

## Mapping knowledge in chronic illness

Nancy M Dluhy PhD RN

Associate Professor, Director of Graduate Program, College of Nursing, University of Massachusetts Dartmouth, Old Westport Road, N Dartmouth, Massachusetts 02747, USA

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Theory-based nursing practice requires a systematically developed, integrated body of information to deal effectively with the complexities of the human condition. This philosophical research is founded on a complementary knowledge model, valuing diverse views. The burden therefore is on uncovering connections between perspectives. A method is proposed and tested for mapping pluralistic knowledge in chronic illness. Underlying the method development is the premise that all knowledge can be represented as different combinations of ontology (views of the person) and epistemology (nature and aims of science). Based on a review of over 300 references, six major themes (comprised of 20 conceptual categories) are uncovered in the nursing literature. Analysis of the map reveals the influence of trends as well as areas of minimal development (e.g. holism). A key advantage of mapping is the opportunity to know the data in a large substantive area and to begin to identify potential linkages for cumulation. Fatigue, pain, symptom management, day-to-day living with illness, and social support are identified as promising areas to begin building a mid-range theory of chronic illness. Developing a cumulative knowledge base narrows the gap between theory and practice.

### NURSING KNOWLEDGE

Nursing knowledge has exploded in recent decades, and nowhere is this more evident than in the field of chronicity. The literature reveals explorations into chronic illness based on diverse theoretical frameworks and research traditions, such as coping, physiological stressors, cultural diversity, self-care, uncertainty, and uncovering meaning in experience (Leidy 1989, Braden 1990, Anderson 1991, Mishel *et al* 1991, Breslin *et al* 1992, Kleinman 1992, White *et al* 1992, Robinson 1993). Recognizing the complexities of the human condition, nursing scholars have acquired fresh insights and interpreted research strategies stemming from biological, social, psychological, anthropological, interactional and existential perspectives. As a result, the state of the art in nursing science can be characterized as one of pluralism, reflecting the importance of diverse views. While some are adopted intact, the majority become blended or reconstructed, and translate into unique nursing perspectives.

A perception of nursing science is that this large compendium of information represents an integrated body of knowledge. A pilot inductive study designed to uncover a unifying thread in chronic illness disputes that conclusion (Dluhy 1993). For example, how does coping with illness systematically link to notions of stigma, social support, or quality of life? Connections between these separate and competing perspectives on illness remain unclear.

A body of knowledge that appears disconnected or unrelated severely hampers the practising clinician, who, on the basis of expert skills and authoritative information, intervenes in the care of individuals. To illustrate, an oncology nurse develops a strategy for maximizing the client's response to chemotherapy. In this situation, the approach depends not only on recognizing physiological changes but understanding the influence of support systems, emotional reactions, socio-economic impact, cultural meaning of illness, and the impact of nursing actions on the experience. Generally, when confronted with a disjointed set of facts, each nurse must determine

the appropriate connections among the many aspects of both chronicity (e.g. uncertainty, denial, coping) and illness-specific phenomena (e.g. pain, dyspnoea)

Knowledge linkages developed independently by the nurse are inadequate for a scientifically based practice, since the desired practice model would have to depend on interwoven scientific insights widely accepted within the discipline. Practice decisions require not only selecting between, but accommodating competing claims in attending to the complexities of the human condition. Unconnected sets of facts or theories cannot be adapted effectively to the practice setting.

### Issues in integrating knowledge

The intensity and level of specificity required by the researcher to focus in on the phenomenon of interest creates a barrier to integration. Blalock (1969, 1979, 1982) considers the control of variables as essential for research feasibility. They are held as constant (all things being equal) or as background noise to be ignored. Over time, researchers exploring even closely linked notions may simply talk past each other, generating unique vocabularies to explain their findings (Blalock 1982).

The result can be compared to the popular parable of the blind men describing the elephant. Each man touches a different part of the animal and proceeds to report his perceptions based on this limited field of discovery. One explanation relates to the rope-like nature of the tail, another to the hard smooth surface of the trunk, and still another to the thick solid nature of the elephant's body. Each view obviously offers an incomplete version. It is only when the individual observations of the blind men complement one another that the essence of the elephant can be understood.

Moulding a massive diverse body of knowledge into an intertwined whole requires more than simply adding disconnected facts. As Blalock (1979) asserts, the complex nature of the human condition suggests that phenomena need to be considered in relation to the impact of multiple variables and contextual circumstances. A unique, scientific approach is needed to uncover, analyse, and integrate valued yet dissociated ideas. Philosophers of science have recognized this activity as equal to, yet separate from, others that focus on generating new knowledge.

Movement towards this stage of knowledge development does not apply merely to nursing but also appears in contemporary sociology, psychology, organizational management, and social work (Eulberg *et al* 1988, Garrison 1988, Turner 1989, De Hoyos 1989). The state of amassing facts reflects an initial developmental stage in any science. Classic methods used in research and theory-building are inadequate, however, for the synthesis process. Unlike other theoretical activities, developing a cumulative body of knowledge requires searching for the

potential complementary nature of discrete frameworks. Rather than determining the 'best' explanation for a given phenomenon (competitive decision), this task involves determining the optimal fit between widely accepted frameworks (complementary decision).

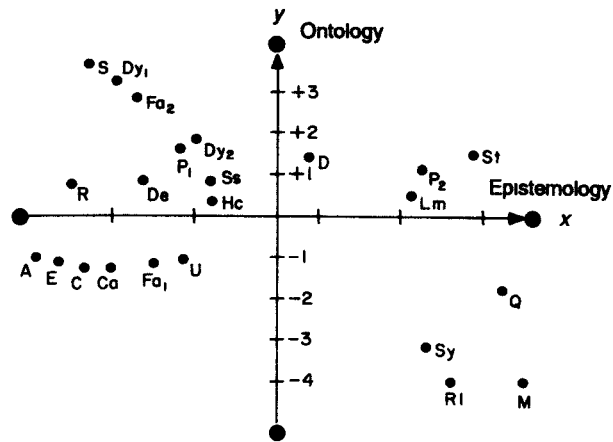
### DESIGNING A KNOWLEDGE INTEGRATION METHOD

The question of method may be simple but the answer is often problematic. What is the most systematic, efficient and rigorous means of describing all that is known and accepted in nursing related to the chronically ill client? No method fitting this criteria has been published. Yet, consistency of method with accepted modes of scientific discovery, theory development, and the goal of nursing knowledge is fundamental to achieving the desired outcome.

Utilizing the above boundaries, Figure 1 shows a map constructed by the intersect of two axes — nursing ontology and epistemology. Twenty diverse conceptual areas related to chronic illness, such as pain, fatigue, uncertainty and quality of life, are positioned or 'mapped' within one of four quadrants. Criteria related to ontology and epistemology provide guidance for positioning on the axes. A fuller understanding of the map requires a step-wise discussion of the decisions underlying this method.

### Literature

The literature reveals that a wide array of disciplines (e.g. biology, sociology, psychology, medicine, education, organizational management) has reported on efforts to reconfigure a large number of scientific claims into a unified representation. On analysis, the examples described can be classified into four categories: (a) codification, (b) synthesis as an interpretive activity, (c) dialectic methods, and (d) structural methods. Serious shortcomings, however, appear with each example, including a lack of specificity in method, limited recognition of philosophical variations within science, lack of scientific rigour, and esoteric discussions with minimal evidence of potential for application. Not directly applicable (although influential in constructing a new method) are the scholarly works of Moreno & Glassner (1982), Becker & Maiman (1983), Ward (1983), Sternberg (1985), Berger *et al* (1988), Kalmar & Sternberg (1988), and Rakover (1989). Of particular significance is the research programme of Blalock (1969, 1982, 1984, 1989) on theory development and the substantive area of minority relations. His writings provide a sound foundation with regard to (a) selecting a finite number of variables deemed important to the discipline, (b) identifying the goal of balancing parsimony and complexity in theory-building, and (c) acknowledging the



**Figure 1** Map of chronic illness knowledge in nursing  
 A, attribution, C, control/mastery, Ca, coping and adaptation, D, disability, De, social definitions, Dy1, Dy2, dyspnoea, E, emotional response, Fa1, Fa2, fatigue, Hc, relationship/health care provider, Lm, life management, M, meaning in illness, P1, P2, pain, Q, quality of life, R, roles/transitions, Ri, redefining illness, S, stress adaptation, Ss, social support, St, stigma, Sy, symptoms, U, uncertainty

#### Criteria for +3 Level Placement

Ability to control or be controlled	Nature of person mind/body/soul
<ul style="list-style-type: none"> <li>• All things (physical, human) subject to external force of nature</li> <li>• Human experience can be reduced to matter and motion</li> <li>• All individuals are bound by a common reality</li> <li>• Antecedent causes = genetics, instinct, environment, experience</li> </ul>	<ul style="list-style-type: none"> <li>• Person defined as physical entity (substance, observed behaviours)</li> <li>• Person as animal, behaving machine</li> <li>• Thinking viewed merely as stimulus response to physical change</li> <li>• Seen in behaviourism, ethnology, psychoanalytical perspectives</li> </ul>

assumptions (both measurement and conceptual) that underlie all knowledge. Blalock's (1982) repeated contention that theoretical endeavours evolve from a position of compromises, energized by the goal of moving on, provides the validation to resolve thorny theoretical concerns.

The final level of method development requires identifying significant theoretical issues in nursing. It is critical to transcend a merely philosophical or theoretical exercise and to provide a mechanism for moving towards theory-

based nursing strategies. Kim's (1989) five-tier framework, which systematically analyses theoretical thinking in nursing science, supports this process. It confirms the necessity of eventually merging pluralistic views, by extrapolating from the philosophy of science, knowledge generation and research strategies, and the foundational assumptions of the various sciences of human phenomena.

#### Pluralism in nursing

The model for mapping the diverse, widely held notions related to chronic illness is therefore founded on the roots of pluralism in nursing, a perspective that entails the 'integration of mind and body interacting and being interdependent with the environment' (Suppe & Jacox 1985). Disciplinary commitment to the essential phenomena of nursing requires attending equally to physical, cognitive, mental, social and interactional experiences. While holism prevails in nursing philosophy, the dominant modes of discovery still focus on one isolated or particular aspect of the human condition.

Pluralism primarily revolves around two dichotomies: objective/subjective and mind/body. A new method must additionally address the philosophical concern related to the incommensurability or assumed incompatibility between such dichotomous premises basic to developing knowledge.

#### GENERATING A METATHEORETICAL MAP

In essence, a premise is set forth stating that the varied knowledge related to chronic illness can be divided into differing views of the person (ontology), and the nature and aims of science (epistemology). Ontology is subdivided into views of the person's ability to control or be controlled by the environment, as well as differing configurations of mind/body/soul. The intent of the method, therefore, revolves around presenting a complementary rather than an exclusionary map of knowledge. Garrison's (1988) understanding of the principle of complementarity indicates that any single perspective provides an incomplete picture of reality. In a complementary view, the burden is on uncovering connections between perspectives, and identifying conditional states.

From this initial premise it is possible to construct a representation from the intersect of these dimensions. Varying ontological and epistemological viewpoints form strong dichotomies. For example, science is conceived within realism (truth) or relativism (interpretation). Yet, between these polarized reference points, a continuum of varying degrees of modified, less restrictive, interpretations exists. Therefore, developing the simplified map into a useful mapping method requires setting the extreme or dichotomous views as anchoring poles. Continuums of ontology and epistemology can then be constructed by

positioning modifications of these extreme orientations in relation to their similarity to the anchoring poles

It should be noted that placement does not represent an exact interval but rather the relative position between differing views. Figure 2 shows an abbreviated view of the anchoring poles along each axis. Specific criteria, developed by Dluhy (1993), define each level of the ontology and epistemology.

### Mapping process

Criteria for placement along the continuums provide the means of mapping knowledge on a single four-quadrant plane created by the intersect. Locating a body of knowledge at one single point requires an analysis of associated literature and determining the best fit with these criteria. It is useful to remember that every single point on the map represents many collective programmes of research and theory development initiatives, focused on one primary concept or framework and sharing a similar perspective of the world.

The process, which entails a marked variation on conceptual analysis, is founded on Kuhn's (1970), Moreno & Glassner's (1982) and Kalmar & Sternberg's (1988) notions of the potential to translate between widely differing frameworks while maintaining the core of the knowledge. Dluhy (1993) cites the following steps in the process:

- 1 Identify all developed knowledge within nursing related to chronic illness, requiring extensive familiarity with this substantive area.

- 2 Analyse for core aspects of each knowledge area based on the originating theoretical perspective or scientific framework.
- 3 Map the knowledge core on the grid, based on criteria governing each location.
- 4 Highlight central tenets of these individual conceptual areas to establish potential commonalities and linkages between points.

Coping and adaptation studies in chronic illness provide a prime example of the above steps. Fundamentally, all work in this arena emerges from some version of the seminal work by Lazarus (1966). He emphasized cognitive or information processor views of the person and the use of measurement scales of emotional responses (neopositivism). Therefore, this large body of research, theorizing, and nursing strategy development related to coping and adaptation is located at a single point (-1, neopositivism), and surrounded by similar traditions in frameworks of control and mastery, uncertainty, and a less dominant, non-physical perspective found in fatigue studies.

### THE CHRONIC ILLNESS MAP

An awareness of knowledge development in chronic illness helps to determine conceptual areas to be included. Research in this area traditionally targets specific illnesses (cardiac, cancer), a unique aspect of illness (pain, progressivity), an illness-related response (coping, uncertainty), social consequences of illness (stigma, disability), or more global chronicity experiences. A rich array of information can be accessed using computer searches and ancestry techniques to identify influential works. Since the map is intended to reflect widely accepted views on

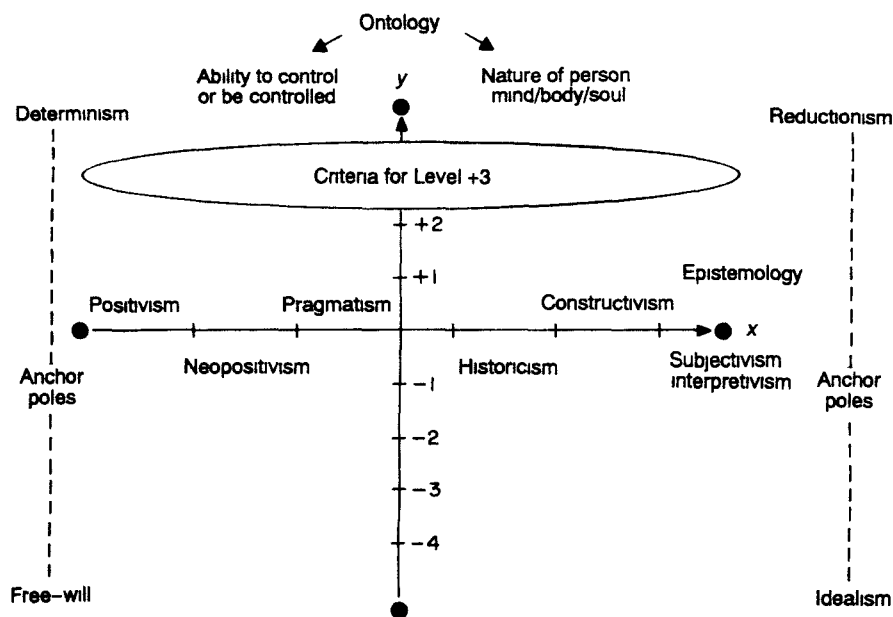


Figure 2 Anchoring poles and illustration of +3 placement

chronic illness in nursing, disseminated knowledge is the preferred database. Thus, an adequate search addresses both global and specific aspects of chronic illness published in recent literature.

In the present study, over 300 research and theoretical references relating to multiple areas of chronic illness were reviewed, analysed, grouped into common themes, and mapped. Twenty conceptual areas can be identified in the literature. These broad areas cluster within six emerging themes (Table 1). All knowledge cores are adequately accommodated using the method detailed, and occupy each of the four quadrants. The map provides a visualization of all that is known in this arena.

Large bodies of knowledge represented in this way make it feasible to develop a novel mode of analysis. Questions that can be addressed include the following:

- 1 What factors within the discipline have promoted the development of clusters or the exclusion of other areas?
- 2 Are there potential linkages or critical bridges between these large knowledge bases?
- 3 How can one translate from the language of one cluster into another?
- 4 What new questions arise when viewed in this manner that might have implications for promising explorations into interventions?

An analysis of commonalities among the four quadrants provides a fresh perspective on developing chronic illness knowledge (Figure 3). Quadrant 1, bounded by reductionism and subjective interpretivism contains few themes, a finding not unexpected since these anchor perspectives are highly incongruent. Elements of the 'social person' reflecting a somewhat deterministic framework are

scattered in this quadrant. In particular, the constructivist traditions exemplified by Strauss & Glaser (1974) dominate.

Bounded by reductionism and positivism, quadrant 2 features a large number of conceptual themes, with the physical components of illness predominantly clustering in this area. This is predictable since most of the research on physical aspects has emerged from the biological and medical sciences. A positivistic stance seeking causation becomes a major contributor to investigations of physical symptoms associated with chronic illness. In this quadrant, Selye's (1976) model of stress-adaptation has been used frequently as the explanatory base.

A large cluster in quadrant 3 signifies the pervasive influence of the 'cognitive model' of person from psychology. Even though these concepts often relate to emotional states and thought processes, the foundational frameworks stress quantitative, artificial research designs, operationalism, and causation. Concepts are developed with strong emphasis on the significance of the person's perceptions, although consistently measured and interpreted from an outsider's view. Physical aspects of chronic illness form a backdrop but rarely become salient. The influence of the Lazarus (1966) model of coping and adaptation dominates this quadrant and, to a large degree, chronic illness literature. This point is well demonstrated by an ancestry analysis identifying the influence of seminal works.

In the final quadrant, bounded by subjective interpretivism and idealism, the most holistic, existential notions of chronic illness cluster. Traditions in sociology, anthropology and philosophy generate the methods that influence this area, but no one scholar exemplifies this quadrant. While nursing scholars philosophize about the movement towards holism, of interest is that few themes appear in this view of person.

**Table 1** Themes and concepts in chronic illness

Themes	Conceptual areas
1 Demands and challenges	Fatigue, dyspnoea, pain, uncertainty, stress/adaptation
2 Emotional and cognitive responses	Defence mechanisms, control/mastery, coping/adaptation, attributions
3 Day-to-day tasks of living with illness	Life management/normalizing symptoms
4 Being chronically ill in the culture of a 'healthy' society	Roles/transitions, disability, stigma, social definitions of illness
5 Changing interactional patterns with family and health care providers	Social support, relationship with health care providers
6 Potential life outcomes	Quality of life, meaning in illness, redefining the illness situation

### Significant discoveries

Further analysis of the map reveals some significant discoveries. As an example, quality of life, as discussed conceptually, appears to stress the holistic view of the person. Measurements of quality of life, however, are more frequently positivistic in nature. Still, the concept is positioned at the level of holism (-2) since research efforts consistently express frustration at not being able to capture the essence of quality of life. Measurement efforts seem to reflect a lack of adequate instruments (in the most global sense) rather than a commitment to a more reductionistic view of quality of life.

Generating a knowledge map of chronic illness is not intended as an end point but rather as the first step in developing a systematic, cumulative body of knowledge. Therefore, the next analytical step is identifying potential bridges or linkages between conceptual areas. Each of the

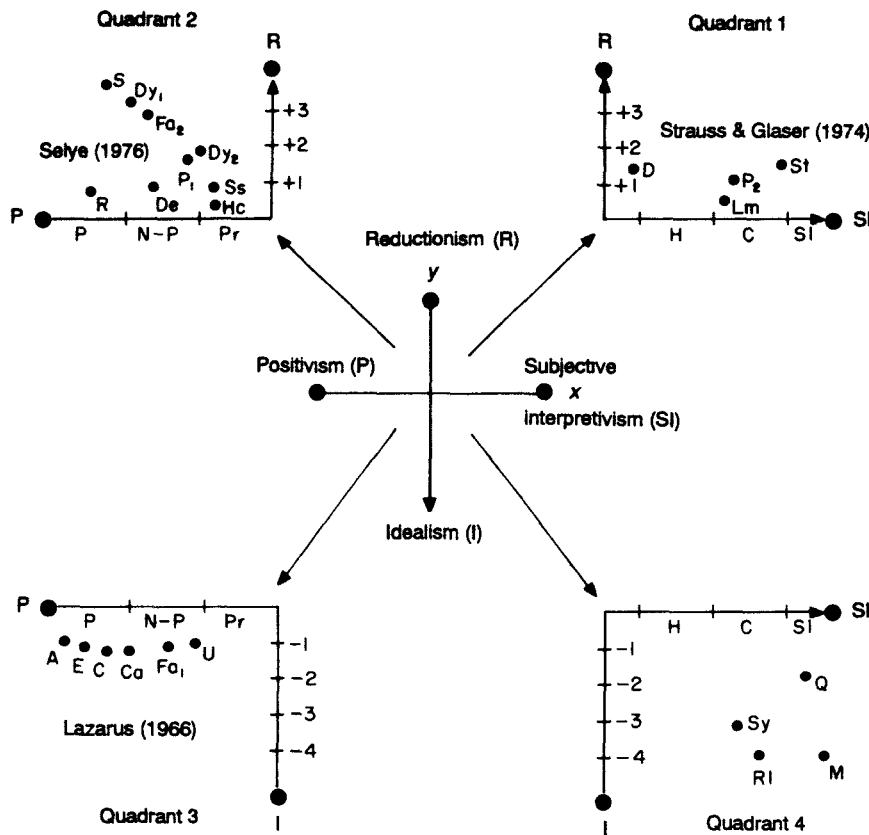


Figure 3 Concepts and influences within quadrants

20 concepts was subsequently developed linearly in relation to (a) causes of the phenomena or explanatory theories, (b) the phenomena's effects or associations with other aspects of the chronic illness, and (c) suggested strategies for dealing with the phenomena

This approach stimulates a visual sense of the development of each conceptual area and the emphasis on either explanatory, effect or strategy aspects. Potential commonalities also become apparent across themes with this level of analysis. Some concepts appear in more than one of the six themes, such as social support, fatigue and symptom management. Those reflecting a higher frequency, or in multiple themes, are marked as likely bridging concepts and warrant further focused examination.

Additionally, physical symptoms (specifically fatigue and pain), symptom management, and day-to-day life management, are hypothesized to be conceptually related bodies of knowledge, yet when mapped, they occupy all four quadrants. A more concentrated inquiry into the knowledge generated in these separate areas represents a highly promising next step in a research programme based on mapping analysis. Uncertainty and control, other frequently cited elements of illness, might offer further means of bridging the gap between the cognitive, physical and experiential aspects of illness.

Important to note is the preponderance of information

related to causal explanations of the conceptual areas, with a paucity of data discussing the effect of the concept on other aspects of chronic illness. Another observation is the notable lack of information stressing the development of strategies to deal with the problems associated with chronic illness. Clusters of concepts are evident and appear representative of dominant trends in the social and behavioural sciences. For example, a large cluster is identified with the notion of the cognitive person. The completed map highlights the potential for further exploration and expansion of less prevalent, although scientifically developed, knowledge bases. Viewing knowledge as complementary, there appears to be a sense of imbalance in development. To illustrate further, physical dimensions of chronic illness have been under-represented while cognitive aspects dominate the themes.

### IMPLICATIONS FOR NURSING

Pluralism in nursing will continue as long as knowledge related to the physical nature of persons (drawing on biology and medicine), as well as their emotional and cognitive nature (adapted from psychology and the humanities), remains of significant interest. Meleis (1991) notes that there are no indications that varying ontological and epistemological perspectives are merging into a singular

framework within nursing. It is argued, therefore, that new methods must be developed to integrate these highly diverse views into a sound theoretical basis for nursing.

One suggested method, that of metatheoretical mapping, provides a useful strategy for accommodating all relevant knowledge in chronic illness and for beginning to construct the framework for a mid-range nursing theory in this area. A key advantage with such an approach is 'knowing the data' in relation to all other associated data. Although recognizing that this method may not be the only one to accomplish the goal of cumulating knowledge in the area proposed, it is one way to break out of the 'conceptual ruts' described by Wicker (1985). This framework puts forward an interpretive reconstruction of the knowledge within chronic illness — a theoretical work in progress.

The outcome of metatheoretical mapping is the ability to represent and simultaneously view all knowledge of a substantive area, resulting in a sense of scholarly control. What ensues will be an important outcome in which possible linkages between knowledge can be discovered that otherwise might appear counter-intuitive or hidden. An example is uncovering possible connections between loosely defined areas of symptom management, fatigue, pain, and day-to-day living with chronic illness. These areas may now be re-examined to seek new linkages and interpretations while recognizing the potential dominance of coping models.

Implications for further development in chronic illness can be drawn from the mapping analysis. An overview noting the clusters of concepts graphically portrays the continuing commitment to positivistic, mechanistic approaches in nursing, despite philosophizing to the contrary. This observation tends to suggest the need for more development within relativistic frameworks. Yet the additional analysis of explanatory frameworks, effects and strategies associated with each conceptual area, highlights the difficulty of systematically developing nursing strategies from knowledge derived within subjective frameworks. These two views suggest the ongoing need for maintaining balance, uncovering linkages, and adhering to the goal of knowledge utilization in the cumulation process.

### Identifying key variables

Additionally, the use of scientific knowledge in chronic illness for practising nurse clinicians points to the need for further simplification by identifying a small number of key variables that may be exerting a multiplicative effect on other dependent variables. This step is necessary before moving towards nursing interventions and outcome studies, since essential conditional states must be identified. One conditional or contextual factor that emerges in analysing chronic illness is time. While it represents a highly significant variable in most chronic illness themes, the

time element has been difficult to incorporate adequately into traditional investigations to date. This conclusion suggests that thoughtful designs should be introduced that will incorporate this dimension while exploring bridging links in the model.

Through the mapping process a system of checks and balances in knowledge development will evolve. This activity is particularly critical in the light of the complexities of human nature, as well as the prevailing theoretical fads that might obscure other essential aspects within this area. Checks and balances also provide a mechanism for reducing and simplifying large numbers of variables that are conceptually similar. Furthermore, they tend to afford some translation between seemingly diverse notions.

Some difficulties have emerged with this approach. Researchers are apt to reference nearly every foundational knowledge base related to chronic illness. Citations thereby offer little guidance as to the central perspectives underlying the work under consideration. A more discriminating review, however, proved that the majority of references were superfluous, while one scientific tradition formed the real research thrust. The actual research design, rather than the author's discussion of perspective, provided the most revealing information on ontological and epistemological values.

### Future directions

The greatest problem has been in determining central tenets reflecting any degree of intersubjective agreement. In particular, it is no simple task to discern those assertions routinely reported but not systematically investigated from scientifically supported beliefs related to a particular concept. Of greater concern is that many unfounded assertions appear to form the foundation for the next generation of research studies, and therefore compound the problem of intersubjective agreement. Recognition of this troubling issue strengthens the need for ongoing metatheoretical examinations in large substantive areas of inquiry.

The mapping process for cumulating knowledge requires extensive grounding in a substantive area — in this case chronic illness — as well as the science of knowledge development and utilization. A team research strategy might optimize this approach. Scholarly dialogue among theoreticians skilled in the philosophy of science would aid in identifying assumptions, validating placement on the map, and generating creative researchable hypotheses. Caution, however, is advised in a group-think approach, which might interfere with conceptualization during the more formative stages of theorizing.

### CONCLUSION

A metatheoretical analysis represents a viable means of generating a more sophisticated level of theory, simply by

exposing the core elements, underlying assumptions, and posited relationships to other developing knowledge areas. While this method has been tested for chronic illness, it can be adapted to any client level knowledge base of varying scope, e.g. pain, anxiety, life transitions, women's health, developmental notions, or gerontology.

For any substantive area relevant to practice, it appears that there is an appropriate point when this type of assessment is essential for gaining critical insights into knowledge development. Increased understanding of the linkages between the most fundamental concepts relevant to nursing practice narrows the gap between theory and practice. A systematically derived, complementary knowledge base will ultimately lead to refinements in practice research. This level of inquiry is mandatory for achieving the goal of demonstrating outcomes for a theory-based practice discipline.

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