TOWARDS A GENERAL SYSTEMS THEORY OF NURSING: A LITERATURE REVIEW

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ABSTRACT

Although systems thinking in nursing is a vital tradition there have been no previous attempt to understand this systemically. This paper addresses nursing as a disciplinary matrix by systematic reviewing the relevant literature. The search engine 'CINHAL with Text' 1990-2011 is used along with a search of foundation and primers texts. There are both first-order homeostatic and second-order dynamic and to a much more limited extent third-order social contextual cybernetic systemic theories in the nursing literature. The development of nursing theory over time resulted from the personal perspectives of the nurse theorists, for example, Martha Rogers (1970), rather than phases of development. The practice development of family systems nursing, developed by Wright and Leahey (1984) and Marie-Luise Friedmann (1989) arose through international academic-practitioner networking. The systemic nursing management literature demonstrates open systems, complex adaptive systems and chaos theories. The literature reviewed suggests systemic ideas arose to address the problematics of specific domains. Specifically, the problematic of professionalization resulted in the development of systemic nursing theories in the academic domain and family systems nursing in overlap between the practice and academic domains, and the problematic of cost-containment and risk management in the governance and government domains. There is limited connection between systemic thinking by nurses in the largely domain specific literature. The conclusions of this review are that: first, there appears to be some consensus about the value of attachment (Bowlby 1951) and ecological developmental theories (Bronfenbrenner 1979) in nursing practice: and secondly, the slow development of nursing as an academic project can be viewed as an opportunity for transdisciplinary considerations of biological, psychological, sociological and political systems in nursing theory and practice. This paper is an expression of an attempt to address the puzzle of considering the coherence of systemic thinking in nursing from the author's position as academic and practitioner. The potential for developing a general systems theory of nursing practice, nursing administration, healthcare administration, and global healthcare remains, and may be of value in positioning the profession's practices in its policy and political environments.

INTRODUCTION

'And what nursing has to do.. is to put the patient in the best condition for nature to act upon him' (Florence Nightingale 1860)

Florence Nightingale, one of the founders of modern nursing defined nursing in 1860 as " an act of utilizing the environment of the patient to assist him in his recovery"

(Nightingale 1980). This required the nurse to 'configure environmental settings appropriate for the gradual restoration of the patient's health'...to effect positive biologic and physiologic processes (Craven and Hirnle 2003:580. The Nightingale tradition of nursing theory and practice thus positions the nurse as a professional who ensures a fit between an individual's biology and their material environment. This early definition of the nature of nursing proved a suitable context for the later modern development of nursing theory. The result of this was that 'systems thinking has a rich tradition in nursing', according to Holden (2005:655), dating from the late nineteen-fifties (Holden 2005:655). Despite this, the depth and detail of systemic of this tradition is regrettably overlooked both by those within and outside the field of nursing. This paper seek to address this by systematically reviewing the systemic nursing literature.

In a consideration of chaos theory in nursing, Coppa (1993:990) argues for the application of Thomas Kuhn's (1970:182) concept of 'disciplinary matrix' to nursing science and the activity of nurse scientists rather than the application of Kuhn's concept of paradigm. She argues for a historicist consideration of the 'flux' of 'symbolic generalisations, exemplars and models' in the disciplinary matrix (1993:990). Partial paradigms, 'whole paradigms' and even 'metaparadims' (Fawcett 1984) of nursing of the nursing disciplinary matrix, for Coppa, are best studied within this flux. This historicist approach to the evolution of systemic theory and practice is adopted in this paper.

A systematic approach to nursing literature is adopted. The paper commences with a brief consideration of general systems theory. The search strategy is then outlined. The paper is in three parts: firstly, developments in nursing theory are considered drawing upon compendiums of nursing theory, secondly, developments in nursing practice are considered drawing upon research, thirdly, recent resumes of the state of nursing knowledge are considered drawing upon nursing primers. The paper concludes with a consideration of the evolutionary flux of the disciplinary matrix of nursing.

GENERAL SYSTEMS THEORY

Ludwig von Bertalanffy (1950), born in 1901 died in 1972, argued for investigation into 'dynamic interaction' into the internal and external 'relations of organisation' across various scientific disciplines, for example, biology, psychology, sociology and economics. Von Bertalanffy contrasted closed systems with constant components without inflow and outflow, and open systems changing components with inflow and outflow. Closed systems were steady due do the constancy of components and closure, whereas open systems could achieve a 'steady-state' within constant change. Von Bertalanffy sought to describe various methods of change. Firstly, there was external direction towards a required final state. Secondly, there was internal structure determining processes and outcomes. Mechanistic feedback mechanisms regulating homeostasis were given by him as examples of this. Thirdly, there was open system interaction between organism and environment resulting in a steady-state. Fourthly, there were intelligent purposive processes and outcomes. The use of language was given by him as an example of this. Von Bertalanffy's (1950) early statements upon general systems theory are worthy of close reading since these various strands of systemic

thinking were later picked up and elaborated by others. Furthermore, this close reading of early primary sources attenuates against overstatements of the. Paley (2007:236) usefully notes that in the healthcare field there is little appreciation of their similarities and dissimilarities of various systemic theories, and that this results in much confusion.

Search Strategy

The author combined three search methods. First, the author consulted two compendiums of nursing theory (Meleis 1985) and Tomey and Alligood (2002). This ensured early disciplinary developments before the growth in academic nursing journals was duly considered. Secondly, the author used the 'CINHAL with Text' search engine for the keywords:, nurs* and 'system* theory', 'complex adaptive systems', 'complexity' and 'chaos'. This ensured the research evidence based for nursing was considered. Thirdly, the author consulted three readily available primers for the nursing specialities: mental health nursing (Kirkby et al 2004, Barker 2009 and Norman and Ryrie 2009), children's nursing (Coleman et al 2007, Coyne et al 2010 and Glasper et al 2010), learning disability nursing, (Marwick and Parrish 2003, Turnbull 2004 and Peate and Fearns 2006), and adult nursing (Baillie 2009, Clarke and Ketchell 2009, Creed and Spiers 2010). This ensured that the nursing knowledge considered proper for novices was considered. This combination of search methods hopefully ensured that the disciplinary matrix was considered in both breadth and depth.

PART 1: SYSTEMIC NURSING THEORY

There are three overlapping phases in the development of modern nursing systemic theory. First, biopsychosocial homeostatic nursing theories. Second, information and interaction morphogenic nursing theories. Third, field of consciousness nursing theories. These phrases are not fully sequential. It should be noted that the adoption of systemic theory by nurse theorists is often understated, especially in more recent work, because there are overriding concerns about demonstrating the uniqueness of nursing knowledge.

Homeostatic nursing systems theories

One of the earliest modern attempts to develop nursing theory, from the late 1950s onwards, was by Dorothy Johnson (1919-1999), a paediatric nurse. The person is a behaviour system, for Johnson, with attachment-affiliative dependence, achievement, sexual, aggressive-protective, ingestive, and eliminative subsystems. These subsystems had goal, set, choice and behaviour components. The 'system and subsystem remain self-maintaining and self-perpetuating as long as internal and external conditions remain orderly and predictable' (2002:2550. The person is an open system, linked to family systems and the larger social system (Brown 2002:254). Johnson's work draws upon John Bowlby's 91952) work upon attachment. She also draws 'heavily' upon systemic sociologists Talcott Parsons and Walter Buckley (Brown 2002:251 and Meleis 2002:276).

Johnson defines the goal of nursing as to 'restore, maintain or attain behavioural integrity, system stability, adjustment and adaptation, efficient and effective functioning of the system' (Johnson 1980:214 cited in Meleis 1985:274). Therefore, Johnson defines the

focus of nursing practice as 'an external force acting to preserve the organisation of the patient's behaviour by means of imposing regulatory mechanisms or by providing resources while the patient is under stress' (Brown 2002:254). Meleis (1985:276) views Johnson's theory, with its emphasis upon regulated balance between interdependent functional subsystems within a system, and the control of any equilibrium, as an direct application of Bertalanffy's general systems theory to nursing theory. However, it would be usefully to note that Johnson emphasises the homeostatic rather than morphogenic aspect of general systems theory.

Sister Castilla Roy (1939-present), a paediatric nurse, built upon Johnson's systemic nursing theory. The person is a bio-psycho-social system, for Roy, which adapts to the environment through the use of two subsystems of adaption. The regulator subsystem is based upon the neural, endocrine and perception-psychomotor systems. The cognator subsystem is based upon symbolic meaning. Roy placed much greater emphasis upon values, meaning and purpose than Johnson. These two subsystems are involved in meeting physical needs through the 'physiological-physical mode', defining self-concept through the 'self-concept-group mode', assuming responsibilities through the 'role function mode', and developing relationships based on integrity through the 'social interdependence mode'. Roy defines the goal of nursing as the 'promotion of adaption for individuals and groups in each of the four adaptive modes thus contributing to health, quality of life, and dying and dignity (Roy and Andrews (1986:19 cited in Phillips 2002:274-5). Roy has a more balanced consideration of stabilizing and regulation functions and growth and innovation functions (Meleis 1985:278) than Johnson. Nevertheless, equilibrium remains important to her work (Meleis 1985:287). The focus upon self-concept and role functioning derives from the sociologist Ralph Turner, according to Meleis (1985:286). However, the structuralist-functionalist approach of the sociologist Talcott Parsons is also evident in her work.

Johnson and Roy both address interdependent functional biological, psychological and sociological subsystems within a human system, and locate this within a wider social system. They both emphasise the maintenance of equilibrium. General systems theory is applied to directly to nursing theory, and also indirectly through sociology.

Dynamic nursing systems theories

Imogene King (1923-2007) (1971, 1981) starts with the assumption that 'nurses as human beings interact with patients as human beings, and both are open systems' who also interact with the 'societal social system' (Meleis 1985:327-8). King defins nursing as '"a process of human interaction between nurse and client whereby each perceives the other in the situation and, through communication, they set goals, explore means, and agree on means to achieve goals" (King 1981:144 cited in Meleis 1985:330). Meleis (1985:333) usefully discerns the influence of Herbert Bulmer's and G. H. Mead's symbolic interactionism, in addition to Turner's sociology of role upon King's theory. King seeks to understand 'complex dynamics of human behaviour between personal systems, interpersonal systems and societal systems (Sieloff 2002:339).

Betty Neuman (1929-present), a community mental health nurse, developed a 'systems/stress' theory of nursing (Meleis (1985:296). The person is a system, for

Neuman, that comprises core and peripheral physical, psychological, developmental and spiritual subsystems. This system seeks to defend itself against the threats or attacks of external stressors through protective lines of resistance. Betty Neuman defined a dynamic 'created environment' that exists between the internal and external environment (Meleis 1985:298). There is an emphasis upon perception, specifically, the part played by both the nurse and the patient in creating a shared 'perceptual field' (Freese 2002:305). Neuman seeks 'system stability that is higher or lower than the previous state' through an active process of 'reconstitution' (Meleis 1985:295) of the dynamic 'created environment' that exists between the internal and external environment (Meleis 1985:298). In the former case, this is 'negentrophy', progression towards wellness, and in the latter case 'entrophy', depletion or death. Neuman defined the goal of nursing as system stability and wellness (Meleis 1985:297). Although not identified by Meleis, the influence of Prigogine's (1980) ideas on dissipative systems are evident in Newman's work. There is an emphasis upon shared meanings and actions in an interpersonal field in both Neuman's and King's theories of nursing.

King (1971) and Neuman (1982), have a greater emphasis upon dynamic equilibrium in contrast to homeostasis than earlier nurse theorists. They contrast with earlier nursing theories in their focus upon the emphasis upon the field created by nurse and patient together. The nurse is no longer the detached observer of the patient, but rather a participant within perceived patterns. This could be compared to a similar shift, from homeostatic first-order family therapy to second-order family therapy that followed ten years later (Dell 1982). However, the overt consideration of social systems suggests a comparison with third-order family therapy is potentially more appropriate.

Unitary nursing systems theories

Martha Rogers (1914-2007), in one of the most early and original modern statement of nursing, published in 1970, defined the person as 'an open system in continuous process with the open system that is the environment' (Gunther 2002:229). People and their environment are 'irreducible energy fields integral with one another and continuously creative in their evolution' (2002:229). The goal of nursing is to 'strengthen coherence and integrity of the human field and to direct and redirect patterning of the human and environmental fields' (Rogers 1970:122 cited in Meleis 1985:313). Rogers drew upon developments in von Bertalanffy's General Systems Theory to challenge the earlier emphasis in nursing upon 'homeostasis' in closed systems (Gunther 2002:228). Specifically, Rogers introduced the terms of 'negentrophy' and 'entrophy' (Gunther 2002:226) within open systems into nursing studies. This forms the basis of 'helicy' defined as 'continuous innovative, probalistic, increasing diversity of human and environmental field patterns characterised by nonrepeating rythmicities' (Meleis 2985:316). Meleis (1985::316) and Gunther (2002:228) argue that Rogers' theoretical development of nursing was a precursor to the later development of chaos theory. Rogers' model can readily be seen as more 'abstract' (2005:656) than its precursors. However, she guides nurses towards the practicalities of the mutual exploration of pattern, the creation of new patterns, and then their shared evaluation (2005:233).

Rosemarie Rizzo Parse (1981) developed a model of human becoming drawing upon Martha Rogers' theory of nursing combined with existential-phenomenological

philosophy. Parse states: 'The human is enabled and limited by the human-world dialectic through which situations come into being. The human is in mutual process with the various views of the world and others, and indeed cocreates these views by a personal presence (Parse 1998:17 cited in Mitchell 2002:529). The nurse can uncover personal values and meanings and assist in the forward movement of 'cherished hopes and dreams' (Parse 1993:12 cited in Mitchell 2002:535). In this sense, human becoming is a process of the 'emergence' of consciousness (1998:15 cited in Mitchell 2002:535).

Margaret Newman (1933-present) (1986) addressed health as expanding consciousness. In common with Martha Rogers, she argued that the nurse 'facilitates pattern recognition in clients by forming relationships with clients at critical points in their lives and rhythmically connecting with them in an authentic way' (Witucki 2002:584). Pattern is defined as 'information that depicts the whole, understanding of the meaning of relationships at once' (1986:13). She views illness as a disruptive event that triggers disorganisation and then re-organisation into higher level of organisation, drawing upon Prigogine et al (1980). Newman defines consciousness, drawing upon Capra (1982) and Bentov et al (1978) as the 'informational capacity of the (human) system to interact with its environment', and argued that illness was an opportunity for expanding consciousness.

Rogers, Parse and Newman define themselves as shifting beyond systems theory towards the study of the study of the social emergence of consciousness. However, the extent of use of systems theory was sufficient for Friedemann to develop a 'Systemic Framework Theory of Nursing' in 1995 by combining the work of Martha Rogers, Imogene King and Margaret Neuman. The focus for Friedemann is upon congruence, as it is for Rogers. This is defined as: 'congruence is the ideal situation of all systems: a dynamic state in which system patterns and rhythms are in harmony with each other and with the universe (Friedemann 2002:327). The aim of nursing, for Friedemann is to assist families in their attempt to establish 'congruence with their own systems and (with) the larger systems of which they were a part' (Friedemann 2002:329). Nevertheless, there is some novel emphasis upon consciousness in the work of Rogers, Newman and Parse that shared similarities to developments in post-Milan family therapy in the early 1990s, influenced by the theoretical biologist Humberto Maturana (Maturana and Valera 1992), and social constructivist family therapist (McNamee and Gergen 1992).

This section of the paper has reviewed three phases in the development of nursing systemic theory. First, Johnson's and Roy's biopsychosocial homeostatic nursing theories. Second, King's and Neuman's information and interaction morphogenic nursing theories. Third, Roger's Newman's and Parse's unitary consciousness nursing theories. However, these phases are not sequential. They parallel and sometimes anticipate developments in the systems literature in related disciplines.

PART 2: EMPIRICAL SYSTEMIC STUDIES

The following studies were identified through information searching using the 'CINHAL plus Text' search engine. There are notably more articles on management than practice.

Systemic family practice

Family systems nursing is undoubtedly the most important development from the application of systems theory to nursing practice. Lorraine Wright and Maureen Leahey (1984) were vital to the appreciation of the importance of families to nurses. They developed the Calgary Family Assessment model which addresses structural, developmental and functional aspects of family life (Wright and Leahey 1994). The first International Conference in Family Nursing was in 1988, at the University of Calgary, hosted by Wright and Leahey (Whyte 1997:xv). Friedmann (1989) clarifies three levels of family nursing: nursing the sick child within the family, nursing the sick child with the family, "family systems nursing": the nursing the whole family. The Journal of Family Nursing was founded in 1995. Whyte (1997), based in Edinburgh, Scotland, suggested a foundation for family nursing comprised of Bowlby's (1952) attachment theory, nursing theory and Wright and Leahey's (1994) family nursing. She applied to chronic illness in childhood, specifically cystic fibrosis. More recently, Cummings (2002) has affirmed the importance of family systems nursing when caring for families with a child with cystic fibrosis. However, there have also been other applications of systems theory to nursing practice.

Bronfenbrenner's (1979) ecological systems theory was adopted by Green (2010) and combined with critical theory and in a reflection upon Canadian Aboriginal women's mental health. Bronfennbrenner was also adopted by Grant and Ramcharan (2001) and combined with Dunst et al's (1986a, 1986b, 1994) social support and social network theory, and Gourash's (1978) help-seeking and help-giving theory in a study of people with learning disabilities in the community.

Systemic nursing management

A range of systemic theories have been applied to nursing management, including, open systems theory, complex adaptive systems theory and chaos theory. Paley (2007:237) challenges the extent to which complex adaptive systems theory and chaos theory have actually been understood in the field of nursing management.

Open systems theory

Meyer and O'Brian-Pallas (2010) addressed the connection between nursing administration upon nursing practice in a Nursing Services Delivery Theory (NSDT). They argue for the value of a 'coherent framework that combines clinical, administrative, financial and outcome variables from a nursing perspective' (2010:2829), drawing upon earlier work by Katz and Kahn (1978) on the social psychology of organisations. This affords a framework of system energy inputs, throughputs and outputs and also subsystems concerning support, maintenance, and adaption. The emphasis for Katz and Kahn was upon systems as cycles of events, with outputs determining inputs, and the importance of feedback information in ensuring homeostasis. Empirical studies cited include Doran et al (2006), Robert et al (2000) and Gittell (2004).

Kitson (2008) argues for the value of systems theory in understanding innovation in healthcare, specifically, Miller and Rice (1967) on socio-technical systems and Senge

(1990) on organisational learning, in understanding of the use of knowledge in organisational change, drawing upon van de Ven et al's (1999) theory of innovation. Kitson stated a number of presumptions, such as' successful innovation in any system is a function of the local autonomy experienced by individuals, teams...and their ability to translate this into purposeful and planned activity (2008:224). This assertion of the value of socio-technical systems theory to management practice, which was commonplace in the 1960s and 1970s, is less common that assertions of the value of more recent systems theories. Some of these are now considered.

Complex adaptive systems

Holden (2005) defines complex adaptive systems as systems undergoing constant unpredictable change in the interactions of the components of a system, and in interactions between a system and its environment. This involves both stimulating positive (stimulating) and negative (inhibiting) feedback loops within the system and between the system and its environment. This change occurred according to the 'rules and regulations' followed by the components of the system, and system-environment interactions but without 'centralised command and control' (Holden 2005:654). Holden drew upon Plsek and Greenhaugh (2001) and Cilliers (1998) in this CAS definition. This definition of complex adaptive systems owes much to early definitions of open systems.

In a literature of complex adaptive systems (CAS) in nursing, Clancy (2008) defines CAS characteristics as self-organisation, emergence, non-linearity, chaos, and turbulence, drawing upon Kauffman (1992), Holland (1998), Prigogine (1980), Peitgen at al (2004) respectively. Clancy identifies discrete event simulation, social network analysis, data farming and evolutionary computation as some relevant research methods.

Empirical research into nursing problems has been noted. Holden identified the work of Anderson et al (2002, 2003) as important examples of the application of complex adaptive systems theory to nursing management. McDaniel (1997) McDaniel and Driebe (2001), who applied complex adaptive systems theory to nursing administration. McDaniel concluded that frontline managers were better placed to direct service delivery through 'flexible, porous responses' than top management (Haigh 2008:300). Therefore he recommended the development of autonomous 'self-referant systems' that adapted to local conditions (Haigh 2008:300). Clancy (2008) identified the work of Sheridan (1985) into staff-turnover in nursing homes and her own work into heart failure in hospital (Clancy 2007) as applications of CAS to nursing management.

Chaos theory

Phillips (1991), in an article titled 'chaos theory and nursing systems research', argues for the utility of Prigogine's (1984) theory of self-organising systems which operate at 1) equilibrium, 2) near equilibrium, or 3) far-from-equilibrium states. Systems in far-from-equilibrium states tend "toward new structures characterized by increased levels of complexity, sophistication and variety" (Radzicki, 1990:83 cited in Marks 1994). Other early examples of chaos in the field of nursing were: Coppa (1993), and Vincenzi (1994). Hayles (1999) usefully contrasts the technical use of chaos theory and associated

qualitative methods, with the metaphoric use of chaos theory with associated qualitative methods. Examples of these two approaches are now considered.

In a technical empirical study of chaos in nursing, Haigh (2008:298) advocated simplified chaos theory as a 'pragmatic' means to 'forecasting service-related outcomes'. She used statistical modelling to identify a limited cycle attractor oscillations in healthcare service activity. In metaphorical empirical study of chaos in nursing, Paley and Eva (2011) collected narratives, and then inferred the rules, in the sense of explicit policies and procedures, and implicit customary habits of thought and action, that informed the underutilisation of rehabilitation services for individuals with metastatic spinal cord compression.

The historical context for the consideration of complex adaptive systems theory and chaos theory in nursing is open to debate. In relation to complex adaptive systems theory, Clancy et al (2008:248) notes 'significant unpredictability and variation of outcomes across healthcare organisations' and the associated issue of the management of quality, risk and cost-effectiveness. In relation to chaos theory, Haigh (2008:298) succinctly states: 'Nursing care has become more complex and resources in the shape of time and personnel have become increasingly scarce'. The importance of the USA Institute of Medicine reports in raising the profile of complexity in healthcare management is noted by Clancy et al (2008:248) and Paley and Eva (2011:270).

Systemic policy analysis

'Whole systems thinking' according to Onyett (2004:791), has a 'high profile within the policy rhetoric' in UK National Health Service mental health policy. This arose due to 'conspicuous gaps' (Department of Health 1999:49 cited in Onyett 2004:791) in the service through which individuals were falling. The tragedies that arose from this, arguably involving 'tabloid scaremongering and misrepresentation' (Onyett 2004:802), had resulted in political debates requiring the review of mental health legislation and policy. Furthermore, Onyett (2004:802) argues that systems theory was deliberately disseminated into mental health service management and practice in order the challenge the 'resistance to change' in mental health services.

Summary

The overlap between family systems nursing and systemic nursing management literature is limited. Family systems nursing arose through an international network of nurses whereas systemic nursing management in the USA and the UK arose in the context of cost containment, workforce scarcity and risk management.

PART 3: SYSTEMIC THEORY IN NURSING PRIMERS

Systemic adult nursing

The themes that emerged from a consideration of adult nursing primers, for example, Baillie (2009) were biological systems and the nursing process. The biological systems

addressed included circulatory, digestive, endocrine, integumentary, lymphatic, muscular system, nervous, reproductive respiratory and skeletal and urinary. There was sometimes an implicit assumption the value of biological homeostatisis. This understated application of systems theory is significantly less sophisticated than earlier statements of systems theory in nursing theory.

Systemic children's nursing

In a consideration of the core principles and practices of childrens' nursing, Coyne et al (2010) identified John Bowlby's (1952) early research into attachment as fundamental. Specifically, an awareness of attachment, anxiety and loss. Reference was made to the secure attachments, and also the adaptive attachments, such as ambivalent and avoidance attachments, that formed internal working models for attachments to nurses. In contrast, Bowlby is not addressed in the two other primers considered: Glasper et al (2010), and Trigg and Mohammed (2010). Nevertheless, there is an acknowledgement of family-centred care as the underpinning principle of childrens' nursing (Glasper 2010:57).

The application of Bowlby's attachment theory to childrens' nursing is a longstanding one. There were concerns about 'the problems of separation, the effect of hospitalization, and the break in family links as a cause of maladjustment later in life' among children nurses leaders in the early 1950s (Duncombe 1979:50).

Systemic mental health nursing

Systems theory and practice in mental health nursing was more sophisticated in than in other specialities. Mental health nursing primers identify three strands,: attachment theory and practice, solution focused practice, and collaborative and narrative approaches to working with families and networks.

Harrison (2004:453-4) address the family as a system, using an unnamed model, with considerations of closeness and distance, power, and emotional climate, when working with children and adolescents with mental health problems. He also considers Bowlby's (1969 cited Harrisson 2004:452), attachment model as a relevant model of child development, but mistakenly attributed his idea of internal working models to another author (Bee 2000).

Phil Barker (1998, 1999) adopts some aspects of Steve de Shazer's (1988) solution focused practice (Webster 2009), the origins of which are in the Watslawick's et al's (1967) strategic therapy. Later, Peter Ryan and Steve Morgan (2004) applied Charles Rapp's (1998) strength model from social work, which draws upon Steve de Shazer's (1988) solution focused practice , into Assertive Outreach Team nursing.

Gordon and Stevenson (2009) explicitly draw upon von Bertalanffy's General Systems Theory to develop a systemic rather than linear understanding of causation, with an emphasis upon family homeostasis. They also make reference to Maria Selvini Palazzoli's et al's (1980) seminal paper in Milan systemic therapy. Stevenson and Gordon (2009) contrast therapist led approaches to change, making reference to Watslawick et al's (1967) and early Milan systemic therapy, with collaborative approaches to change, drawing upon Anderson and Goolishan (1992), and narrative

approaches, drawing upon Epston and White (1992). There is also a focus upon working with families and their wider networks, drawing upon the work of Seikkula and Arnkil (2009) and others. Stevenson and Gordon (2009:452) conclude that a collaborative 'systemic orientation promotes opportunities for creative change', but caution that nurses often feel 'inadequately skilled' (Gordon and Stevenson 2009:112) when working with families. In short, mental health nursing as reflected by primers has been influenced by a range of systemic approaches, including attachment, strategic and collaborative approaches.

Systemic learning disability nursing

The search for systems theory and practice primers identified ecological systems theory. Aldridge (2004) identifies Urie Bronfenbrenner's (1917-2005) Ecological Systems Theory as a suitable model for learning disability nursing practice. Bronfenbrenner (1979) analyses the mircrosystem, consisting of a self-concept based upon physical, cognitive, affective processes, the mesosystem, consisting of healthy behaviours and relationship, and the macrosystem, consisting of the physical, political, social and cultural environment of the person. He adds the chronosystem, consisting of past, present and future. A nursing care plan based upon ecological systems theory seeks to assist and individual's holistic development through opportunities for exploratory experiences. The other two primers (Peate and Ferns 2006, Marwick and Parrish 2003) did not address systems theory and practice.

Summary: Primers

Systems theory and practice generally has an understated, and marginal place in nursing primers. Furthermore, there are some striking dissimilarities in the systems theory that is adopted across nursing specialities. The emphasis in adult nursing is upon biological systems. The emphasis in children's nursing is upon Bowlby's attachment theory. The emphasis in learning disability is Bronfenbrenner's social ecological theory. There is a wider range of systemic theories adopted in mental health nursing, including de Shazer's solution focused practice, and Anderson and Goolishan's collaborative and White and Epsom's's narrative approaches. The most notable similarity is the adoption of attachment theory in nursing children with mental health problems, and children's nursing.

DISCUSSION

The evolution of systems thinking in nursing appears to have resulted from problems in specific domains. For example: systemic nursing theory arose from the problematic of professionalization of nursing in the academic domain. Systemic family nursing also arose from the problematic of professionalization in a collaboration between academic and practice domains. The variation of systems theory in nursing specialities reflects medical specialisation within the practice domain. Systems family nursing is able to transcend these specialities and develop a coherent theory and practice. Systemic theory, complex adaptive and chaos theories arose from the problematics of cost-containment

and risk management in the domains of politics and governance. The problem focused pragmatism has as yet resulted in much coherence of systemic nursing theory and practice in the various domains. However, this is perhaps to be expected. In a reflection upon disciplinary matrix development, Bird (2004) suggests:

The evolutionary development of an organism might be seen as its response to a challenge set by its environment. But that does not imply that there is some ideal form of the organism that it is evolving towards. Analogously, science improves by allowing its theories to evolve in response to puzzles and progress is measured by its success in solving those puzzles; it is not measured by its progress towards to an ideal true theory (Bird 2004)

This does not discount Holden's (2005) view that there is a vital tradition of nursing systemic theory and practice. Indeed, it suggests ongoing vitality as new influences are accommodated. Rather than seeking to, it is more useful to note trends in the existing literature. There is the worthwhile activity of seeking to understand the existing general application of systems theory in nursing without imposing specific theoretical frameworks upon the further development nursing systems theory.

First, one of the strongest connections between nursing theory and nursing practice is the application of Bowlby's (1952) systemic attachment and Bronfenbrenner's (1979) ecological developmental approaches. The traditional involvement of nurses in transitions, for example, birth, sickness and death perhaps inclines nursing theory and practice towards these theories. Nursing may be strongly placed for a practice based transdisciplinary consideration of biological, psychological, sociological and political systems.

Secondly, nursing does not necessarily assume an individual is the basic unity of analysis. Indeed, family systems nursing is one of the strongest components of systemic nursing practice. There is also a long-standing consideration of the interaction between individual and community and society in systemic nursing theory and practice. This tends to assume the value of consensus rather than conflict. This results in the absence of the consideration of the social construction of differences, for example, gender and ethnicity, in the nursing literature.

Thirdly, there is a clear need to link up systemic thinking practice, management and governance, and policy and politics. Meyer and O'Brian-Pallas (2010:2829) are clearly correct in identifying the potential for connecting nursing practice, nursing administration, healthcare administration, and global healthcare. Hingley-Jones and Mandin (2007) identify an ecosystems as an theory that is applicable to both social work practice and policy. There is the possibility for an attachment theory connection in nursing to become similarly important in linking practice and policy, given its rootedness in nursing practice. There could be linked to Maturana and Varela's (1992) biological structurally determined phenomenology of autopoetic individual, family and organisational systems.

Finally, the information searching strategy was not entirely successful in revealing the tradition of systemic thinking in nursing. A limitation of this paper is the use of one

search engine, namely, 'CINHAL with Text'. CINHAL would have revealed more papers. However, the paper is unusual in its consideration of diverse forms of nursing literature, and its understanding of an ecology of systemic ideas in nursing. The Tavistock socio-technical systems theory upon the development of health services and nursing, for example, Menzies (1960) and Towell (1975) was hardly evident. Paley's criticism that there appeared to be commonplace misunderstanding and specifically repackaging of older systemic theories in the healthcare literature may arise from a lack of understanding of the development of systems theory.

CONCLUSION

The disciplinary matrix of nursing has proved a fertile ground for a range of systemic theories and practices. These ideas were propelled into the practice discipline of nursing by the problematics of professionalization and politics. Seeking to discern some kind of pattern in the systemic theories and practices that have taken root in nursing remains a worthwhile ongoing project. The creation of such coherence within the disciplinary matrix and with its wider context may assist in usefully positioning nursing in its policy and political environment. .

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