

Understanding paradigms used for nursing research

Kathryn Weaver BN MN PhD RN

EQUIPP Postdoctoral Fellow, Faculty of Nursing, University of Alberta, Alberta, Canada; and Assistant Professor, Faculty of Nursing, University of New Brunswick Fredericton, New Brunswick, Canada

Joanne K. Olson PhD RN

Professor, Faculty of Nursing, University of Alberta, Alberta, Canada

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Correspondence:

Kathryn Weaver,
International Institute for Qualitative
Methodology,
Faculty of Nursing,
University of Alberta,
6-10 University Extension Centre,
8303-112 Street,
Edmonton,
Alberta T6G 2T4,
Canada.
E-mail: kweaver@unb.ca

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Aims. The aims of this paper are to add clarity to the discussion about paradigms for nursing research and to consider integrative strategies for the development of nursing knowledge.

Background. Paradigms are sets of beliefs and practices, shared by communities of researchers, which regulate inquiry within disciplines. The various paradigms are characterized by ontological, epistemological and methodological differences in their approaches to conceptualizing and conducting research, and in their contribution towards disciplinary knowledge construction. Researchers may consider these differences so vast that one paradigm is incommensurable with another. Alternatively, researchers may ignore these differences and either unknowingly combine paradigms inappropriately or neglect to conduct needed research. To accomplish the task of developing nursing knowledge for use in practice, there is a need for a critical, integrated understanding of the paradigms used for nursing inquiry.

Methods. We describe the evolution and influence of positivist, postpositivist, interpretive and critical theory research paradigms. Using integrative review, we compare and contrast the paradigms in terms of their philosophical underpinnings and scientific contribution.

Findings. A pragmatic approach to theory development through synthesis of cumulative knowledge relevant to nursing practice is suggested. This requires that inquiry start with assessment of existing knowledge from disparate studies to identify key substantive content and gaps. Knowledge development in under-researched areas could be accomplished through integrative strategies that preserve theoretical integrity and strengthen research approaches associated with various philosophical perspectives. These strategies may include parallel studies within the same substantive domain using different paradigms; theoretical triangulation to combine findings from paradigmatically diverse studies; integrative reviews; and mixed method studies.

Conclusion. Nurse scholars are urged to consider the benefits and limitations of inquiry within each paradigm, and the theoretical needs of the discipline.

Keywords: integrative review, nursing theory, paradigms, philosophy, research methods

Introduction

Paradigms are patterns of beliefs and practices that regulate inquiry within a discipline by providing lenses, frames and processes through which investigation is accomplished. The need to clarify the paradigms of nursing research has been identified as one of the top 10 issues facing the discipline (Colorado Nursing Think Tank 2001). Working to achieve further clarity will enable nurse researchers to structure inquiry, making explicit the philosophical assumptions underlying their methodological choices. The purpose of this paper is to examine the paradigms used in nursing research and to make recommendations about conducting disciplinary inquiry. To achieve this purpose, we explore the evolution and influence of the various research paradigms on nursing theoretical and disciplinary development, and we present ontological, epistemological, and methodological similarities and differences among positivist, postpositivist, interpretive and critical theory paradigms. The goals of inquiry, place of theory in the research process, and nature of knowledge sought within each paradigm are described. We recommend a pragmatic approach to conducting disciplinary inquiry and we suggest integrative strategies that clarify the theoretical perspective most needed to build disciplinary knowledge.

Background

Defining research paradigms

The task of clarifying the paradigms used for nursing research is complicated by semantic confusion between the terms 'paradigm', 'disciplinary matrix', 'research tradition' and 'worldview'. Kuhn (1970) uses the term 'paradigm' (p. 10) to describe a heuristic framework for examining the natural sciences and 'disciplinary matrix' (p. 182) for social sciences. Laudan (1977) defines a 'research tradition' as the 'set of general assumptions about the entities and processes in a domain of study, and...the appropriate methods to be used for investigating the problems and constructing the theories in that domain' (p. 81). Kikuchi (2003) equates paradigm with an individual's perceived 'worldview'. It is beyond the scope of this paper to differentiate extensively between these various terms to determine if they all describe the same phenomenon. We will use the term 'paradigm' – despite criticism of its ambiguous and inconsistent use – as it has been most often understood and applied by nurse scholars (e.g. Allen *et al.* 1986).

We understand paradigms to be mechanisms to bridge a discipline's requirements for knowledge and its systems for

producing that knowledge. Paradigms are lenses for viewing and interpreting significant substantive issues to the discipline. Issues deemed worthy of pursuit are prioritized; others are suppressed (Cheek 2000). Paradigms are also frames that hold the vocabulary, theories and principles, as well as the presuppositions and values related to an inquiry (Thompson 1985, Moccia 1988, Bunkers *et al.* 1996). We further define paradigms as sets of philosophical underpinnings from which specific research approaches (e.g. qualitative or quantitative methods) flow.

Paradigms are established by communities of scholars with shared beliefs about the nature of reality and knowledge construction (Jacob 1989, Hinshaw 1996). They are human constructions categorized by differences in beliefs and values (Hamilton 1994). As such, paradigms can be neither proved nor disproved (Moccia 1988, Guba 1990). This may create doubt about how best to initiate inquiry. According to Kuhn (1970), all disciplinary research is conducted within paradigms. The approaches to inquiry open to a researcher within a particular paradigm are defined by the paradigm itself (Laudan 1977).

The paradigms that have been used for nursing research are positivist, postpositivist, interpretive and critical social theory. The positivist paradigm arose from a philosophy known as logical positivism, which is based on rigid rules of logic and measurement, truth, absolute principles and prediction. Postpositivism has emerged in response to the realization that reality can never be completely known and that attempts to measure it are limited to human comprehension. The interpretive paradigm emphasizes understanding of the meaning individuals ascribe to their actions and the reactions of others. The critical social theory paradigm is concerned with the study of social institutions, issues of power and alienation, and envisioning new opportunities (Gillis & Jackson 2002).

It is widely held that adherence to one paradigm predetermines the direction of theory development for a discipline, ultimately delimiting knowledge available for utilization in practice. The different types of knowledge required for nursing practice may be constructed from single or multiple modes of inquiry. Fawcett *et al.* (2001) advocated for multiple modes of inquiry to meet nursing's knowledge needs. Van der Zalm and Bergum (2000) illuminated the empirical, moral, aesthetic, personal and socio-political contributions to knowledge that arise from using a single mode of inquiry. Rather than uncritically prescribing single or multiple modes of inquiry, we support basing research on a clearer, more integrated understanding of the paradigms used for nursing inquiry.

Evolution of paradigms for nursing research

Since the time of Nightingale, nursing has been concerned with acquiring theoretical knowledge for application to practice. Initially, nursing borrowed theories from other disciplines to meet its practice needs (Meleis 1997). Early theoretical ideas unique to nursing were derived mainly from clinical observations, personal knowledge and philosophical thinking (Kirkevold 1997). These early nursing perspectives were useful for articulating the nature of nursing and guiding practice but less useful for guiding nursing research (Hinshaw 1999). The evolution of nursing as a professional discipline necessitated the establishment of a scientific research base (Wuest 1994, Donaldson & Crowley 1997/1978) to increase disciplinary credibility.

The effort to increase credibility has been influenced by factors within and external to nursing. Internally, attention has been directed towards developing a specialized knowledge base that could be taught to students and used to distinguish professional education from technical training. Externally, nursing has struggled to differentiate itself from medicine and to develop the knowledge to respond to changing societal needs (e.g. technological advances, increased scope of nursing practice). To develop a scientific base for nursing and to seek professional status in esteemed medical and academic institutions, nurse researchers at first followed the dominant positivist paradigm (Cull-Wilby & Pepin 1987, Nagle & Mitchell 1991).

Positivism

Positivism, referred to as the received view, uses scientific method to develop general abstract laws describing and predict patterns in the physical world (Suppe & Jacox 1985). Theory is established deductively through formal statistical testing of hypotheses (Lincoln & Guba 1985). Objective generalizable theory is sought via stringent control of contextual variables. The influence of positivism can be seen in the conceptual models of Orem and Roy (Nagle & Mitchell 1991, Barrett 1992) and in such tools as nursing diagnoses and practice standards (Dzurec 1989, Drew & Dahlberg 1995).

Postpositivism

Research in the postpositivist paradigm continues the positivist emphasis on well-defined concepts and variables, controlled conditions, precise instrumentation and empirical testing (Guba & Lincoln 1994). Objective knowledge is sought through replication. The postpositive paradigm is judged appropriate for the study of nursing questions requiring systematically gathered and analysed data from

representative samples (Bunkers *et al.* 1996), technical clinical knowledge about specific interventions (Horsfall 1995), and predictive theories for at-risk individuals and populations (Norbeck 1987).

Interpretive

The Heideggerian view of the nature of being-in-the-world and of humans as self-interpreting has spurred the evolution of the interpretive paradigm (Holmes 1996, Appleton & King 1997). In this paradigm, intersubjectivity (mutual recognition) between researcher and research participants is fostered and valued (Dzurec 1989, Horsfall 1995). Phenomena are studied through the eyes of people in their lived situations. The unitary nature of person-with-environment is congruent with the individualized, holistic practice espoused by the nursing discipline (Drew & Dahlberg 1995). Examples of nursing theories developed within the interpretive paradigm are Parse's (1992) *Human Becoming*, based on the inseparability of humans and their environments, and Leininger's (1988) *Transcultural Nursing*, concerned with culturally competent care for people of similar or different cultures.

Critical social theory

Critical social theory, inspired by the writings of Marx, Habermas and Freire, includes feminist, grassroots and emancipatory movements. It is concerned with countering oppression and redistributing power and resources (Maguire 1987, Lutz *et al.* 1997). A critical theory perspective assumes that truth exists as 'taken for granted' realities shaped by social, political, cultural, gender and economic factors that over time are considered 'real' (Ford-Gilboe *et al.* 1995). Within the critical theory paradigm, research becomes a means for taking action and a theory for explaining how things could be (Maguire 1987). Process, not product is emphasized (Thorne 1999). A desired focus is praxis, or the combination of reflection and action to effect transformation (Mill *et al.* 2001).

Method

Integrative review of the literature describing the various paradigms was conducted using Ganong's (1987) method of analysis. This method was selected because it provides a structured, practical approach to identifying and understanding relevant themes and differences in a body of literature. The method consists of (a) formulating questions for the review, (b) making decisions about what to review, (c) organizing the characteristics of the literature reviewed and (d) evaluating the reliability of ideas, arguments and findings. The questions we formulated were: What are the similarities and differences in the assumptions underlying the

paradigms used for nursing research? What is the significance of paradigms to theory and disciplinary knowledge development? What are the consequences in choosing one paradigm for nursing research over others?

We addressed these questions through study of the theoretical and philosophical literature. Using the keywords research paradigm, research tradition, disciplinary matrix, worldview, nursing knowledge, positivism, postpositivism, interpretive, and critical social theory, material was identified from the computerized databases for nursing, allied health, medical and educational literature (e.g. CINAHL, Medline, Pubmed, EBSCO and ERIC). Primary sources were identified by reviewing the reference lists of the retrieved material. We did not limit the search to a specific timeframe as the history of nursing research and nursing science has been short. The sample consisted of 72 journal articles and chapters published in English.

To organize the characteristics of the literature reviewed and to determine the current state of knowledge, we constructed a table using as columns the categories for comparison that emerged from the reading and as rows the individual paradigms (see Table 1). Critical analysis was completed by identifying underlying assumptions, examining the logic of explanations, evaluating the content of each work in light of previous work, and clustering results. We carried out what Kirkevold (1997) defines as a *synopsis review* in that we clarified and portrayed systematized information about each paradigm without attempting to unify the alternative theoretical positions.

Findings

Comparing and contrasting the paradigms

The philosophical underpinnings of the positivist, postpositivist, interpretive and critical theory paradigms of nursing research were assessed for similarities and differences. The interpretive paradigm differed ontologically from the others because it is based on relativism, a view of truth as composed of multiple local and specific realities that can only be subjectively perceived (Allen *et al.* 1986, Guba 1990). Positivist, postpositivist and critical theory paradigms are based on realism, a view of truth as universal and independent of human perception of it. Postpositivist and critical theory paradigms are based on the assumption that this universal truth may not be accessible to everyone (Allen *et al.* 1986, Guba & Lincoln 1994). Positivist and postpositivist paradigms differed epistemologically from the others in their assumption that observations can be objective and either 'value free' or 'value neutral' (Norbeck 1987, Schumaker & Gortner 1992). Researchers

working within interpretive and critical theory paradigms have considered observations as subjective, 'value relative', or 'value mediated' (Lincoln & Guba 1985). In addition, researchers in the interpretive paradigm have sought *intersubjectivity* or shared subjective awareness and understanding within the research relationship. Methodologies associated with each paradigm reflected the ontological underpinnings of relativism or realism and epistemological underpinnings of objectivity, subjectivity or intersubjectivity. For example, the participatory action research approach of critical social theory was developed to reveal hidden power imbalances, learn how people subjectively experience problems, and make this knowledge publicly available.

We further examined the paradigms to distinguish differences in the goals of inquiry, nature of knowledge sought, and the place of theory in the research process. With the overall aim of creating good science, the goals of research within each paradigm varied. The goals of positivist and postpositivist paradigm research were control and prediction (Allen *et al.* 1986, Guba & Lincoln 1994); the goal of interpretive research was understanding (Ford-Gilboe *et al.* 1995) and that of critical theory was emancipation (Maguire 1987). Theoretical knowledge of truth as an absolute entity was sought in the positivist paradigm, and truth as a probable value was sought in the postpositivist paradigm (Guba & Lincoln 1994, Letourneau & Allen 1999). Practical knowledge to help understand or change the social world was the focus of interpretive and critical theory paradigms. This type of knowledge, co-constructed between researchers and research participants, was subject to continuous revision (Campbell & Bunting 1991, Kim 1999). In the positivist and postpositivist paradigms, theory was established deductively. The positivist focus was on verifying hypotheses and replicating findings (Lincoln & Guba 1985, Morse & Field 1995); the postpositivist focus was on falsifying hypotheses (Guba & Lincoln 1994). In the interpretive paradigm, theory emerged inductively – hypotheses were formulated and tested to generate theory, and established theory was used to explain the data (Lincoln & Guba 1985, Morse & Field 1995). Theory and knowledge in the critical social theory paradigm were closely linked in that theory made shared meanings of social interactions explicit and illuminated embedded barriers to autonomy and responsibility (Allen *et al.* 1986, Mill *et al.* 2001).

Significance of paradigms to nursing theory development

The evolution of multiple paradigms has sparked extensive debate over the need to determine if one, a combination of several, or any at all is best for nursing research. We assessed

Table 1 Paradigms used for nursing research

| Contributions | Limitations |
|--|---|
| Positivist | |
| Generalizability of findings beyond a particular sample (Baker <i>et al.</i> 1998) | Context stripping limits application to practice (Schumaker & Gortner 1992) |
| Produces description and prediction (Allen <i>et al.</i> 1986, Labonte & Robertson 1996) | Explanation as well as description and prediction needed to guide nursing intervention (Schumaker & Gortner 1992) |
| Objectivity enhances credibility. Only directly observable theoretical entities held to exist; researcher role is detachment (Allen <i>et al.</i> 1986, Guba & Lincoln 1994, Clark 1998) | 'Value free' observations impossible as observations based on perception, a function of prior knowledge and experience (Schumaker & Gortner 1992, Playle 1995). Scientists may ensure the status quo (Gould 1981) |
| Attempts to discover universal truth through verification (Lincoln & Guba 1985, Gortner 1993) | Absolute truth is rarely if ever established (Chinn 1985) |
| Belief that scientific methods used to investigate the physical world can be used to investigate the social world (Feyerabend 1990) | Humans seen as extensions of nature described via causal mechanical laws (Kleynhaus & Cahill 1991). Ignores possibility that humans actively construct their social world and knowledge (Blummer 1969) |
| Postpositivist | |
| Recognizes fallacies of verification. Seeks to falsify hypotheses (Gortner 1993) and establish probable truth (Maguire 1987) | Knowledge claims represent probabilities about human phenomena rather than universal governing laws (Letourneau & Allen 1999) |
| Attempts holism by including subjective states (Schumaker & Gortner 1992) and multiple perspectives and stakeholders (Letourneau & Allen 1999) | Neglects 'whole' person by studying parts (Pearson 1990, Nagle & Mitchell 1991). Does not make explicit how the views of patients as stakeholders are drawn into the research process |
| Powerful, i.e. attracts funding (Guba & Lincoln 1994, Cheek 2000) | Theory development controlled by others outside of discipline. Power influences what can and will be known (Dzurec 1989) |
| Encourages precision, caution and scepticism (Gortner 1993). Credibility through conformity with judgment of peers (Letourneau & Allen 1999) | Conformity with peers within postpositivist paradigm may lead to becoming 'pot-bound' |
| Logical for study of phenomena such as genetic issues and epidemiology (Norbeck 1987). Defines boundaries of nursing separately from social sciences (Drew 1988, Gortner 1993) | No 'cookbook' techniques for achieving balance of heterogeneous qualitative and quantitative methods (Letourneau & Allen 1999, p. 627) |
| Interpretive | |
| Inquiry is means for articulating, appreciating, and making visible the voices, concerns and practices of research participants (Benner 1994) | May ignore ecological, historical, and risk factors (Gortner 1993) |
| Focus is subjectivity and intersubjectivity (Dzurec 1989, Drew & Dahlberg 1995, Horsfall 1995) | Loss of objectivity limits ability to discriminate patterns that are fundamental to humans (Allen 1985) |
| Truth viewed as multiple realities that are holistic, local, and specific (Ford-Gilboe <i>et al.</i> 1995) | Less explanatory power as infinite number of interpretations are possible for a given phenomenon (Berger & Luckmann 1966) |
| Seeks understanding, shared meaning, and embedded meaning (Allen & Jensen 1996) | Theorizing limited because the human state is not objectified outside of the lived experience and present (Gortner 1993) |
| Meaning is constructed in the researcher-participant interaction in the natural environment (Guba & Lincoln 1994, Ford-Gilboe <i>et al.</i> 1995, Hinshaw 1999) | Discomfort with the uncertainty of the ever-changing nature of knowledge |
| Critical social theory | |
| Exposes oppression through understanding shared meanings of political, social, historical and cultural practices that impede equal participation (Ludz <i>et al.</i> 1997) | Emphasizes rationality while excluding feelings despite the emancipatory potential of feelings (Campbell & Bunting 1991) |
| Theory and practice closely linked. Research goes beyond description towards action to change inequities (Mill <i>et al.</i> 2001) | If researchers know ahead of time that social action is needed, then do not need research to justify this (Gortner 1993) |
| Ensures representation of diverse and under-represented views (Gortner 1993, Wuest 2000) | The one who critiques is part of the culture being critiqued which suggests complicity (Reed 1995) |
| Practitioners can develop tacit knowledge from practice via criticism and reflection (Fawcett <i>et al.</i> 2001) | Practitioners may not see themselves as researchers or theorists and practice as data (Tolley 1995) |
| Research process characterized by continual redefinition of problems and by cooperative interaction between researchers and those whose environment is being researched | Focus on problems defined by oppressed groups and collective humanity. May exclude the individual and personal level. Some research team members may have more power than others (Campbell & Bunting 1991) |

the utility of a unitary, pluralist, or anti-paradigmatic approach to guide inquiry through identification of each paradigm's contributions and limitations.

Contributions

Different benefits to nursing theory development were associated with various research studies within the postpositivist, interpretive and critical theory approaches. Nursing research conducted within the postpositivist paradigm contributed to health promotion, illness prevention and professional education. For example, through postpositivist quantitative inquiry, Faye and Yarandi (2004) identified that African American women were at greater risk of depression because of lower income, lesser education and residency in rural communities. Treat-Jacobson and Lindquist (2004) found the intensity of exercise required to receive functional benefit following cardiac bypass surgery to be less than many people realized. A study of the knowledge and attitudes of nurses caring for patients with AIDS (Walusimbi & Okonsky 2004) provided baseline data from which to determine appropriate educational interventions for nurses.

Nursing research conducted in the interpretive paradigm involved different qualitative methods to gain in-depth and detailed description, understanding and explanation of ordinary occurrences as experienced by those in the field. For example, Austin *et al.* (2003) used a hermeneutic phenomenological approach to understand the experiences of nurses attempting to address ethical concerns in patient care within health institutional environments. Through participant observation fieldwork, Ellefsen and Kim (2004) obtained information about how nurses view, interpret and receive the meanings of clinical situations. These findings using the interpretive paradigm research have identified specific strategies nurses use with patients that can inform and improve nursing practice.

Researchers conducting inquiry in the critical social theory paradigm have made it their responsibility to raise awareness of social problems and to ensure that the voices and perspectives of marginalized people are heard. In keeping with this mandate, Georges (2002) called for greater examination of the context of social and political inequities creating and sustaining suffering. Bermann (2003) described the need for researchers who work with children, in which empowerment is a goal, to acknowledge power imbalances in research relationships and to enable children to shape the interviews.

Limitations of the paradigms

Our review revealed limitations associated with each paradigm (see Table 1). Positivist and postpositivist research

approaches, in denying social contexts and intersubjectivity within research relationships, may perpetuate technically-oriented practice (Horsfall 1995). Positivism has tended to be inconsistent with holistic practice in its denial of unobservable values, including spiritual aspects and relationships within complex socio-political, ecological environments. Its claims of producing value free observations and discovering universal truth are questionable. The major criticism of postpositivism is its reduction of people to parts and its dehumanization of them to scores and percentages for statistical analyses.

Research within the interpretive paradigm has tended to ignore the influence of biological factors and social structures on individual action. The loss of objectivity (e.g. multiple interpretations of multiple realities, non-objectification of the human state) has limited theorizing. The interpretive approach can be criticized for its underlying assumptions about all being equal. Critical theory, shown to value the collective above the individual, has tended to demean participants asked to respond to shared, pre-existing social orders they had no part in creating. Critical theory researchers have been criticized for their complicity in being part of the culture they critiqued and for suppressing findings incompatible with their beliefs.

Unitary paradigm

Those who have embraced a unitary or a single paradigm approach for nursing research have asserted that incommensurable ontological and epistemological differences among the paradigms required choosing one over the others for specific research projects. In this way, the set of beliefs about health, relationships of person with environment and goal of nursing knowledge expressed in the paradigm were preserved (Mitchell & Pilkington 1999). Donaldson and Crowley (1997/1978) have explained that a discipline is characterized by 'a unique perspective, a distinct way of viewing all phenomena, which ultimately defines and limits the nature of its inquiry' (p. 242). While they have articulated the need for an overarching framework of values agreed to by members of the discipline, clearly Donaldson and Crowley have not explicitly recommended establishment of a single research perspective. The overarching framework for nursing inquiry could endorse research approaches within diverse paradigms (Northrup 1992, Reed 1995).

Paradigmatic plurality

Proponents of paradigmatic plurality (combination of several paradigms) have argued that knowledge developed from one

perspective could complement knowledge developed from another (Leddy 2000). They recommended harnessing the processes and products from multiple paradigms to meet nursing demands for knowledge for practice (i.e. scientific knowledge, professional judgment in the form of personal knowledge of clients, humanistic connection, and clinical experience to aid ethical decision-making). Rolfe (1998) provided the example of a nurse who found scientific knowledge helpful to determine patient status. However, such knowledge could not direct the nurse about how to respond when a patient asked if he was dying. 'In a discipline that deals with human beings, it is perhaps not feasible that only one theory should explain, describe, predict, and change all the discipline's phenomena' (Meleis 1997, p. 77).

Anti-paradigmatic inquiry

An argument for anti-paradigmatic inquiry has been put forward by Kikuchi (2003). She recommended studying only questions that all participants could answer, and approaching questions in 'piece-meal' (p. 13) fashion. We agree that research conducted as a public enterprise towards which all members of a discipline can work may help to enlarge the disciplinary body. However, we are concerned that such research might limit rather than expand the pursuit of some of the types of knowledge needed for nursing practice (e.g. emic perspectives, narratives, issues of power and control). We also question whether this anti-paradigmatic stance is representative of the positivist paradigm, in which research questions are either limited to those that can be posed in terms of independent and dependent variables (Dzures 1989) or to variables whose existence can be directly verifiable (Schumaker & Gortner 1992, Clark 1998).

Addressing the paradigms debate

In order for nursing to resolve the paradigm debate, we believe that nurses must come together and address the thoughtful questions raised by Barrett (1992). These questions are concerned with which paradigmatic philosophy best reflects nursing values, what processes could be used to pursue a unified disciplinary path, who will determine the one right approach, and who will relinquish their own commitment for the sake of unity. Based on our consideration of the literature, we could not justify choosing one paradigm over others when most can inform different aspects vital to nursing practice. Theory arising from postpositivist paradigm inquiry has yielded prescriptive or situation-producing theory, such as interventions for managing specific health or illness threats (Gortner 1993). Theory generated through

interpretative paradigm inquiry has enabled nurses to develop insights into unique individual responses within clinical situations that could improve the care of those involved (Van der Zalm & Bergum 2000). Knowledge constructed via critical social theory has benefited people collectively by uncovering and transforming oppressive situations (Mill *et al.* 2001).

We identify a trend in the literature towards using multiple paradigms for nursing research (e.g. Cull-Wilby & Pepin 1987, Monti & Tingen 1999). We do not support anti-paradigmatic nursing inquiry because of its potential to exclude important topics not researchable from all paradigm perspectives. We are concerned that its 'top down' application of general principles to particular cases may limit knowledge construction to existing conceptualizations.

Discussion

Nursing's obsession with the paradigm debate has occupied much space in the literature. Failure to build the nursing knowledge base comprehensively has been assumed to result from the lack of a consensual overarching framework for conducting research. Yet nursing has not pursued 'integration of nursing research from the level of a conceptual framework for a particular study to the level of more general theories and ultimately to that of a unified body of nursing knowledge' (Donaldson & Crowley 1997/1978, p. 237). We must, therefore, ask ourselves and our discipline if the current state of fragmentation of nursing knowledge has been the result of limited nursing inquiry in which individual studies were not related to one another, or if it has been the result of research emanating from an individual paradigm, a collective paradigm, or no paradigm at all.

Pragmatic approach to evaluating disciplinary inquiry and theory development

In research, the purpose and the question guide inquiry and knowledge development (e.g. Burns & Grove 2001, Morse & Richards 2002). The choice of a research paradigm and method are also guided by the current state of knowledge about a particular area of nursing. For example, within a positivist or postpositivist paradigm a randomized controlled study cannot be conducted if the variables to be controlled have not first been defined. There is no need for interpretive paradigm inquiry if we already know what is being hypothesized and what we are apt to find. The participatory action research of the critical social paradigm is inappropriate if the knowledge sought is merely shared views, without opportunity to engage in action to address domination and power inequities.

In addition, two ideas must be kept in mind when considering the choice of research paradigm. The first is that scholars often restrict research questions to those that can be studied within the paradigms with which the scholars align themselves. The second is that not all paradigms are afforded equal credibility. Legitimacy is conferred by certain groups (e.g. funding and publication review boards) who regulate what constitutes valid research. Pursuing inquiry in one paradigm may further the interests of a dominant stakeholder, while diverting energies away from developing sensitive methodologies and unique research interests needed for nursing (Horsfall 1995).

To reduce these potential sources of bias, it seems necessary to determine criteria and a process for evaluating disciplinary inquiry. A measure of the effectiveness of an inquiry is its problem-solving ability or usefulness to those involved (Laudan 1977). It is also recommended that nursing research priorities be situational-specific and practice-based (Dickoff & James 1968, Im & Meleis 1999). Moreover, the basic concern of all nursing research is to improve the health and wellbeing of the people studied (Ford-Gilboe *et al.* 1995, Warms & Schroeder 1999). Thus, theory development in nursing must support service to people and the health of society.

We believe that nursing inquiry may be effectively evaluated through a pragmatic approach. The term pragmatism is derived from the Greek word for action, from which the words 'practice' and 'praxis' originate (Barnhart 1995, James 1907/1998). Pragmatism is determining the value of an idea by its outcome in practice and conduct (James 1907/1998). A pragmatic approach stresses critical analysis of facts, applications and outcomes rather than abstraction and verbal solutions (James 1907). This approach can move nursing beyond the boundaries and restrictions of a single paradigm towards theory construction tailored to fit particular situations (Doane 2003). Surely the tenets of pragmatism (i.e. commitment to what works in practice, appreciation of plurality, and desire for integrated results) are relevant to nursing? Nurse clinicians have identified that theory-practice gaps exist when theory does not address diverse practice demands (e.g. Hanchett 2001). A pragmatic approach calls for theory to be designed and tested in practice. This could counter passive acceptance of inquiry conducted for reasons other than to improve the health and comfort of those whom nursing serves. A pragmatic approach could stimulate inquiry that complements one paradigm with another.

Strategies to develop nursing knowledge

We suggest that inquiry should start with assessment of the existing theoretical base containing findings from diverse,

disparate studies. Critical analysis or review and critical appraisal are modes of inquiry that integrate the literature. They can help to determine if research within a single paradigm is sufficient to meet practice demands. To critically analyse or review means to examine the existing literature on a particular topic, determining weaknesses in the research or inconsistencies in findings (Kirkevold 1997). This can identify gaps in available knowledge, areas where existing knowledge is untrustworthy, and areas requiring further information before conclusions can be drawn. The findings from critical analysis or review can assist nurse clinicians to judge if the knowledge base is solid enough for practical application. Critical appraisal involves exploration of pragmatic utility (Morse 2000), and synthesizes key substantive content to direct inquiry towards areas that need development. Overloaded or under-researched areas impinging on and influencing practice can thereby be opened up (Horsfall 1995). Critical appraisal can help to explicate the sociopolitical historical context within which health and illness problems are developed and addressed.

Following critical assessment of the literature, nursing knowledge may need to be developed in under-researched or underdeveloped areas. This reopens the issue of which paradigm to use. As previously discussed, the purpose of the inquiry, in conjunction with the state of knowledge development in the substantive area, should guide paradigm selection. A pluralist approach may have greater utility to nursing because it holds that research from various paradigms can contribute to the development of knowledge needed for nursing practice.

How best to utilize a pluralist approach to inquiry and subsequent theory development without violating the philosophical underpinnings of the individual paradigms is not well described in the literature. One strategy is to design a research programme comprised of parallel studies within the same substantive domain, using different paradigms. This preserves the theoretical and philosophical clarity of each tradition (Mitchell & Pilkington 1999). Follow-up integrative techniques, such as conceptual triangulation of research findings (Foster 1997) and integrative review (Kirkevold 1997), could then be implemented to synthesize knowledge from the separate research studies. Conceptual triangulation is a procedure for combining findings from paradigmatically diverse studies in such a way as to safeguard individual study designs. It involves integrating findings from research completed in different paradigms after considering threats to rigour and examining the strength of the evidence (Foster 1997). Integrative review enables integration of relevant information from isolated studies into a comprehensive account (Kirkevold 1997). Additionally, mixed methods

What is already known about this topic

- Nursing knowledge has been developed from a variety of research approaches within multiple paradigms.
- The need to clarify the paradigms used for nursing research is an important issue facing the discipline.
- Individual research paradigms, while serving to protect the integrity and rigor of knowledge construction within a scientific community, may define and restrict approaches to inquiry.

What this paper adds

- Critical analysis of the research approaches within various research paradigms does not justify choosing one paradigm over others.
- The discipline's task of developing knowledge may be enhanced through the use of integrative strategies that maintain the theoretical perspectives of individual research paradigms.
- An anti-paradigmatic approach to research may limit disciplinary knowledge development.

studies (i.e. using quantitative and qualitative methods from different paradigms in a single study) can help to accumulate knowledge without crossing paradigmatic boundaries if researchers clarify in advance the contribution of each paradigm (Morse 1991). We think these strategies could help to reduce theory–research–practice discrepancies because they respect theoretical perspectives.

Pluralistic integrative approaches can suggest important new lines of research, empowering researchers to address problems which cannot be resolved satisfactorily by adherence to inquiry within a single paradigm. These approaches can be undertaken by communities of scholars who, as Hinshaw (1996) has predicted, will continue the growth of the nursing knowledge base through critique, constructive criticism and challenge of ideas. With attention to theoretical perspectives, we contend that findings within multiple paradigm can be integrated to increase the cumulative knowledge needed for the substance of our discipline and to provide relevant research-based knowledge to clinical nurses.

Conclusion

Integrative review of the major paradigms used for nursing research has allowed us to identify issues that potentially limit theory and disciplinary development. Embracing different paradigms for nursing research, while responding to the need for knowledge to direct nursing practice, had introduced

confusion and perhaps intolerance and competition. To understand better the paradigms used for nursing research and to begin to resolve the tension between unitary, pluralistic and anti-paradigmatic perspectives, we have examined the philosophical underpinnings and knowledge development within individual paradigms and assessed the pragmatic utility. No single paradigm emerged as unequivocally superior to another for nursing research. Rather, knowledge resulting from research within each paradigm was sought and valued for its contribution in describing, interpreting, explaining and predicting the complexity of human health experiences and illness responses. Critical assessment of the existing theoretical base will help nurses adequately to understand and address nursing's knowledge needs. We recommend pluralistic approaches that maintain the individual theoretical perspectives of each paradigm because such approaches protect the integrity and rigour of knowledge construction, thus insuring a more worthwhile and valuable contribution to disciplinary development. The practice of situating research within paradigms, as well as the knowledge resulting from research processes, must be considered in the light of their ability to advance the social mission of nursing: to enhance health and wellbeing and alleviate suffering.

Author contributions

KW contributed to study conception, design and drafting of the manuscript; KW and JO contributed to critical revisions of the manuscript for important intellectual content; JO supervised the study.

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