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Workshop on ‘Developing qualitative research method skills: analysing and applying your results’

The principles and application of qualitative research

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The present paper provides an overview of the methodological principles that underpin qualitative research and how these principles differ from those of quantitative research. It is intended to set the scene for the following papers that outline two specific approaches to the analysis of qualitative data. Within the tradition of qualitative research there are many different theoretical perspectives, of which these approaches are only two examples, but they need to be set within this broader tradition in order to highlight their specific features. Qualitative and quantitative research differ from each other in far more than their methods and data. They are each based on very different premises about both the nature of the world and the nature of our knowledge of it and how this information is generated. These approaches have implications for all aspects of research strategy, including the assessment of the quality of research findings and their wider utility or application. In relation to the latter, lack of detail in the reporting of qualitative research and small sample sizes has tended to create the impression that the findings of qualitative research have little application outside the particular research setting. While there is need for more rigor in reporting, it needs to be recognized that qualitative research can offer insights and understandings with wider relevance, although these outcomes are of a different type from those provided by quantitative research.

Qualitative research: Methodology

It is becoming increasingly accepted within public health and nutrition that qualitative research methods have a contribution to make to understanding the complexity of human behaviour and the interaction between disease and society. There is, however, less understanding of the theoretical principles that underpin qualitative research, and consequently of its appropriate application. The present paper, which addresses these issues, arose from a training workshop jointly organized by the Nutrition Society, the British Dietetic Association and the Health Development Agency. Although the focus of the workshop was on the development of research skills in relation to data analysis, discussion of these issues was prefaced by a brief review of the general methodological principles that inform qualitative research. These principles differ profoundly from those that inform the more dominant tradition of

quantitative research and are largely unfamiliar to those researchers without a background or training in social research. An appreciation of these principles is necessary not only for the understanding and application of different strategies available for data analysis, but also for an understanding of issues relating to the quality or rigor of qualitative research and the application of its findings within the wider world of policy and action. The present paper therefore sets out this wider context for the following papers by Fade (2004) and Rabiee (2004) that describe two particular approaches to the analysis of qualitative data.

What is qualitative research?

Before examining the differing methodological principles that characterize qualitative research and that distinguish it

from quantitative research, it is useful to examine briefly what is meant by these terms. The meaning of the term quantitative is fairly self-evident and refers to the tradition of research dominant in science since the 17th century, with its emphasis on the measurement and quantification of phenomena as essential steps in the process of enquiry. It will be seen that this emphasis on measurement is also linked to a particular set of philosophical assumptions about the nature of the world and how it works, as well as the understanding of it. The quantitative tradition of research encompasses the traditional public health disciplines of epidemiology and statistics, and medicine and biology, as well as nutrition itself. Qualitative research is generally presented as an opposing category to quantitative research, but the term itself, however, is rarely explained; if quantitative research is about quantities, what qualities is qualitative research concerned with? Qualitative research is concerned with the quality or nature of human experiences and what these phenomena mean to individuals. Qualitative research thus tends to start with 'what', 'how' and 'why' type questions rather than 'how much' or 'how many' questions. It is also concerned with examining these questions in the context of everyday life and each individual's meanings and explanations.

Qualitative research can thus be broadly described as interpretative and naturalistic, in that it seeks to understand and explain beliefs and behaviours within the context that they occur. Beyond this definition, however, it is important to point out that within the broad tradition of qualitative research there are a number of theoretical orientations. Many, but not all, these orientations derive from the social sciences, and in particular sociology and anthropology, but qualitative research methods are now being used in a wide range of fields and disciplines. Particular theoretical frameworks or perspectives include ethnography, ethnomethodology, social constructionism, symbolic interactionism, structuralism, post-structuralism, phenomenology, feminism, post-modernism and critical realism. The focus of these approaches ranges from broad philosophical postulates concerning the nature of reality (ontology) and how it comes to be known (epistemology) to narrower theoretical or ideological concerns, such as gender domination. For instance, critical realism, which underpins the interpretive phenomenological analysis described by Fade (2004), is very much concerned with ontology and the practical relevance of the knowledge of reality. It is beyond the scope of the present paper to discuss the features of each of these approaches, but it is important to distinguish between a general methodological commitment to qualitative research and the commitment to specific theoretical or disciplinary frameworks (for a good discussion, see Creswell, 1998). Each of the latter will frame a research question in a particular way and use differing approaches to data collection, analysis and interpretation.

There have been various attempts to classify these different approaches and to identify key themes or assumptions that link them together. Creswell (1998) identifies the key features of qualitative research as 'an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social

or human problem. The research builds a complex, holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting'. To this description can also be added the recognition of the contextual nature of knowledge and action and that these aspects are in large part culturally determined and, in relation to research design, have a flexibility or openness that allows new or unanticipated issues to be explored rather than using a fixed or standardized research protocol (Green & Thorogood, 2004). The contrasts between quantitative and qualitative in relation to particular aspects of their research strategies will be discussed further (p. 643).

The origin and uses of qualitative research

Given that there are a number of different theoretical orientations within the broad tradition of qualitative research, there are various possible starting points that can be identified corresponding to each of these orientations. Having trained originally in anthropology it is being shamelessly partisan to identify Malinowski as a key figure in developing the methodology of qualitative research, and in particular the research technique known as participant-observation. He wrote the following famous statement in the introduction to his ethnography *Argonauts of the Western Pacific* first published in 1922 (Malinowski, 1962): '... the final goal, of which an Ethnographer should never lose sight ... is, briefly, to grasp the native's point of view, his relation to life, to realize *his* vision of *his* world. We have to study man, and we must study what concerns him most intimately, that is the hold which life has on him. In each culture, the values are slightly different; people aspire after different aims, follow different impulses, yearn after a different form of happiness. In each culture, we find different institutions in which man pursues his life-interest, different customs by which he satisfies his aspirations, different codes of law and morality which reward his virtues or punish his defections. To study the institutions, customs, and codes or to study the behaviour and mentality without the subjective desire of feeling by what these people live, of realizing the substance of their happiness is, in my opinion, to miss the greatest reward which we can hope to obtain from the study of man.'

Although some of his language jars today, this description of the goal of qualitative research still holds good and captures its broad aims as applied to health and nutrition research today. These aims can be summarized as: (1) to understand patterns of behaviour and how these patterns may influence and interact with health and nutritional status and health-seeking behaviours, including patterns of food consumption; (2) on this basis, to identify priorities and needs relevant to particular social and cultural contexts and/or groups of individuals; (3) to design and implement interventions that are appropriate to these contexts and/or groups of individuals.

With its emphasis on meaning and understanding, qualitative research can thus complement quantitative research by answering questions that are opaque to quantitative research; for example, in explaining patterns

Table 1. Contrasting aspects of qualitative and quantitative research strategies

	Qualitative	Quantitative
Philosophical basis and research aims	Naturalism and interpretivism To understand social phenomena in their natural settings to produce 'thick description'	Materialism and positivism To test hypotheses and to establish universal laws of cause and effect
Analytical process	Analytical induction	Hypothetico-deductive
Research design	Observational, holistic and flexible	Experimental, reductionist and closed, with variables of interest predefined
Methods and data	Mainly interviews and observations of various kinds yielding textual data	Huge range of specific data collection techniques, but emphasis is on measurement yielding numeric data
Approach to analysis	Codes are derived from the data themselves	Coding frames usually predefined

of behaviour that appear 'irrational' or inexplicable from a biomedical perspective. A famous example is Conrad's (1985) study of why individuals with epilepsy often do not comply with their treatment regimens. Using a qualitative approach Conrad (1985) found that individuals actively manage their illness and use of medication via complex patterns of self-regulation. Their non-compliance, irrational from a medical perspective, could thus be seen as a form of reasoned decision-making and not just a matter of 'disobedience'. In a similar vein, qualitative studies of dietary behaviour and infant feeding practices have shown the complexity of the motivations underlying these issues and the importance of social context (for example, see Nichter & Nichter, 1996 or Hoddinott & Pill, 1999). The studies also demonstrate the importance of understanding these patterns of behaviour for the design and delivery of effective interventions and health services.

Methodological principles

The broad characteristics of quantitative and qualitative research have been described earlier, but they require further elaboration. Table 1 summarizes key differences in relation to six aspects of research strategy.

It should be noted that this summary is crude and that some differences have been sharpened to highlight the contrast between the two research traditions, but it illustrates how the differences between them extend beyond their respective data collection methods and methods of analysis.

Philosophical basis and research aims

Qualitative research is broadly rooted in what has been called the interpretive tradition. The social world is seen as fundamentally different from the physical world and not reducible to it. Human behaviour, it is posited, cannot therefore be explained simply in terms of biological mechanisms. Rather, human action is seen as infused with meaning in terms of intentions, motives, beliefs, social rules and values, and that these factors must be taken into account in both understanding and explaining it. These meanings are seen as socially constructed rather than universal 'givens' and thus contingent on social context. Qualitative research thus aims to describe and explain

social phenomena as they occur in their natural settings. For example, why is it that a particular group of individuals do not use a particular health service or do not eat five portions of fruit and vegetables per d. Anthropologists have called this gaining an insider or emic perspective.

In contrast, the tradition of quantitative research is very much rooted in the materialist and positivist tradition, in that it is concerned with understanding and describing the world in terms of observable physical phenomena, with a focus on the quantitative measurement of these phenomena. Emphasis is placed on the need for objectivity and empirical or 'hard' data, i.e. those data that are directly observable and measurable via the senses. Truth and knowledge are seen to derive from observations of the physical world, and thus to be objective and value-free with universal application. The ideal goal, therefore, is to test hypotheses in order to establish universal laws of cause and effect and, on the basis of these laws, to predict future outcomes; for example, does a high intake of phyto-oestrogens reduce risk of breast cancer?

Analytical process

In terms of the process of how theory or explanations are generated, qualitative research is broadly characterized by the process of analytical induction, in which the researcher moves from observation to generalization, i.e. inferences are made from specific observations to more general rules in order to construct a hypothesis or theory. Grounded theory is a famous example of this mode of reasoning. It was developed by Glaser & Strauss (1967) as a means of systematizing and adding rigor to the process of analysis and the development of theory from data, and it can be combined with different theoretical perspectives, such as critical realism or feminism. Within the broad tradition of qualitative research, rather than collecting information to test a hypothesis, e.g. that individuals do not consume five portions of fruit and vegetables because of lack of knowledge, the explanation should arise from the findings of the research.

In contrast, quantitative research is characterized by the process of deductive reasoning. This process is the other way round, in that theory guides the process of observation and that particular facts are gathered and analysed in order to test a predefined hypothesis. Theory or hypothesis

testing is central to this model of research. Thus, in nutritional epidemiology a study might be designed to test the hypothesis that phyto-oestrogens reduce the risk of breast cancer. Of course, new theories and hypotheses are often suggested by data, so in reality it is often an iterative process and one that combines both types of reasoning.

Study design

The issue of study design tends to be less clearly specified in qualitative research than in quantitative research. In epidemiology, for example, there are clearly defined study designs that are taken to provide stronger or weaker evidence of causal relationships, with the randomized controlled trial generally taken as the 'gold standard'. These study designs clearly specify the approach (observational or intervention), the units of analysis (individuals or groups), how they are to be selected and sampled, the types of measurement to be made and whether these measurements will be cross-sectional or longitudinal. The type of study design has important implications for the mode of analysis and the types of generalization or inference that can be made in interpretation.

Most qualitative research is naturalistic and holistic, in that the focus is generally on studying subjects in naturally-occurring settings, whether these settings are at home or in a particular context, such as an outpatients clinic. It is also open-ended and flexible, in that the research question may be modified as the research progresses and new data collected as new avenues of inquiry are suggested. However, qualitative methods can be used to effect in other study designs, including intervention studies using quasi-experimental designs and even randomized controlled trials. Oakley (1990), for example, famously used in-depth interviews in a randomized controlled trial and advocates their use in the evaluation of complex health interventions.

Methods and data

Qualitative research methods are designed to describe and understand certain patterns of behaviour by accessing the intentions, motives, beliefs, attitudes, rules and values that lie behind them and make actions and behaviour meaningful. There is a wide array of different data collection techniques, but these techniques mostly fall into the categories of interviews and observations of social life, both of which yield textual data. Interviews may be more or less structured and may be conducted on an individual or group basis, such as focus groups. Observations again may be structured or unstructured, participant or non-participant. Participant-observation is the research method pioneered by anthropologists, but it is extremely time-consuming, usually requiring months if not years spent in the field. In the field of applied health research, therefore, interviewing techniques of various kinds are more commonly used.

Within quantitative research certain techniques and methods for collecting data are obviously specific to particular disciplines, such as molecular biology or nutritional epidemiology, but they can be broadly characterized as

being designed to measure variables, thus yielding numerical data on the variables of interest. These variables, which may be classified into exposures and outcomes as in epidemiology, are usually defined in advance and only relevant data are collected.

Approaches to analysis and interpretation

As there are a number of different theoretical orientations or perspectives within qualitative research, so there are also a number of different strategies available for the analysis of qualitative data. Two particular approaches, interpretative phenomenological analysis and framework analysis, are described in detail by Fade (2004) and Rabiee (2004) respectively, so only the general features of these different approaches are described here (for a good discussion of different approaches and their different applications, see Green & Thorogood, 2004). Most approaches follow the broad basic precepts of grounded theory, in that a 'bottom-up' approach is taken in identifying themes within the data and the dimensions of these themes, and developing coding frames and analysing data. In this context, the term 'codes' refers more to conceptual labels or themes than summary groupings of similar values or responses. The aim is to look for themes or concepts that emerge from the data themselves rather than imposing predefined coding categories. The anthropologist Geertz (1973) describes analysis as 'sorting out the structures of signification'. Beyond this description, approaches differ in the techniques used to further develop codes, to examine their inter-relationships and to check the overall rigor of the analysis. The goal is to produce what has been called 'thick description' (Geertz, 1973), in which phenomena are not only described but also located within the structures that give them meaning. To illustrate 'thick description' Geertz (1973) uses the example of what constitutes a blink *v.* a wink. These movements are identical physically, but yet are vastly different; a blink is involuntary and meaningless, but a wink is an intentional act of communication that carries a specific meaning often dependent on the context in which it occurs. A photograph would be unable to capture the difference between the two movements. What is required is a description that also depicts the particular social context and the meanings attributed to winking, *i.e.* 'thick description'.

Beyond this description, in terms of the wider interpretation of the data, the goal is also to offer an explanation of some kind and not just a description; for example, to return to winking, why did someone wink at someone else on a particular occasion? There are different types of explanation of human behaviour (for the identification of five categories of explanatory logic, see Mason, 1996), and these types of explanation differ from the types of 'scientific' explanation offered by quantitative research, which tend to focus on either supporting claims or making causal statements (Miles & Huberman, 1994). A common criticism of qualitative data analysis is that it is very subjective and merely reflects the researcher's own biases and interests. There are, however, various strategies that can be used to enhance the rigor of the analysis and its validity. These strategies will be discussed further (p. 645),

but, as Green & Thorogood (2004) point out, the analysis and interpretations made by researchers should be credible and also transparent, with clear links between the data and any explanations provided.

In quantitative data analysis the variables of interest are usually predefined and specified in the research design. Similarly, the coding frames used to classify and analyse data are also often predefined and relate to external reference points. For example, dietary intake data are often related to standardized dietary reference values to assess adequacy or risk of a particular disease or condition developing. Emphasis is placed on statistical techniques to manipulate data or variables and to determine 'significance' levels. The aim of analysis is usually to relate data back to an initial hypothesis or research question, e.g. is a BMI of certain level associated with increased risk of disease X in a population Y? As noted earlier, the types of explanation produced tend to be of two kinds, causal statements or support of particular claims.

The quality of qualitative research

Quality is a vital issue. Despite the growing recognition of the value of qualitative research, there is still a problem in its reporting that tends to create the impression that is somehow soft and, as mentioned earlier, that its findings express little more than the investigators' subjective impressions. It is, therefore, important to establish the quality and rigor of qualitative research, which is perhaps particularly necessary within applied health research, where the relevance and application of findings outside the particular context of the research setting or population needs to be established. A number of guidelines or strategies to enhance the quality of qualitative research have now been published (for example, see Seale & Silverman, 1997; Fade, 2003), and also guidelines for readers to evaluate qualitative research reports (see Greenhalgh & Taylor, 1997). As Mays & Pope (2000), however, point out it is hard to discuss the issue of 'quality' without touching on theoretical debates about the nature of knowledge and whether the same yardsticks can be used to assess both qualitative and quantitative research. This area is widely contested, with many different theoretical positions within it; to some extent it parallels debates about whether quantitative and qualitative methods can be legitimately combined (Brannen, 1992; Pedersen, 1992). May & Pope (2000) characterize the extremes of this debate as: the ultra relativists who argue that all knowledge is situated and partial and who therefore reject the yardsticks of reliability, validity and generalizability as inapplicable to qualitative research; the naive realists who posit the existence of an independent social reality that is also independently know-able, and therefore differing accounts of this reality can be assessed in terms of their validity or truthfulness. May & Pope (2000) reject both positions as unworkable and adopt what they call a position of 'subtle realism', in which the aim of research is to represent reality rather than attain truth. This approach allows them to suggest that the same criteria can be used for the critical evaluation of both quantitative

and qualitative research, i.e. those of validity and relevance, and they recommend a number of strategies to enhance these factors, such as triangulation and deviant case analysis. This solution is neat and pragmatic, but as Fade (2003) argues, the use of the same terminology is perhaps misleading, as the term 'validity' in particular does carry different meanings when applied to qualitative research. As an alternative, Fade (2003) recommends the slightly different criteria of credibility, criticality, authenticity and integrity.

This debate cannot be resolved here, but what is key is that the issue of rigor must be explicitly addressed in the conduct and presentation of qualitative research, with a clear audit trail provided for readers to allow them to assess the appropriateness of the methods of data collection and analysis, and the rigor of the analysis and interpretation of findings, and thus to evaluate their wider relevance.

The application of findings

From an applied or programmatic point of view lack of generalizability is often seen to be one of the shortcomings of qualitative research, and this is often attributed to the small sample sizes and lack of statistical significance levels. Also, the emphasis on context by researchers themselves mitigates against generalizing on the basis of qualitative research findings. As it does not involve large numbers, however, it does not necessarily mean that it is not possible to generalize from qualitative research. To address this issue constructively it is important to distinguish between different kinds of generalizability, and specifically empirical *v.* theoretical or conceptual generalizability. Following Mason (1996), empirical generalization (and this generalizing is the kind associated with quantitative research) can be taken to refer to the process of drawing inferences from the analysis of one study population about the characteristics of a wider population. It is based on the assumption that the study population is statistically representative of the wider population, and thus linked with the choice of sampling strategy and the determination of sample size needed to achieve this objective. Empirical generalizability is broadly equivalent to external validity and is mostly associated with quantitative research in which inferences or generalizations are drawn about the parent population from which a sample has been drawn.

In contrast, the findings of qualitative research can be used to draw different kinds of inference that are of a theoretical or conceptual nature rather than empirical. This type of theoretical or conceptual generalization is a more complex process and is more concerned with developing concepts, understanding phenomena and theoretical propositions that are relevant to other settings and other groups of individuals. It is also linked with different strategies for sampling, usually theoretical or purposive, that are not seeking to be representative in a statistical sense, but to select units of study (individuals, groups or categories) that are theoretically meaningful and relate back to the original research question (Mason, 1996). As Green (1999)

illustrates in a commentary on a qualitative study of barriers to referral among patients with angina (Gardner & Chapple, 1999), although only sixteen subjects participated in this study a number of issues emerged from interviews, such as fear of hospitals, fatalism and cultural gaps in communication, that would be relevant to other patient groups and other settings.

Conclusion

Quantitative and qualitative research differ from each other from their ontological foundations up. They each produce very different kinds of knowledge and understanding, but can complement each other well, especially in the field of applied health research. Within nutrition and dietetics there is a growing body of qualitative research, and it has much to offer in terms of understanding patterns of behaviour and how particular problems arise, as well as informing the design of interventions or services. It is important, however, that any such research is conducted carefully and addresses the issues described earlier to establish the rigor and utility of findings.

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