

Research approaches for novice nephrology nurse researchers

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Abstract

This theoretical paper provides information on the strengths and weaknesses of both the qualitative, quantitative and mixed methods research approaches and seeks to guide those who wish to engage in the research process. The qualitative research approach is explained and compared with the quantitative approach which allows the novice nephrology nurse researcher to determine which approach will be the most useful in exploring their research question. Three of the most common qualitative research approaches of phenomenology; ethnography and Grounded Theory and their particular features are described, explained and critiqued with examples of contemporary nephrology nursing research studies.

Introduction

The aim of this paper is to inform and guide novice nephrology nurse researchers with an overview and simplified explanation of the features of both qualitative, quantitative and mixed methods nursing research approaches. These approaches may be useful when attempting to answer nephrology nursing research questions. A critique of the three most commonly used qualitative research approaches of phenomenology, ethnography and Grounded Theory are provided as examples that may be used. When using the quantitative approach, novice nephrology nurse researchers need to be familiar with aspects such as randomised controlled trials (RCT's), hypothesis testing and quasi-experimental technique. Examples of contemporary nephrology nursing research relevant to each approach are interwoven throughout the paper that provide a reference point for further independent self directed study.

An Overview of Research Approaches

According to Shih (1998) quantitative research has been the predominant approach in medical research. This approach is based on the assumption that the

objective single "truth" or a relationship can be measured numerically with an emphasis on using analytical or sophisticated statistical data (Jeon 2004; Paley 2005; de Witt & Ploeg 2006; Rolfe 2006). Data collected is described as hard, replicable and reliable (Shih 1998). Quantitative research approaches use the experimental research design where independent variables are manipulated and a decision is made on the dependent variables in a cause and effect relationship (Rapport 2002; Schneider et al. 2005). This approach involves reducing or breaking down the experience of health into parts which are observed from a position of being neutral and objective so as to guard against bias (Paley 2002; Rapport 2002; Darbyshire, Oster & Henning 2005; Rapport & Wainwright 2006).

However, with the transfer of nurse education into the tertiary teaching sector, more nurses are engaging with the research process as a component of their professional nursing practice (Darbyshire 2010). This new generation of nurse researchers has embraced the qualitative research approach to answer their particular research questions. This approach focuses enquiry from the perspective of the individual within the naturalistic setting (Al-Arabi 2006).

Key Words

nursing research, randomized controlled trial, hypothesis testing, phenomenology, ethnography, grounded theory.

The most common method to obtain data in qualitative research is from the oral narrative, which is gained through a direct oral encounter between the researcher and participant (Schneider et al. 2005). Qualitative research approaches aim to select information rich cases based on the assumption that "truth" is expressed within a multiplicity of realities or layers that have been obtained from a written record of the direct encounter between researcher and participant. The language in this text is examined to gain a deep understanding of the action, beliefs and values of a person's interpretation of their world or lived experience (Araujo Sadala 2002; Rapport 2002; Schneider et al. 2005; Rolfe 2006; Munhall 2007). Data collected has been described as rich, deep, real and valid (Shih 1998).

Qualitative Research Approaches

The aim of the qualitative nephrology nurse researcher is to contribute to knowledge that underpins the discipline of nephrology nursing (Schneider et al. 2005). Benzies & Allen (2001) have reported that nurse researchers are challenged when developing nursing practice theory that assists to explain complex experiences that influence human health and well-being. This research approach can provide nurses with deep understanding of how people manage the impact of health issues from a subjective perspective (Van der Zalm & Bergum 2000; Schneider et al. 2005; Rapport & Wainwright 2006).

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Qualitative research rejects the notion of generalisability (Paley 2005), but the findings from qualitative research can inform nursing practice by assisting nurses to anticipate or be sensitive to future significant events for similar people in similar situations (Grbich 1999; Van der Zalm & Bergum 2000; Forsberg et al. 2004). An example of a qualitative study is by Caress, Luker & Owens (2001) that examined the subjective meaning of living with chronic kidney disease. This qualitative study has contributed to nephrology nursing knowledge by creating a 'picture' of how human beings affected by chronic kidney disease, experience that disease. Another example of using a qualitative research approach is a study by Martin-Macdonald (2003) who examined the meanings of dialysis dependency.

The three most useful qualitative research approaches of phenomenology, ethnography and Grounded Theory are described for the benefit of novice nephrology nurse researchers. This description provides a general appreciation of the commonly used approaches and can be helpful in gaining an understanding about the differing ways data are collected, organised, conceptualised, refined, and interpreted (Thorne 2000).

Phenomenology

Nurse researchers have widely embraced phenomenology because of its applicability in providing a snapshot understanding in many areas of health and illness. This qualitative research approach attempts to explain and reveal the subjective experience of chronic illness, health, treatment and care from the perspective of those who provide that care as well as the recipients of care (Paley 2005; Schneider et al. 2005; Berg, Skott & Danielson 2006). The aim for the nurse researcher is to reflect as closely as possible the meanings, beliefs and thoughts of the complex human experiences in an animated way (Van der

Zalm & Bergum 2000; Annells 2006). This research approach does not attempt to identify a causal relationship, but aims to give voice, provide comprehension, illuminate the essence of the lived experience and reveal the taken for granted, unnoticed, hidden, concealed or overlooked meanings within the context of everyday life (Maggs-Rapport 2000; Van der Zalm & Bergum 2000; Paley 2005; Annells 2006; Berg et al. 2006; de Witt & Ploeg 2006). Ravenscroft (2005) justified the use of the phenomenological approach to the study of people with diabetes and kidney failure in that this research approach was an interpretation of their lived experience so as to understand the meanings embedded within the illness experience.

Phenomenology has two variations depending on the positioning of the researcher. One variation which was supported by Husserl, recommended that the researcher's assumptions about the world be suspended so that purely through the participants conscious awareness, the lived experience would be revealed and described (Rapport 2002; Rapport & Wainwright 2006). Nurse researchers who support this objective positioning, 'bracket' their prior knowledge and only seek to see the illness experience from the participant's point of view in an attempt to prevent bias or contamination of the data (Wimpenny & Gass 2000; Barkway 2001; Al-Arabi 2006; Rapport & Wainwright 2006). McCarthy et al. (2009) took this objective position by bracketing their assumptions during data analysis of their phenomenological research project. This study attempted to understand the lived experience of Australian peritoneal dialysis nurses when dealing with compliance issues.

However, Heidegger suggested that the researcher's contribution to the interpretive experience could not be suspended. In the interpretive phenomenological approach, also known as hermeneutic phenomenological interpretation, the

researcher is an active participant in the interpretive process rather than being a passive recipient of knowledge (Maggs-Rapport 2000; Van der Zalm & Bergum 2000; Berg et al. 2006). The viewpoints the researcher brings to the lived experience are examined, explained and incorporated into the research findings (Curtin, Johnson & Schatell 2004; Harwood et al. 2005; Paley 2005; de Witt & Ploeg 2006; Rapport & Wainwright 2006). Importantly, instances where the nurse researcher and the participant's views do not harmonise, and are opposed, need to be explained within the research findings (Annells 2006). Interpretive phenomenological nursing research studies include Meiers & Tomlinson's (2003) examination of the family-nurse co-construction of meaning, Spichiger, Walhagen & Benner's (2005) examination of caring and Tanyi et al's (2006) examination of spirituality in women on haemodialysis.

Consultation of the participants and trust of their viewpoint is a major philosophical underpinning of this qualitative research approach, however to accept uncritically what the participant has provided, when their perception may be mistaken is a weakness of phenomenology (Barkway 2001; Paley 2005). Despite this recognised weakness, this approach would be appropriate in being able to illuminate the hidden aspects of chronic kidney disease (CKD) through the reflections of those people living with this chronic illness.

Ethnography

Ethnographic research techniques involve the researcher physically entering and being intensively immersed in the natural setting to observe the actions and interactions of people within the context of their culture so as to build a picture of their language, rituals and relationships (Maggs-Rapport 2000; Borbasi, Jackson & Wilkes 2005; Roberts 2007).

Analysis of the data that is collected through firsthand experience enables

the researcher to understand social meanings and construct a social account of the participant's routine and/or daily situations (Maggs-Rapport 2000; Bonner & Tolhurst 2002; McGarry 2007). As in phenomenology, the contribution of the nurse researcher to the data analyses differentiates the variation of ethnography. Removing or minimising the researcher's voice was considered important in ethnography to limit biases and create an objective account; however allowing the researcher to participate using a reflexive voice is considered a positive aspect of more recent or postmodern critical ethnographic research (McGarry 2007). Reflexivity is a process of self-awareness and self analysis that clarifies how the researcher's beliefs and values impact on the analysis of the data (Grbich 1999; Schneider et al. 2005; Borbasi et al. 2005). In critical ethnography, the researcher and participant are in an interdependent relationship, in which the tensions arising from different power relationships are explained and analysed through the researcher's reflection (Manias & Street 2001; Borbasi et al. 2005). However, a weakness of this research approach is as Borbasi et al (2005) explains that currently there is no consensus as to which position the nurse researcher should adopt - objective or reflexive.

A further limitation that nurse researchers should be aware of is the level of rapport or intimacy between the nurse ethnographer and the study participants. This can influence the data analysis of the observational periods and nurse ethnographers may need to consider the level of their involvement with the study participants. A study by Bonner and Tolhurst (2002) believed that rapport and trust facilitated the gathering of rich and focused data, within a nephrology setting, as one of the researchers was a nephrology nurse. Other examples of recent Australian ethnographic studies are by Blogg & Hyde (2008) who gained a deeper understanding of the

cultural experiences of spousal caring for people on home haemodialysis and Tranter, Donoghue and Baker (2009) who entered an Australian haemodialysis unit to understand the tensions that haemodialysis nurses experience when delivering nursing care in a highly technological environment. As long as rapport and trust can be established with the participants, the ethnographic research technique is an ideal approach for examining social interactions and relationships of people with CKD and their health care providers.

The advantage is that researchers are able to enter cultural environments at different time points.

Grounded Theory

Grounded Theory is concerned with the development of theory relating to sociological processes, rather than just an explanation of the culture or lived experience. Grounded Theory takes quite a different approach in the investigative research process. Instead of commencing the research project with a research question, Grounded Theory encourages the researcher to begin the research process using an open line of inquiry with general questions to be explored (Glaser & Strauss 1967; Anells 1997; Backman & Kyngas 1999; Wimpenny & Gass 2000; Cutcliffe 2005; Bonner 2007; McGhee, Marland & Atkinson 2007).

Another feature of Grounded Theory is that data collection, data analysis and theory building are concurrent. Morse (1991) explains the research process occurs at the same time with data collection, through the constant comparative analysis (CCA) technique. CCA is fundamental to Grounded Theory, through the systematic consideration of incidents and the creation of concepts and categories leading to analytical theory development (Corbin & Strauss 1990; Kendall 1999; Jeon 2004; Chen & Boore 2009). CCA is accomplished by asking questions, comparing similarities and differences

within the data and theoretically coding new information with concepts previously identified (Stern, Allen & Moxley 1982; Kendall 1999; Chiovitti & Piran 2003; Wuest 2007).

The strength of Grounded Theory within a nephrology nursing context is that this research approach assists nephrology nurses to generate nursing practice theory to answer complex exploratory research questions that consider the processes of why, how, when, under what conditions and with what consequences the social interactions and processes unfold related to the psychosocial organisation of people with CKD (Stern et al. 1982; Anells 1997; Wimpenny & Gass 2000; Eaves 2001; McCallin 2003; Joen 2004; Cutcliffe 2005; Lingard, Albert & Levinson 2008; Chen & Boore 2009). Recent nephrology research studies include decision making for kidney donors (Yi 2003); end of life decision making in haemodialysis patients (Calvin 2004); existential and social ramifications of haemodialysis (Russ, Shim & Kaufman 2005); nephrology nursing expertise (Bonner 2007); spirituality in American Indians on haemodialysis (Walton 2007); stopping dialysis (Russ, Shim & Kaufman 2007); linking political power with kidney health in Egypt (Hamdy 2008); and shared management in childhood chronic kidney disease (Swallow et al. 2009).

Clearly, Grounded Theory would be an appropriate research approach to investigate how people with CKD respond to their changing kidney health status by examining the consequences of their interactions and their decisions in the preservation of kidney health. However, a weakness is the emergence of specific variations, again depending on the researchers' objective or reflexive positioning. These variations could be a major source of confusion to novice nephrology nurse researchers. Those who are considering using Grounded Theory, when undertaking a nephrology nursing research project, are encouraged to read further seminal sources about the

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controversial aspects, such as how the data is handled and analysed to develop a clearer understanding of this complex and yet valuable qualitative research approach (Glaser & Strauss 1967; Kendall 1999; Strauss & Corbin 1990; Strauss & Corbin 1998; Annells 1997; Annells 2006; Mills, Bonner & Francis 2006; Newman 2008).

Quantitative Research Designs

According to the Joanna Briggs Institute (2010), there are four levels of evidence in quantitative research. The strongest evidential research is Level 1 which involves large, prospective, multicentre, double blind, randomised, controlled trials (RCT's). These quantitative studies provide the strongest evidence in a cause and effect relationship where the statistical findings can be generalised to other populations (Schneider et al. 2005; Borbasi et al. 2007; Zuzelo 2007). The lowest level of evidence in quantitative studies is level 4, where the findings are based on expert opinion or anecdotal evidence (Joanna Briggs Institute 2010). Clinically robust quantitative data from multiple, prospective RCT's has supported prescribing warfarin, in all populations including the CKD population, in the prevention of cerebrovascular accidents after a diagnosis of atrial fibrillation (Fishbane & Goldman 2002). This RCT provides clinicians with the confidence to accept the study's findings and apply this evidence to their own patient populations with the same positive outcomes.

Limitations of conducting RCT's are that they are difficult to undertake and complete. Issues that need to be overcome include ensuring adherence to equitable randomisation, management of costs and strict control of study designs (Nagy et al. 2010). An inadequate sample size will result in populations being under-represented and as a consequence the researcher may develop biased or inconclusive findings (Hart 2006). The researcher must overcome the identification and recruitment of sufficient numbers of suitable participants

for large sample sizes from a population in a random pattern where each participant has an equal and independent chance of being selected (Schneider et al. 2005). In an Australian context, the Randomised Evaluation of Normal versus Augmented Level Replacement Therapy (RENAL) trial is comprised of 155 collaborators, with a sample size of 1500 patients examining the optimal dose of renal replacement therapy to be delivered in patients in intensive care units who have developed acute renal failure (Bellomo et al. 2008).

Hypotheses are the beginning points in designing strong quantitative research studies. Statements are made in the form of predicted outcomes or causal effects about a relationship between two or more variables (Meadows 2003; Schneider et al. 2005). A variable is a characteristic of an object or behaviour that may change as a result of an intervention in a research study (Harris, Nagy & Vardaxis 2006). The most common hypothesis is the "null hypothesis" or statistical hypothesis where an assumption is made that there will be *no change* or difference between the variables. If a statistical significance is demonstrated, then the null hypothesis will be rejected (Schneider et al. 2005). A recognised level of statistical significance or the possibility that the research findings are not due to chance is nominated as a "p" value or probability value. By convention, a nominated level of statistical difference is recognized as $p < 0.05$. This "p" value indicates that the findings did not occur naturally but as a result of the research intervention (Dawkins 2006; Nagy et al. 2010, p 108). Peng et al (2005) was able to reject their "null" hypotheses in their study in that there was a statistically significant difference in the ages of women with end stage renal disease (ESRD) between those who reported sexual activity to those who did not. The "p" value for this age difference was $p < 0.001$.

This highly significant "p" value demonstrated that there was a greater

difference between the behaviour of the two groups of women.

Another way in determining a difference or relationship between groups is to select which direction, either positive or negative, that the research findings may lean towards. If the research findings demonstrate a difference in the expected direction, between the nominated variables, then the hypothesis or predicted outcome has been supported (DeVon et al. 2007). An example of a directional hypothesis is provided by Martin et al (2005) in "that overall patient satisfaction with dialysis care would be predictive of subsequent compliance with the haemodialysis regimen" (p13).

Quasi-experimental quantitative research designs attempt to reveal a causal relationship between the variables but this research design does not include randomisation or control groups (Borbasi, Hengstberger-Sims & Jackson 2007). Barnett et al (2008) used a quasi-experimental design to determine the effectiveness of education on improved fluid restriction compliance in a haemodialysis population. The study population consisted of only one group of participants who had fluid assessment measurements both before and after education on fluid restrictions.

One sampling technique that may assist in the recruitment of large numbers of participants is convenience sampling (Nagy et al. 2010). This recruitment method is the easiest way to recruit participants in that any readily accessible person or object that meets the inclusion criteria can be included in the study (Schneider et al. 2005). Dermody and Bennett (2008) used convenience sampling to recruit nephrology nurses in their study on nurse stress in Australian haemodialysis units. However, the results generated from this sampling technique, limit the ability to generalise these findings to a larger population, in that significant individuals or groups are either over or under-represented (Borbasi et al. 2007).

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Novice nephrology nurse researchers, who choose using the quantitative research approach, may need to develop or use a validated questionnaire or scale as the tool or instrument to determine the answer to their research question. A limitation is the use of psychometrically weak tools or instruments. Addressing the reliability and validity of these tools is a requirement for assuring the integrity of a quantitative study's findings (DeVon et al. 2007).

Novice nephrology nurse researchers are directed to Boynton & Greenhalgh (2004); DeVon et al (2007); Duddle & Broughton (2007) for more information on reliability and validity of quantitative instruments.

Mixed Methods

The integration of both quantitative and qualitative research approaches in a single nursing research study is referred to as mixed methods. Novice nephrology nurse researchers may elect to use this type of approach for two reasons. The first is to strengthen the comprehensiveness, reliability and validity of a study and the second is to capture more complete realities or dimensions of the experience being investigated (Schneider et al. 2005; Creswell & Plano Clark 2007; Morse & Niehaus 2007). Darbyshire (2010) has indicated that there is no perfect research approach. His position is that research approaches need to be "chosen carefully, thoughtfully, systematically and ethically" (p 13). Darbyshire (2010) also advocates the mixed methods approach to obtain a more complete understanding of any situation. An example of using a mixed methods approach is by Baines, Joseph & Jindal (2002) who used the qualitative research approach of interviews with phenomenological analysis as well as the quantitative Beck Depression Inventory to assess and gain a deeper understanding of the lived experience and emotional issues associated with renal transplantation.

Discussion

Whilst hypotheses testing can demonstrate a difference between groups, the numerical rate of difference may not adequately illuminate meaning (Fishbane

& Goldman 2002) and the researcher or reader is left to deduce the reasons why there was a difference. This is where the addition of a qualitative research approach can bring a deeper meaning to the research findings. The Peng et al (2005) study clearly demonstrated that the two group's sexual behaviour was different but whether the difference in sexual activity was due solely to variations in age or possibly another variable, such as length of time with end stage renal disease, is not clear and needs further exploration.

Nephrology nurse researchers are required to ensure that the qualitative research approach used is appropriate to explore the research question (Wimpenny & Gass 2000). As well, there is a need to make all critical decisions clear (Mills et al. 2006) so that results of decisions and actions taken throughout the study are beyond question and will stand up to the scrutiny of other qualitative nurse researchers (Maggs-Rapport 2000; Schneider et al. 2005; Rolfe 2006).

Other nurse researchers need to be convinced that the researcher has accessed and accurately represented the situation under study in a coherent, complete and meticulously checked exploration of all the multiple realities (Sandelowski 1993; Grbich 1999). Therefore validity in the qualitative context becomes the display of the research process undertaken by the researcher through which the results of a study come to be viewed as sufficiently transparent, credible and trustworthy for other nurse researchers to rely upon during their own investigative work (Guba & Lincoln 1989; Grbich 1999; Duffy 2007).

Some leading nurse researchers have suggested that qualitative research should be undertaken using only one qualitative approach and that multiple qualitative approaches may lack in trustworthiness (Annells 2006). However, a position that is gaining strength among other qualitative nurse researchers is that using two or more qualitative approaches is a credible strategy in the creation of a plausible and trustworthy narrative (Maggs-Rapport

2000; Annells 2006). Therefore the nephrology nurse researcher has a choice to use only one single qualitative research approach or alternatively to use a multiple of approaches to firstly explore their research question and then follow up with another qualitative approach to confirm their findings. A suggested approach would be to collect data on a particular research question using focus groups and analyse the data using a phenomenological approach. Follow up of the findings could be achieved by undertaking an ethnographic study to gain a deeper understanding of the culture surrounding that particular area of research.

Conclusion

In conclusion, this paper has provided useful information on the strengths and weaknesses of both qualitative, quantitative and mixed methods research approaches for the novice nephrology nurse researcher. The quantitative approach uses RCT's with hypothesis testing in the discovery of "truth", while the qualitative research approach views the discovery of "truth" from a multiplicity of personal viewpoints. The features of the three most commonly used qualitative research approaches of phenomenology; ethnography and Grounded Theory have been critiqued. Phenomenology is an approach that allows the novice nephrology nurse researcher to capture the essence or viewpoint of a person living with a particular disease such as CKD. Ethnography allows the nurse researcher to enter the field and discover the culture within an organisational unit such as a renal unit and Grounded Theory allows the nurse researcher to discover the sociological processes and develop nursing practice theory associated with complex chronic illnesses such as CKD.

Contributions

SC developed the concept of the paper, literature review and drafting of the manuscript while JR and SC made critical revisions and editing of the final paper.

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