. Pioneered in the field of anthropology, ethnographical data collection methods intend to capture the social meanings and ordinary activities of people in naturally occurring settings.[5] The goal is to collect data in such a way that does not interrupt the participants nor impose bias on the data. Thus, the trademark approach of ethnography involves participant observation.[5,15] Ethnographical studies involve long periods of time engaging in intense and ongoing observation, taking field notes, and interviewing key informants and are iterative; researchers continuously need to revisit their participants and data.[5,8,15] An example would be a 2008 ethnographic study that examined, through observation and interviews, why Latino children experienced a higher prevalence of caries than did children of any other ethnic group in the United States of America.[16]

Case studies

Case study analysis draws on the ability of the qualitative researcher to extract great depth and meaning in context. This approach involves an intense analysis of an individual case (one person, a group, or an event) or multiple cases stressing developmental or causal factors in relation to a specific context.[5,14] Case studies create a system that is an integrated whole bounded by time and place, known as a bounded system.[8] This approach may employ a number of data collection strategies, including multiple interviews, observation, and document analyses. For example, a case may include a dental hygienist, a dentist, an assistant, and a client to examine their relative roles in oral hygiene care. Another case study may explore the social impact of experiencing a full mouth reconstruction or wearing full mouth orthodontic brackets for the first time. These cases are limited to the context of the dental work and the time during which the case is studied.

Other qualitative approaches

The risk of focusing on only four qualitative approaches in this paper lies in conveying a false message of being limited to these frameworks described above. Qualitative researchers may use other approaches, such as a narrative approach or action research, if that approach aligns more appropriately with their research question. Whereas narrative researchers elicit storytelling or discourse analyses, action researchers dedicate their efforts towards commitment to social change and community empowerment.[5] Researchers may also mix qualitative approaches (fusion or hybrid approach) to achieve the most suitable combination for their needs.[5] For example, a researcher may wish to explore the lived experience of a specific phenomenon (phenomenology) of one client in a specific context in great depth (case study), and may thus use a hybrid phenomenological case study approach. When implemented with experience and discipline, mixing approaches and techniques can bring a new synergy and can serve as complimentary leading to enriching perspectives.

Sampling

The researchers' decision regarding how to sample is driven by the study's research question and goals. As qualitative researchers seek to describe and analyze people's experiences and social interactions in great depth, they generally employ **purposeful sampling**—a deliberate process of selecting participants based on their ability to provide the needed information.[5,7,15] This technique should not be confused with **convenience sampling** which involves selecting participants based solely on their availability.[5,8] Padgett,[5] Maxwell,[7] and Creswell[15] describe various types of purposeful sampling techniques, including:

- **Maximum variation sampling:** attempts to capture the heterogeneity or differences across the sample population in order to generalize the findings within the population being studied (known as "internal generalizability").
- **Homogenous sampling:** attempts to accomplish the opposite of maximum variation sampling by choosing participants who share a common characteristic central to the investigation. An example would be Faust's study which explored the lived experience of being a male dental hygienist in a female dominated profession.[17]
- **Critical case sampling:** selects cases that are the extreme of a situation, such as a dental intervention that aggravated rather than relieved a condition.
- **Snowball sampling:** selects isolated or hidden populations whose members may be difficult to find or to cooperate, such as gang members or drug users or human trafficking victims, commonly explored in social work research.
- **Theoretical sampling:** occurs when inductively derived concepts in a study are used to guide the selection of additional participants.

Table 1. Definitions of common terminology in qualitative research.

Terminology	Definition
Epistemology	Theories of knowledge interpretation and ways of knowing which underpin how research proceeds.
Grounded theory	Theory that is inductively developed during a study and is grounded in the findings of the study.
Phenomenology	Investigating the lived experiences and outcomes of a specific phenomenon.
Ethnography	A systematic description of a cultural group's beliefs and perspectives.
Case study analysis	Extracting great depth in context of an individual case.
Coding	Systematic analysis of transcripts in search of patterns and contrasts leading to thematic development.
Bracketing	Acknowledging and sidelining preconceptions before engaging in research.
Purposeful sampling	Selecting research participants based on their ability to provide the needed information.
Rigour	Strategies used to reduce the potential for bias and enhance the trustworthiness of the research findings.
Data saturation	The point at which no new information or themes emerge.
Triangulation	Collecting information using a variety of sources and methods [at least three].
Member checking	Soliciting feedback from research participants to verify the accuracy and/or interpretation of the researchers' findings.
Negative case analysis	Actively searching for disconfirming evidence and discrepant findings.

Random sampling is a rarely used selection strategy in qualitative research since researchers are interested in understanding specific contexts and phenomena. This range of purposeful sampling techniques may seem foreign or "unscientific" to researchers who are familiar with randomization principles that aim to generalize externally in quantitative methods. Another "unscientific" concept may be the smaller sample sizes that are often sought in qualitative research. However, sample size considerations in qualitative research focus on flexibility and depth rather than on breadth and external generalizability.[5,7,15] The phrase that quantitative research is "a mile wide and an inch deep" and qualitative research is "an inch wide and a mile deep" holds true when sampling.[5] Due to the fundamental focus with depth over breadth, qualitative researchers sample not to maximize breadth or reach but to become saturated with information about a specific topic. Data saturation is a key concept to recognize when appraising qualitative research and is one of many strategies used for scientific rigour.

Validity threats

A key distinction in qualitative research is that the researchers themselves are the tools used in the gathering and analyzing of the data, rather than statistical tests and computer software programs commonly used to analyze the results in quantitative studies. Using human beings as the investigative tool means that qualitative researchers need to ensure they maintain certain strategies of ethics and rigour to ensure their study remains credible and that the results are trustworthy. A key concept for trustworthiness is the validity threat: circumstances that can lead researchers to inaccurate conclusions.[7] Threats to validity in qualitative research fall under three broad headings: reactivity, researcher bias, and respondent bias.[5,7]

- **Reactivity** refers to the potential distorting effects of the researcher's presence on the participants' behaviours and statements. Quantitative research uses distance and controlled conditions to protect against biases; however, the intensity and closeness involved with qualitative research makes participant reactivity a constant concern.
- **Researcher bias** emerges when observations and interpretations are altered by preconceptions of the researcher.
- **Respondent bias** may occur when participants are not completely truthful. Participants may withhold information to protect their privacy or to avoid embarrassment. Conversely, participants may try and be helpful by offering information that they believe the researcher wants to hear rather than what actually occurred.

To minimize these threats to trustworthiness, qualitative researchers implement various strategies within their methods to enhance the scientific rigour of their study.

Strategies for rigour

Rigour refers to vigilance about methods—strategies used to increase the trustworthiness of the research findings. Several strategies for rigour should be used within a study to reduce the potential for bias or misinterpretation and thus increase the trustworthiness of the conclusions. Familiarity with these strategies will enable the reader to appraise qualitative research more comfortably and critically. Strategies for rigour include, but are not limited to, the following:

- **Pilot testing:** Researchers need to anticipate how particular questions actually work in practice, that is, how participants may understand and interpret them. Thus, researchers may pilot test their interview protocol or focus group questions with a small cohort of people who meet the study's inclusion criteria to determine if the questions work as intended before the larger primary study begins. Qualitative research is iterative and reflexive, meaning that researchers commonly revisit and modify their design, particularly if their pilot test does not measure what was originally intended.
- **Data saturation:** Saturation of data refers to the point at which no new additional information is being generated. Saturation refers to completeness. The alternative to saturation—a predetermined endpoint or number of participants—is a poor fit for qualitative research.[5] Using a predetermined endpoint for data collection increases the risk of missing information that may have emerged if more data was gathered. When conducting interviews for example, researchers continue to interview participants until no new data or themes emerge rather than predetermining a set sample size.
- **Triangulation:** Researchers may collect information from three or more sources and methods (e.g., interviews, observations, archival records) that can provide a more comprehensive description and analysis of events. When data collected from multiple methods converge, one has greater confidence that the results are valid.[5,7]
- **Member checking:** Also known as "respondent validation," researchers may seek verification of their findings by soliciting feedback from their study participants. Member checking can be an important step in guarding against researcher bias, by ruling out the possibility of misinterpreting the meaning of what study participants say.[7,18] For example, researchers may provide their participants with a copy of the interview transcript or interpretative summary so the participants can verify that they have been accurately represented.[18]
- **Negative case analysis:** Acknowledging a human cognitive bias towards looking for confirming data that may fit with a researcher's beliefs, negative case analysis involves actively searching for disconfirming evidence and may include consulting with participants on discrepant findings.[5,7] Negative case analysis enhances fairness by giving attention to differing viewpoints and minimizing favouritism or biased interpretations.

This section has highlighted a few key strategies

that qualitative researchers may employ to ensure their methods and results are trustworthy. Moreover, researchers should provide detailed and transparent accounts of these strategies for rigour used throughout the methods in their publications so readers can follow and critically appraise the validity of the findings. Scholarly peer review will serve as the final gatekeeper in determining rigour and trustworthiness. Peer review provides evidence that the study has been externally and impartially judged. Publishing the study then complements the satisfaction of having an answer to a well defined question. Publication is an important process for the dissemination of knowledge alongside translation into an evidence based practice.

CONCLUSION

The purpose of this paper was to provide an introductory description and analysis of the qualitative research process, while also contextualizing its role in dental hygiene through using examples of relevant studies. "Decoding" this process and examining its purpose, various approaches to research design, data collection methods, sampling techniques, and strategies for rigour aimed to strengthen the readership's ability to read, to appraise, and to apply qualitative research more critically. Qualitative research certainly has its role within the dental and social sciences; it need not be considered as less valuable to its more traditional counterpart. The best evidence on social dynamics and factors which influence why clients behave the way they do, regardless of clinical interventions employed, is most often found within qualitative studies.[3] Qualitative research explores people's experiences and perspectives in great depth. The richness of this approach addresses the "what", "how" and "why" of behaviours and interactions. The capacity for qualitative research to explore and to analyze provides ample opportunity to satisfy formally driven curiosity and to contribute to evidence based dental hygiene practice.

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