

Making Sense of Grounded Theory Approach: Implications for Medical Education Research

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Received: March 2006

Accepted: June 2006

Abstract

This article first gives a definition of grounded theory and its development and use in medicine and medical education. The fundamental differences of grounded theory with quantitative methods are discussed along a full discussion of the steps required to use a grounded theory approach. At the end the questions in the area of medical education which can best addressed with this approach are provided.

Journal of Medical Education Spring2006; 9(1); 17-24

Introduction

In the last 10 years, there has been an increased number of papers published addressing grounded theory” in health care system. Qualitative research, including grounded theory was developed in response to the overwhelming belief held by positivists that qualitative research approaches were unscientific and anecdotal (1). The grounded theory approach, it could be argued, is only one of numerous accepted qualitative research approaches, which has contributed to minimize the debates about the effectiveness of qualitative research within medicine and related disciplines.

Grounded theory was originally developed by Glaser and Strauss as a means to make possible the ‘systematic discovery of theory from the data of social research’. The first article published addressing the issue of this method was in The Discovery of Grounded Theory (2). In earlier times, only phenomena which were controlled through experiments were acceptable by

positivist thinkers. The positivists believed that qualitative research approaches only explore or describe the phenomena under investigation in naturalistic settings such as hospitals or outpatients departments without taking into account any hypothesis or null hypothesis at the beginning of study. As a result of such a philosophy, the grounded theory methodology was developed to endeavor to generate theory.

It is becoming increasingly accepted within medicine that the grounded theory approach provides a systematic way to generate theoretical constructs and/or concepts that illuminate human behaviour and the social world (3). There is, however, less understanding of the theoretical principles that underpin grounded theory, and consequently of its appropriate application. In recent years debates concerning the current status of grounded theory have been rising. May (1996) has been raised questions about diffusion and dilution of the grounded theory (4). Furthermore, issues have been raised concerning the quality of research labeled as grounded theory (4, 5).

Wilson and Hutchinson (6) concluded that the corruptions of the grounded theory in recent years place its trustworthiness at risk, and the

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findings generated are earning a reputation as insignificant or obvious.

On the other side of coin, in 2005, one of the authors conducted a workshop on introduction to qualitative research methods in medical education for academic clinical staff in order to increase faculty members' awareness of how qualitative research approaches have been utilized in health care research and medical education and to utilize this knowledge in their own work settings (7). We realized that most of participants had poor knowledge on qualitative research methods, particularly on the methodology of grounded theory. This could be due to the fact that medical educators across the world have overlooked how qualitative inquiry approaches contribute to medical education's body of substantive knowledge (1). Grounded theory is an extensively applied research approach and makes important contributions to medical education development. This may be attributed to the fact that most theories and hypotheses generated from the grounded theory are empirically testable. Therefore, the purpose of this study was to encourage readers to think how they might possibly use the grounded theory method in medical education research and to apply such a method to their own areas of interest.

What is grounded theory?

Grounded theory is a qualitative inquiry method that looks systematically at qualitative data aiming at the generation of theory that account for a pattern of behaviour that is relevant and problematic for those involved (8). Humans construct theories in order to explain, predict and master phenomena. The theoretical orientation of grounded theory studies is symbolic interactionism, which emphasizes that human conduct is developed through human interactions, through ongoing process of negotiation and renegotiation. Indeed, symbolic interactionism focuses on how people define events and realities and how they behave based on their beliefs (9). Grounded theory is used to explore the social processes that present within human interactions.

Through grounded theory, researchers develop explanations of key social processes that are grounded in empirical data (10).

Unlike quantitative inquiry approaches, grounded theory does not begin with an existing theory but rather generates a specific substantive or formal theory for the phenomena of interest. Glaser and Strauss differentiated substantive theory from formal theory (2) Substantive theory is grounded in data on a specific substantive or empirical area of investigation. It can be a facilitator for formal grounded theory, which involves developing a higher abstract level of theory from a collection of substantive theory studies regarding the phenomenon of interest. Kearney (11) used an analogy to differentiate substantive theory and formal theory. In this analogy, substantive theories assume are like "•custom-tailored clothing" and formal grounded theories assume as "ready-to-wear clothing". Therefore, formal theories (clothes) can fit for a wider variety of users and they are personally not tailored like substantive theories (clothes), but rather provide a conceptualization that applies to a boarder population experiencing a common phenomenon. The formal grounded theories are ideally suited to generation by substantive grounded theory from grounded theory studies. Such theories are essential to develop a scientifically-based practice for all disciplines including medical education. Otherwise, the disciplines need to borrow theoretical assumptions, concepts, and research methods from other disciplines. Therefore, if the medical education profession is to develop scientifically, medical educationalists should debate about generating substantive grounded theories, and gradually shift from the use of borrowed theories and methods to original medical education research.

Features of a grounded theory

Application of grounded theory approaches to inquiry of phenomena important to medical education research, practice, and administration involves several processes. The following is a discussion on important features of a grounded

theory as well as its implications for medical education research.

Research questions

In a grounded theory, inquirers state research questions, not objectives or hypotheses (12). The research question in a grounded theory study is very different to the hypothesis or null hypothesis generated at the beginning of an experimental design quantitative study. Furthermore, the question must be flexible and open-ended to allow the theory to develop. It should be sufficiently broad to enable a systematic enquiry to be conducted of all the aspects of a phenomenon in depth (13). Since the methodology of grounded theory is an emergent design (a design that unfolds in the course of a grounded theory study as the inquirer makes ongoing design decisions reflecting what has already been learned), researchers improve the research question as they generate and analyze the study data. It should be noted that the data generated in a grounded theory may change the study focus study. Therefore, the original question only lends focus to the study. Hutchinson argued that a really precise research question is not possible to pose before beginning any grounded theory study (10). Based upon these arguments, the researchers, therefore, should expect that they will evolve the question over the course of the study.

Sampling

Unlike the quantitative inquirer, the grounded theorist does not decide on the size of the sample population before the study begins. Participants are not recruited on a representative basis, but rather because of their expert knowledge of the phenomenon under enquiry (14). In fact, the researcher selects informants who are experiencing the social process under scrutiny. The sample size is not fixed as in statistical sampling used in quantitative approach; rather, it ideally relies on what Glaser calls 'theoretical sampling' (15). Glaser defined this sampling as "the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyze his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges" (p. 36). Glaser

stressed that the theoretical sampling differs from purposive and selective sampling commonly used in qualitative research. Purposive or selective sampling methods are usually used at the beginning of a qualitative research to recruit informants to provide data about the experiences or phenomena of interest to the inquirer. The research question causes the adoption of who or what is of interest. It is generally accepted that theoretical sampling goes beyond purposive or selective sampling, according to Jeon (16). "Theoretical sampling is driven by the emerging categories and hypotheses, the need for theoretical elaboration, and by the researcher's need to ground developing theory in the empirical data" (p. 252). Jeon has argued that theoretical sampling is an integral part of the constant comparative method of data collection and analysis. It is noteworthy to pay attention to Beker's work revealing common pitfalls in published grounded theory research. She criticised the researchers failed to adhere to the underlying principles of the grounded theory study. For instance, the researchers in published papers used purposive sampling in place of theoretical sampling. (17). Theoretical sampling's endeavour is to discover categories and their properties and to present interrelationships that take place in the substantive theory. 'The basic question in theoretical sampling is: what groups or subgroups do one turn to next in data collection?' (p.36). That is, the selected participants should be determined by the emerging data, and data analysis will offer further participants for further interview. Data collection continues until saturation is reached. That is, exploring further data does not add to, the insight already gained. At this point, the analytical framework is said to be saturated, and further analysis is not necessary. It should be noted that these groups are not recruited before the inquiry begins but only as they are needed for their theoretical relevance for developing further emerging categories.

The collection of empirical data

Data collection usually follows the normal procedures for field research. The grounded theorist will immerse him/herself in the setting

being studied and gather data by such means as participant observation, unstructured interviews, or other written documents or a combination of some methods (13, 15). It has been well documented the need to combine many data collection methods in grounded theory (13, 15). In some disciplines, however, researchers only used interview data for creating their theory (18). The process of data generation requires the researcher to collect, code, and analyze data concurrently. This process allows the researcher to evolve richer data where needed. Indeed, simultaneous collection and analysis of data and emergent theoretical structure help to orient further data collection (13, 15). The choice of data treatment and collection methods is directed mainly by inquirer choice. Researchers usually tape-record interviews and transcribe verbatim and then analyze them using specific procedures, which are discussed below.

Data analysis? Generating theory

Having pointed out that a unique aspect of grounded theory study is that data collection, coding and analysis run concurrently from the beginning of the research. Furthermore, the stated aim grounded theory is discovery of a core variable. Glaser argued that “the researcher undertake the quest for this essential element of theory, which illuminate the main theme of the actors in the setting, and explicates what is going on in the data” (15) (p. 94).

To achieve grounded theory, the researcher should systematically go through steps which have been described by Stern (19). Once sufficient data (maybe one interview is enough) has been collected and transcribed line by line, the researcher should dwell with the data using listening to tapes and re-reading transcripts or field notes until he/she is closely familiar with them in their entirety. Following on, the investigator is ready to move to the next stage of building an indexing system or coding for the data. This allows the researcher to manipulate and analyse the collected data in order to form concepts using a coding scheme.

Concept formation

Coding: At this point, the inquirer read and re-read the transcript line by line, and then conceptualise underlying pattern in the data. Coding occurs at three levels as follows:

Level I Coding: As ground theorists received data, they study the data line by line, and then identifying code words in the manuscript. In level I coding, the codes are called substantive codes (sometimes called in vivo codes) because they codify the substance of the data and use the words of participants (19). Mullen and Reynolds, also, argued that substantive codes may be derived from codes constructed by researchers based on concepts gained from the data (20). At this point, ground theorists try to find as many categories as possible and to compare them with new indicators to uncover features and relationships (20).

Level II Coding: As researcher constantly compare new level I codes with previously identified ones, they condense them into boarder categories. In other words, categories emerge from collapsing level I codes by comparing each level I code with all other level I codes (19, 21). A category is a unit of information composed of events, happenings, and instances (13). Each category is then compared with every other category to make sure that they are mutually exclusive. Level III Coding. This step sometimes called theoretical constructs. They are the most abstract level of codes. These constructs “add scope beyond local meaning”(15) to the emerged theory. At this point, the researcher collapses level II codes in order to aid in identifying constructs, which is led to discovery of the basic social psychological process (BSP). BSPs essentially create the title given to the central themes that emerge from the data. Furthermore, BSPs are process that occur over time and involve changes over time(15).

Concept development

Emerging core variable: Three major steps are involved in the emerging core variable: reduction, selective sampling of the literature, and selective sampling of the data.

Reduction: During data analysis, the researcher may produce an overwhelming number of

categories that need to be collapsed in number. Comparing categories allows researchers to see how they cluster or connect and can be fit under broader category(22). It is similar to clustering items in factor analysis. Category reduction is a vital component in identifying the BPS and core variable. At this point, indeed, the investigator identify theoretical link among the categories and reduces them to form general categories in order to form the core variable.

Selective sampling of the literature: Grounded theory research contrast with quantitative inquiries in that there is no review of the literature in the area of the study before data collection. The rationale for this argument is to avoid biasing the investigators' attempts to develop concepts and ideas from the data that actually fit the data (19). Selective sampling of the literature is recommended and generally follows or takes place concurrently with data analysis. As theory begins to emerge, researchers carry out a literature review to learn what has been published about the emerging concepts (22).

Selective sampling of data: As the main concepts or variables become apparent selective sampling of the data takes place. At this point, researchers may gather further data in a selective manner to evolve the hypotheses and identify the properties of the main variables. Through selective sampling, saturation of categories takes place (22), and then core variable emerges. "The concept of core variable refers to a category which accounts for most of the variation in a pattern of behaviour and which helps to integrate other categories that have been discovered in data" (20). It has been argued that core variable contribute to generating grounded theory, and "the integration and density of theory are dependent on the discovery of a significant core variable"(21). According to Strauss, the core variable has six important features: (a) it repeats frequently in the data, (b) it links various data, (c) Because it is central, it explains much of the variations in all data, (d) it has implications for a more general or formal theory, (e) As it becomes more detailed, the theory moves forward, and (f) it permits maximum variation and analyses (23). Following the emergence of the core variable, researchers

move to concept modification and integration in order to move from a descriptive to a theoretical level. During concept modification and integration, researchers use memos to keep their notions relating to the emerging theory. It should be noted that the experienced analyst produces memos from the beginning of the analysis process until reaching closure. Memos vary in length from one line to several pages. Their purpose is to help the researcher to raise data to a conceptual level, to develop the properties of each category, and to generate hypothesis about interrelationships between the categories (15). The analyst may carry a "Dictaphone" or "Laptop" around with him or her to record these memos.

Application to medical education

Until the 1980s, the positivistic inquiry methods were of standard use to perform medical research, including medical education research. Medical educationists have tended to make the best use of research employed by the fields of social science and education. There are two possible reasons for this. First, this may be due to the fact that the vast majority of medical academic staff members who contribute to medical education knowledge, work at medical schools, but their ideas and thoughts have been rooted in the field of education and social science. Or it might be due to the fact that they have been trained by educationalists (rather than medical educationists) who did not have any medical backgrounds. From this point, it could be argued that such people conduct research which has no implication for medical education, or that they may be choosing an ill-suited approach and hence offering inappropriate research paradigm for medical education. Bligh argued that using other disciplines in research in medical education represents a major strength. However, it also increases the problem of defining medical education research (24). A review (25) revealed that medical education research is frequently small-scale, local, and finds answers to local problems. Further studies have recommended

that although some high quality work has been documented, increased rigour and coherence, especially in relation to theory building, could strengthen the quality and reputation of research in medical education. From these points, it could be argued that research in medical education is not finding its place. A small amount of theoretical and conceptual frameworks within medical education have been led medical educationists to borrow their knowledge from other disciplines, particularly social science and education. According to Bligh (24) "research in medical education is the critical, systematic study of teaching and learning in medicine and includes scholarly analysis of the context, processes and outcomes of all phases of medical education" (p. 162). He argued that findings of research into aspects of medical education, for example, new facts, concepts or ideas, and emerging concepts, have an impact on how medical students and doctors learn, and how they are taught, assessed, and selected, and how their courses are organized, funded and administrated. It seems that medical educationists have overlooked the importance qualitative researchers placed on qualitative inquiry approaches, particularly the use of grounded theory in the profession of medical education, where the ultimate purpose of such a perspective is to construct a coherent theory from the data that is rooted in the reality of human experience and interaction. Generating grounded theories in medical education may lead medical educationists to become self-sufficient with regards to knowledge, and to become engaged in debates concerning the need for and the methods of generating substantive theory and to shift from the use of borrowed knowledge and methods to original medical education research. Such an original knowledge in medical education may improve patient care, as such if substantive theories are generated into teaching and learning in medicine, they will have their impacts at the bedside, in consulting room and in the wider community.

Using grounded theory in medical education. The grounded theory approach has been used in the field of social sciences and nursing as a result

of the ample guidelines that have been developed in order for researchers to attach the qualitative research project to the 'good science model' (26). Although there has been an increasing interest in publishing qualitative research papers in medical education research, mainly research on teaching, research on the curriculum, and evaluation research studies (27), there have been few papers of grounded theory in medical education. It may be argued that other qualitative research traditions, particularly that of, case study and ethnography research have been the approaches of the greatest number of studies in medical education. This may be attributed to the fact that the nature of the questions raised was relevant to such qualitative research methods. However, one might argue that the ongoing process and multistage processes of data analysis, used for creating theory, which make up the activities of the grounded theory may demand from the researcher both sensitivity and time to work out the findings which emerge from the data. Such core activities, particularly, may confuse a novice researcher during the complicated and difficult research process (18). It has been argued that problem areas that involved complex human intentions and motivations occurred in a dynamic context, which needs to be studied using qualitative research study. These areas are: teaching and learning in hospital and ambulatory settings; especially choice and role modeling; evaluations of programs, problem-based learning; and processes of curriculum development. Dealing with grounded theory approaches, there are many other areas in medical education that would benefit from the application of grounded theory approaches, such as the selection processes, professional socialization, curriculum implementation processes; and students' experiences on education, such as lectures, laboratories, and the community (28). Further examples of medical education-related questions that suggest a grounded theory approach as a suitable method include, "By which process are medical students socialized into the profession of medical training?", "In what way do medical students become independent learners?", "In

what way do interactions with medical teachers influence the clinical decision making of medical students?" and "By what process is decision making learned by students in medical training education programs?" To answer the last question, for instance, ground theorists may conduct unstructured interviews related to decision-making processes that medical students have experienced. Students, medical teachers, and course planners may be interviewed and observed in action. The grounded theorist provides a 'thick', rich description of the learning of decision-making processes, and then creates a process model of learning clinical decision making, resulting in a set of propositions explaining the clinical learning decision-making processes. Furthermore, the findings of such a new paradigm are useful in clarifying unique aspects of medical education practice, in providing criticism of the experimental research design, and in creating new hypotheses for future inquiry.

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