Qualitative theory testing as mixed-method research

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Abstract

While the concept of mixed-methods research is more usually associated with combining quantitative and qualitative approaches, this paper outlines a study that mixed methods by undertaking qualitative theory testing and derivation when examining the relationship between health promotion theory and hospital nursing practice. Thus, it is concerned with relating the metatheoretical aspects of the debate and not with the pragmatic aspects of the research and concomitant methods. A deductive–inductive–deductive design, based on the theory–research–theory strategy of Meleis (1985), tested, revised and developed for nursing established health promotion theory using theory-testing criteria. To complement the methodological mix, the study also used the theory (i.e. a health-promotion taxonomy) as a framework to contextualise the findings rather than generate theory in the way associated with interpretative inquiry. While inconsistent with the traditional view linking theory testing with quantitative, objective epistemology, the process enabled a theoretically robust health-promotion taxonomy to be synthesised and advanced for use in nursing in relation to a paradigm of social thought.

Keywords: mixed method, qualitative theory testing

Introduction

Health promotion is characterised by an absence of an agreed unifying system for classifying theory and practice (Naidoo and Wills, 2000; Tones and Tilford, 2001). This conceptual confusion is exacerbated by the plethora of competing health-promotion taxonomies generated mostly from outside nursing, and ostensibly suggests a wealth of intervention strategies. In reality, and despite varied nomenclature, many of these are merely minor variations on the same themes, cover the same terrain, reflect the same aims, modes of intervention and outcomes and seem interchangeable. However, this level of technical similarity can be deceptive as it masks issues to do with theoretical rigour, depth and breadth. The issue for nursing is how to select an exemplar which can be used as a basis for theorising and to classify, guide and plan health-promotion practice and for strategic and organisational analysis. In light of this, the purpose of the study was to identify criteria for internal 'theory testing' and to systematically evaluate and delineate between health-promotion taxonomies to enable the selection of a robust construction that was fit for purpose, which could then be 'theory tested' further as a tool for use in nursing.

Health-promotion taxonomies

A systematic, critical review of the literature highlighted copious health education and health promotion taxonomies that, for the most part, were variations on a theme. Most were descriptive, factor-isolating, pragmatic and limited in their breadth and depth of theoretical analysis, and lacked reference to socio-political philosophy and thus what their inherent models represent from an ideological and epistemological perspective. A notable exception to this was the work of Beattie (1991). His multidimensional framework facilitated an analysis of power and control in the client–practitioner relationship (Naidoo and Wills, 2000) and the ownership of knowledge (Rawson and Grigg, 1988), and delineated individual and population modes of intervention.

Beattie (1991) also highlights that each health-promotion model is based on a socio-political philosophy and assumptions about the social world. In operating from a metatheoretical premise, it embraces competing, dichotomous and incommensurable models and philosophical perspectives. These models are ideologically, epistemologically and methodologically convergent and compatible at some points and divergent and contradictory at others. In depicting the relationship between models, it goes beyond the classifying and categorising factor-isolating theory to the factor-relating theory category (Dickoff et al., 1968). The taxonomy, then, in supplying contrasting metatheoretical assumptions addresses

Feyerabend's (1975) call for theoretical understanding through comparison between alternatives and mutually incompatible positions, with each model of health promotion within the taxonomy acting as an external standard of criticism for others.

Taxonomy of choice

In offering the potential for the research findings on health promotion in hospital nursing practice to be classified, contextualised and integrated with both an established health-promotion framework and ideological and socio-political positions, Beattie's (1991) structure was selected as the framework to be tested for this study. It enumerates four distinct health-promotion models that create a different relationship between the health promoter and the public due to different aims, methods and outcomes of intervention. 'Health Persuasion Techniques' highlights the relationship between disease, risk factors and lifestyle via a range of mass-media health campaigns and via healthcare professionals. It emphasises control of health-related behaviour and highlights the risks to individuals if they fail to pursue the prescribed course of action. 'Personal Counselling for Health' is a personal development and empowerment approach. The focus is on reflection and clarification on the scope for personal life changes based on the subjective perceptions of the client. It entails helping clients to build confidence and self-esteem, develop assertiveness and decision-making skills.

'Legislative Action for Health' seeks to improve the health of populations through health, environmental, welfare and economic legislation, taxation and by implementing policy decisions to address health determinants and social inequalities. This approach also works at the devolved level of Health and Local Education Authorities and at an institutional level (for example, hospitals imposing a smoking ban). 'Community Development for Health' is concerned with community action and collective empowerment. It is a form of direct action where groups of like-minded people with shared problems come together to articulate their concerns and construct a mutually agreed agenda for social change based on their subjective perceptions of problems and expressed needs.

Purpose

The aim of the study was to discover and understand the meaning hospital nurses gave to health promotion and the associated processes and consequences, and establish their degree of fit with existing theory and an established health promotion taxonomy.

Operational definitions

Taxonomies identify, name, describe, group and classify phenomena into ordered categories, communicate the nature, limits and realm of a domain and illustrate the relationship between their subcategories (Bircher, 1975; Polit and Beck, 2006). Rawson and Grigg (1988) describe a taxonomy as a non-hierarchical system of classification and contrast it with a typology, which they see as a dimensional or hierarchical framework with graded distinctions between models. As structures that integrate abstract and general concepts into a meaningful configuration taxonomies, because of their metatheoretical nature, serve as a tool to evaluate the adequacy of theories (Suppe and Jacox, 1985). Consequently convention holds that, unlike theory, they are not themselves empirically testable (Adam 1985, Suppe and Jacox 1985, Fawcett 1991, 1995).

For Kerlinger (1964), Ellis (1968), Schutz (1971), Laudan (1981), Turner (1987), Marriner-Tomey (1989), Rawson (1992) and Polit and Beck (2006), theories specify relationships and connections between phenomena, and organise or integrate collections of propositions, concepts and variables. Theories explain and predict phenomena and explain empirical data which can then be tested against the facts and make findings meaningful. However, these definitions make no reference to the relationship between a theory and a taxonomy or to levels of theorising.

Dickoff et al. (1968) group theories into the four hierarchical levels of factor-isolating, factor–relating, situation–relating and situation–producing. At the simplest level, factor-isolating theories identify, label, name and introduce technical terminology, classify and categorise

concepts. After isolated concepts have been named, described and classified, factor-relating theories highlight the relationships and correlations between concepts and phenomena. Situation-relating theory is of a lower-order causal connection and predictive nature. Situation-producing theory is practice theory of an advanced predictive nature and enables the manipulation of variables and phenomena to produce the desired nursing outcomes of a situation. Thus taxonomies constitute a form of theory, albeit a lower-order factor-isolating and/or factor-relating theory, and are the bedrock of, and a pre-requisite for, subsequent and more advanced (situation-relating/producing) theory.

Health-promotion taxonomy as an 'ideal type'

Beattie's (1991) taxonomy of health promotion exists in abstract only and as such constitutes an 'ideal type' theory. Weber (1971) describes 'ideal types' as internally consistent theoretical devices that give unambiguous expression to conceptual relationships which accentuate aspects of reality. As an 'ideal type', Beattie's (1991) taxonomy is a heuristic device providing clearly stated general concepts that facilitated the classification, comparison and appraisal of the fieldwork findings of the study in relation to multiple perspectives and competing value and belief systems (Jary and Jary, 1991). Although illuminating social phenomena, as untestable hypothetical constructions (Abercrombie et al., 1988) elements of the 'ideal type' are not always observable in reality. However, when applied as conceptual and diagnostic tools that guide analysis (Crotty, 1996) they enhance understanding and help to establish the extent to which reality deviates from the ideal (Crotty, 1996). In other words, the extent to which the 'lived experience' of the health-promotion practice of the participants fits with Beattie's (1991) taxonomy of health-promotion models.

Design

The research design followed the advice of Meleis (1985) and Haase (1987) in adopting the phenomenological approach as a way of developing existing theoretical frameworks. This was facilitated by the theory–research–theory (deductive–inductive–deductive) strategy of Meleis (1985) and derived from the concomitant seven-step method for developing theory in nursing by:

- Formulating the research aim from personal experience and insight.
- Defining concepts.
- Reviewing the literature to compare and map the competing theoretical structures relating to the research focus.
- Selecting the theory of choice and applying theory-testing criteria.
- Developing the methodology, undertaking fieldwork and reporting findings.
- Adapting/synthesising of appropriate theory for nursing.
- Re-examining the revised theory in relation to the research findings.

Methodology and discussion

Application of internal theory testing criteria

The critique of commonly used concepts requires the creation of a measuring stick against which they can be measured, examined and compared (Feyerbend, 1975). Hence, in order to verify Beattie's (1991) work as the taxonomy of choice for this study, its theoretical rigour and adequacy were internally tested against the criteria advanced by Bircher (1975), Fawcett (1995) and indicators of theoretical plausibility. In terms of Bircher's (1975) criteria for taxonomy development, Beattie's taxonomy reflects opposing worldviews of health promotion and was relevant for the purpose of this study and the research problem. The taxonomy can account comprehensively for the conceptual constructions advanced by other authors, and allows for them to be coded with varying degrees of fit into one of the four models. Individual models are clearly defined and described on the same level of abstraction and are mutually exclusive in that interventions are specific to one of the models.

Beattie's (1991) taxonomy conforms to Bircher's (1975) criteria of deriving from, and fully developing a principle of, ordering and to Fawcett's (1995) explication of origins. The latter requires the philosophical premise to be made explicit and the theorists who influenced the author of the taxonomy to be acknowledged. The taxonomy is also consistent with Fawcett's (1995) criteria. The content is comprehensive and provides adequate depth and breadth in its description of categories. Its internal structure is logically congruent in its cross-classification and translation of diverse perspectives. It has high credibility and social utility in that it can be used to guide health-promotion research, strategic thinking, planning and practice.

Beattie's (1991) health-promotion taxonomy also offers theoretical plausibility. There are no internal inconsistencies or contradictions, and assumptions are compatible and mutually supporting. It offers coherence, clarity, comprehensibility, conceptual adequacy and logical development with clear statements about central contentions. It has explanatory adequacy and depth and it answers the call of Ellis (1968) for scope in being able to frame and integrate a broad number of concepts. Most importantly, Beattie's (1991) taxonomy passes the ultimate test of significance; its potential to guide research, planning and practice means that it has clinical usefulness. In addition, the taxonomy meets with Guba and Lincoln's (1989) call for its ability to accommodate new information and new levels of sophistication as they emerge.

Developing the methodology: mixed or muddled?

The following discussion on fundamental dichotomies that exist between the positivist and interpretative paradigms of social theory, positivist research and the interpretative paradigm as methodological context helps to illustrate the methodological perspective of the study. For Campbell (1981), there is no one, universal theoretical perspective but a number of positivist/interpretative divergent social theory positions. The first set are convergent with that of the natural sciences in seeking to establish interwoven objective, value-neutral causal explanations and generalisations. For the second, social reality is interpreted from the subjective meanings individuals give to their actions and perceptions.

The first divergency represents the fundamental dichotomy between the materialist and reductionist view of social reality and the 'idealist' view of the social world. With the former, society is viewed as composed of physical phenomena that can be understood and explained and whose actions can be predicted. In the 'idealist' world, social reality is constructed by human consciousness, perception and subjective interpretation, and its context and matter exist only as a form of projection of this consciousness, i.e. social reality exists only as mental phenomena. The descriptive–normative parameter is concerned either with describing society and its stated intentions or engaging in critical evaluation of social norms, behaviour and actual performance.

The individualistic–holistic continuum focuses on the contradictory theory of human nature/theory of society debate. Social phenomena in the form of the attributes, motives, intentions and actions of people are thought of as competitive, independent of social relations and individualistic, or as social, integrationist and cooperative. Allied to this is the conflict/consensus divergency concerned with the economic, political and social struggles inherent in the capitalist mode of structuring society versus social cohesion, stability, pluralism and interdependence.

In a similar vein to Campbell (1981), Burrell and Morgan (1979) and Guba and Lincoln (1989) advance schemes for analysing the assumptions underpinning social science. While the ontological dimension opposes nominalism and realism and reflects the idealist/materialist divergency of Campbell, the epistemological set of assumptions raises questions about what constitutes valid knowledge, i.e. whether it is positivistically derived, hard, real, objective and value-free with the researcher detached from the process, or soft and based on subjective interpretation of personal experience and insight. The human nature continuum sub-divides the belief that human nature is determined by, and is a product of, the social structure and the belief that it creates the social environment through exercising free will and self-determination.

The nomothetic/interventionist perspective seeks to understand the external, rational and concrete artefacts of the social world as fixed, ordered reality (Polit and Hungler, 1997). This is achieved by the application of tightly managed empirical methods of the natural sciences and traditional 'scientific' rigour. The goal is objective, value-free knowledge and unequivocal truths, and studies that can be replicated to reinforce findings. In contrast, the ideographic/hermeneutic (or naturalistic) stance stresses the relativistic nature of such phenomena and the co-existence of multiple truths. Here the emphasis is on eliciting understanding and expounding how the individual interprets, creates and modifies perceptions of social reality and the network of assumptions which shape subjective experiences and the meanings attributed to them.

The key issue here for Popper (1970) is that the positivistic research process is applicable equally to the natural and the social worlds. He contends that the difficulties of applying the methods of the natural sciences to the social sciences are differences of degree rather than kind, and he thus advocates a unity of method. Popper argues that if, when investigating human activity, the 'method of hypothesis' or 'hypothetical deductive method' (1970: 33) is followed, and deductive causal explanations are advanced and tested, then like the natural sciences the social sciences can also be 'scientific'. As such, positivism holds that research can generate laws of human behaviour akin to the laws of the natural sciences (Popper, 1970; Cuff and Payne, 1979; Harralambos and Holborn, 1990; Playle, 1995).

Positivistic study of the social world involves observing, objectifying and classifying phenomena. Popper (1970) and like-minded researchers reduce research participants to inanimate, measurable and comparable variables and objects of inquiry. The meanings, motives and feelings of individuals are irrelevant both because human behaviour is governed by environmental stimuli, and thus people respond in a predictable and consistent way, and because they exist only in an individual's consciousness and cannot be observed. This implies two things. First, that human behaviour is a reaction to stimulus and devoid of meaning (Harralambos and Holborn, 1990) and second, that this body of facts waiting to be discovered is independent of historical and social context (Tinkle and Beaton, 1983; Lincoln, 1992; Leddy and Pepper, 1993).

While the positivist paradigm is appropriate for the subject matter of chemistry or physics, people possess consciousness and this means that social inquiry requires a different type of method from traditional science (Harralambos and Holborn, 1990). As far back as 1981, Watson contended that positivism is as outdated and inappropriate for nursing as it is incompatible with the aims of the discipline. For Playle (1995), this incompatibility relates to the clash between positivism and the humanistic philosophy of nursing. The former also represents the powerful influence of medical hegemony which has defined what constitutes legitimate knowledge and which creates a potential barrier to developments in the art and science of nursing. Playle (1995) advocates a rehumanising of nursing research using holistic and person-centred processes that recognise that the researcher and researched bring meaning to an inquiry, acknowledges contextual factors and rejects the objectivist approach to nursing science.

The methodological stance of this study meant that it was compatible with the assertions of Watson (1981), Playle (1995) and Taylor (1993), who advocated the phenomenological method as a way of understanding the reality of nursing practice and the associated meanings. In line with the fundamental dichotomies discussed earlier, the adoption of a particular ontological position demanded convergence on the epistemology and methodology dimensions to preserve philosophical continuity (Guba and Lincoln, 1989). Analysing the study via the application of Campbell's (1981), Burrell and Morgan's (1979) and Guba and Lincoln's (1989) frameworks for social theory analysis to the qualitative phenomenological stance of the study firmly located it in the interpretative, subjectivist paradigm.

The problem here was that theory testing has traditionally been associated with positivistic research methods. These highly structured studies place a numerical value on, and seek to quantify, the relationship between phenomena using representative samples and invoke various ways of controlling for confounding variables (Layder, 1993; Morse and Field, 1996). However, this dominant epistemological standpoint and its 'definitive' methods of theory

testing have been challenged (Silva, 1986; Silva and Sorrell, 1992) in line with the postmodern position outlined by Miller (1997) in relation to nursing. Here, no single theory or narrative can claim dominance or to have captured absolute truth, because all are incomplete in a social theory world of multiplicities, indeterminancies, fragmentations and pluralities of small-scale situated knowledge influenced by cultures, traditions, values, ideologies and family life. Postmodern theorists reject grand narrative and call for a multiplicity of paradigms, theories and methods to reflect the complexity of the discipline. Thus, while positivism may see qualitative modes of theory testing as muddled methodology, the postmodern approach, acknowledging multiple truths, enables intellectual freedom while demanding methodological justification when choosing ways of theory testing (Silva and Sorrell, 1992). In line with Meleis (1985), this process included testing the degree of fit between the parent theory and the fieldwork findings and the adaptation and synthesis of appropriate theory for nursing via theory derivation.

Adapting/synthesising appropriate theory for nursing

While the degree of fit between the participants' voices and narratives and Beattie's (1991) taxonomy were not absolute in all cases, strong pragmatic and conceptual links were identified. The individual action perspective and the one-to-one interpersonal level of intervention aligned 'The Nurse as Behaviour Change Agent' and 'The Nurse as Empowerment Facilitator' from the fieldwork findings with Beattie's (1991) 'Health Persuasion Techniques' and 'Personal Counselling for Health'. All were concerned with the health-related knowledge, attitudes, behaviours and skills of individuals, and posit these to be the primary determinants of health status. Their individual focus of intervention involved the former in some form of health-related learning (Tones and Tilford, 2001) which may lead to attitude and lifestyle change, and the latter in enabling individuals to set their own health agenda (French, 1990). In operating from different belief systems, they invoke different aims, methods and outcomes and thus different indicators of success in terms of health gain. Similarly, the collective focus of intervention aligned 'The Nurse as Strategic Practitioner', 'The Nurse as Admission Avoidance Facilitator' and 'The Nurse as Advocate' from the fieldwork findings with 'Legislative Action for Health' and 'Community Development for Health' respectively. Both focus on population interventions, but operate from opposing ends of the power continuum and, in so doing, they also invoke different aims, methods, outcomes and indicators of success.

Re-configuring the format of Beattie's (1991) taxonomy to reflect the major themes and the deviant/paradigm cases with a patient population focus of intervention from the fieldwork findings enabled it to be considered as derived (as opposed to borrowed or developed) theory. Walker and Avant (1995) explain that theory derivation takes a theory (T1) from another field of inquiry (F1) and modifies, synthesises, redefines and restates concepts as required so that they fit with, and are meaningful to, the new field of interest (F2). This forms a new theory (T2) for the new discipline (F2). It becomes nursing theory, when the process of derivation and synthesis reconceptualises extant theory and gives new meaning to nursing phenomena and nursing problems from a nursing perspective (Meleis, 1985) or nursing frame of reference (Phillips, 1977).

The purpose and value of theory derivation is in enabling new insight to be gained and explanation to be given about phenomena that are poorly understood, insufficiently robust in terms of theory development or where there is a dearth of literature and formal study (Walker and Avant, 1995). It is not who developed the theory or where it was developed that matters; the crux is that it is being used to address nursing phenomena (Meleis, 1985). Theory derivation, then, intersects unique, generated theory (e.g. the fieldwork findings of this study) with borrowed theory (e.g. Beattie's (1991) health-promotion framework) and is the process of understanding phenomena in one field through analogy from another (Wewers and Lenz, 1987; Walker and Avant, 1995).

In line with Walker and Avant (1995), theory derivation was enabled by ensuring thorough familiarity with the pertinent literature and the level of theory development in nursing and other disciplines, and an evaluation of the relative merits of this work. As none of the former theory was fit for purpose then theory derivation was able to proceed. The selection of a parent

theory (Beattie's (1991) taxonomy) for derivation was outlined in its 'theory one, field one' format. The criteria for the selection of the parent theory included its ability to offer new insight into, and an ability to describe, phenomena of interest. The content and structure of the parent theory that was used and that was the best fit with the new field of interest was clearly identified and were modified, redefined and restated so that they were meaningful to, and fitted with, the new field of inquiry. Phillips (1977) emphasises that the theory cannot be simply transposed without being reconceptualised and synthesised from a nursing frame of reference.

Derived theory testing

Once reformulated into its new format, the derived theory was tested to validate the relationship between the new concepts and structure and the reality of the new field. While a necessary condition for theory testing to proceed was the explicit identification of a theoretical framework for research, such as the use of Beattie's (1991) taxonomy in this study, that in itself did not constitute the testing of theory. It was also not enough to name and summarise the theory and integrate it into the study or assume its underlying tenets were valid without providing evidence to support or refute it, as this contributes little to nursing knowledge or nursing theory development (Silva, 1986). Hence, the derived theory was verified further in two ways. First, the formative theory-testing criteria, modified for this study, of Silva (1986) were applied. Consistent with Silva's (1986) criteria, the purpose of the study was to test the underlying validity of an existing theoretical structure and this was stated as the framework for the research. The theory was discussed in breadth and depth so that its relationship to the study was clear and the study aims were empirically tested in an appropriate manner. As a result of the empirical testing, indirect evidence of the validity of the assumptions or propositions of the theory were provided and this evidence was discussed in terms of how it supported, refuted or explained relevant aspects of the theory.

Second, the analysis of the descriptions of personal experiences of nurses and their nursing practice from the fieldwork findings were used in line with the criteria for qualitative theory testing of Silva and Sorrell (1992). Thus the study sought to identify a relationship between the personal experience of nurses and the philosophical beliefs and assumptions that underpinned the established theory. The research question was based on an attempt to provide an elaboration of concepts related to developing the theory further and the data generated sufficient in-depth descriptions of personal experiences to capture the essence of the phenomena under investigation. Simplicity, ethical integrity and aesthetic presentation were integral characteristics of the described personal experiences and formative theory was derived inductively from qualitative analysis of the described personal experience. Multiple personal experiences of an individual and/or similar personal experiences of several individuals about particular phenomena were used to validate the derived theory. Data analysis and the degree of fit of the generated concepts with the personal experiences provided indirect evidence of the validity of the existing theory and the findings were discussed in terms of how they relate to the development of the extant theory. Finally, the developed and the extant theory used to frame the former were internally consistent and congruent with each other.

Conclusion

This paper on qualitative theory testing as mixed method derives from a research project that took place against a health and professional policy backdrop increasingly emphasising the health-promotion aspect of nursing practice and nurse education. The purpose of the study was to help to redress our poor understanding of this facet of hospital practice and to identify a theoretically robust taxonomy that, potentially, could be developed further as a tool to guide health promotion in nursing. The design was also mindful of Silva's (1986) concerns that numerous nursing studies have used conceptual models as research frameworks but few have tested the underlying validity of their assumptions or propositions. Silva attributed this to a lack of investigator commitment and saw it as an impediment to the testing of nursing theory. To offset this, internal theory testing criteria were applied to test the rigour and conceptual adequacy of Beattie's (1991) work to help justify it as the health-promotion taxonomy of choice for this study. However, the interpretative, subjectivist methodological

stance of the fieldwork study meant that it was incompatible with the orthodox view that associates theory testing with positivistic research methods. This dominant epistemological standpoint that a single worldview can capture absolute truth was rejected in favour of a postmodern position of a social theory world of multiple paradigms. Thus, while positivism may see the qualitative modes of theory testing used in this research as muddled methodology rather than as mixed method, the postmodern approach, acknowledging multiple truths, enables intellectual freedom while demanding methodological justification when choosing ways of theory testing (Silva and Sorrell, 1992) as illustrated herein. In addition, with regard to the latter, Tinkle and Beaton (1983) point out the contradiction of the positivist position for, while proclaiming objectivity and universality, positivism is itself a product of a particular social and historical context.

As a result of the methodological processes discussed, the study was able to demonstrate a clear relationship and fit between the fieldwork findings and Beattie's (1991) health-promotion taxonomy. This relationship, and the relationship of Beattie's (1991) taxonomy to nursing, was established further by the application of additional theory testing criteria to a modified version of the work to achieve theory derivation and thus tentatively advance it as a framework for conceptualising and contextualising nursing health-promotion practice

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Key points
- Mixed-methods research is usually associated with combining quantitative and qualitative approaches
- The mixed-methods approach outlined here involved theory testing(usually associated with quantitative research) using qualitative methodology and theory derivation
- The emphasis is on metatheoretical debate in relation to researching health promotion theory in nursing rather than the pragmatics of the research process

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