

## **Complexity Compression in Rural Nursing**

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### **Abstract**

A large and increasing body of literature suggests nurses face mounting production pressure related to complexity of patients, systems, and escalating demands from both. This phenomenon is identified as complexity compression and describes an experience wherein nurses are expected to take on additional, unplanned responsibilities while simultaneously satisfying existing responsibilities in a condensed timeframe. Rural nursing practice appears as a fitting example of doing more and doing differently in a time-pressured environment. However, the phenomenon of complexity compression has yet to be discussed specifically in relation to rural nursing or from the lens of a rural nursing theory. Conceptualization of complexity compression in rural nursing through use of theory may help redefine the true nature of rural nursing practice and promote discussion and collaboration among nurses, administrators, educators, and policy makers in creation of better rural work environments, improved educational opportunities for rural nurses, and robust healthcare outcomes for rural populations.

**Keywords:** Complexity compression, Conceptualization, Theory, Rural nursing

## **Complexity Compression in Rural Nursing**

The *work of nursing* has been characterized as both ‘doing more with less’ and ‘doing things differently with less’. Rural nursing is an apt example of doing more and doing differently in an under-resourced environment. Attributes of complexity appear to characterize the nature of rural generalist nursing today (Barrett, Terry, Le, & Hoang, 2016). Krichbaum et al. (2007) have identified and described production pressure in nursing as complexity compression (CC); but this phenomenon has yet to be explored specifically in relation to rural nursing or from the lens of rural nursing theory (RNT). This discussion explores the phenomenon using Long and Weinert’s (1989) theory and uses examples from the literature to illustrate the relevance of the phenomenon to rural nursing practice. The purpose is to present a conceptualization of rural nursing practice that more fully captures the realities and challenges of rural practice. Although a solution is not the intent of the discussion, it is hoped that this perspective promotes voice and advocacy among rural nurses for improvements in work environments, policy, education, and research to meet the needs of rural residents.

### **The Problem and its Context**

#### **Rurality**

Nearly half of the global population lives in rural areas (Brownlee, 2011). In the United States (US) in 2015, 46.2 million live in nonmetropolitan counties (United States Department of Agriculture Economic Research Service [USDA ERS], n.d.). Despite these population statistics, no generally accepted definition of rurality exists. Moreover, commonly used definitions are imprecise (Williams, Andrews, Zanni, & Fahs, 2012). For this discussion, rurality represents an attribute of a place based on individuals’ perceptions of population density, remoteness from urban centers, or abundance of farmland (Indiana Business Research Center [IBRC], 2007).

## **Rural Nursing**

Rural nursing has been described as fundamentally different from nursing practice in urban settings (Jackman, Myrick, & Yonge, 2012; MacLeod et al., 2008). Long and Weinert (1989) define rural nursing as the provision of healthcare by the professional nurse to individuals living in sparsely populated areas. Approximately 20% of all nurses live in rural areas. Staffing patterns indicate proportionally more licensed practical and vocational nurses are employed per capita in rural settings (Rural Health Information Hub, n.d.).

### **Complexity Compression.**

There is a large and increasing body of literature suggesting nurses face mounting production pressure related to complexity of patients and systems, and escalating demands from both. Evidence of the nursing shortage, an aging population, and increasing numbers of people with chronic illness represent a few of the demands affecting the nursing profession (Institute of Medicine [IOM], 2001; 2004). In the context of nursing care, Krichbaum et al. (2007) identify this as CC and describe this as an experience wherein nurses are expected to take on additional, unplanned responsibilities while simultaneously satisfying their existing responsibilities in a condensed time frame.

Krichbaum et al. (2011) found attributes of CC include: “the work of nursing”, “system factors”, and “personal factors” (p. 19). The work of nursing includes unexpected elements in the workplace directly interfering with the ability of the nurse to carry out her or his work. System factors represent unpredicted elements in the nurses’ work setting, originating in administration/organizational structure affecting the ability to perform nursing responsibilities within a given time period. Personal factors are elements emerging from within the nurse’s immediate personal situation (Krichbaum et al., 2011). CC in nursing has been recognized as

important in job satisfaction and patient outcomes (Aalto, Karhe, Koivisto, & Valimaki, 2009), patient safety, quality outcomes, and staff satisfaction (Schmidt & Pinkerton, 2009).

In a recent review of the literature, Barrett et al. (2016) identified issues in rural nursing practice characterizing attributes of CC as described by Krichbaum et al. (2007; 2011). Authors suggest these issues result in a need for rural nurses to provide greater complexity of care in community settings. Issues included organizational changes, geographic challenges, role definitions, work settings, and human resources.

### **Rural Nursing Theory**

Core concepts and relational statements of Long and Weinert's (1989) RNT may provide insight and be useful for nurses reflecting on the attributes of CC in the care of rural populations. A significant assumption associated with RNT is that healthcare needs in rural settings are quite different from those in urban settings. Theoretical core concepts identified in relation to health needs of rural residents and rural nursing practice include: "...work beliefs and health beliefs; isolation and distance; self-reliance; lack of anonymity; outsider/insider; and old-timer/newcomer" (p.113). The theory incorporates three relational statements: "rural dwellers define health as primarily the ability to work, to be productive, and to do usual tasks" (p.120); "...rural dwellers are self-reliant and resist accepting help or services from those seen as outsiders or from agencies seen as national or regional "welfare" programs" (p.120); and "...healthcare providers in rural areas must deal with lack of anonymity and much greater role diffusion..." (p. 120).

Long and Weinert (1989) developed their middle-range RNT based on the belief that needs of rural residents could not be addressed by nursing models developed in urban areas. In a recent integrative review, Williams et al. (2012) concluded no one unified theoretic foundation for rural

research exists to date. RNT allows us to identify specific issues cited in the rural nursing practice literature, consider these through the lens of theoretical core concepts, relational statements, and propositions, and reflect on these as potential exemplars of CC as initially defined by (Krichbaum et al., 2007).

### **Defensibility**

The literature provides evidence of CC in rural nursing practice to support a defense of this conceptualization of the realities of the rural work and work setting among nurses. To highlight elements of rural nursing representing CC, this discussion addresses these issues using Krichbaum et al, (2007; 2011) attributes of CC.

### **Work of Nursing**

The work of nursing includes unexpected elements in the workplace directly interfering with the ability of the nurse to carry out her or his work (Krichbaum et al., 2011). The work of nursing across settings has indeed changed with reduced length of stay and increased patient acuity levels (IOM, 2011). Such change translates to a demand for nurses to take on new and/or expanded roles in care coordination and preventive care (Health Resources and Services Administration [HRSA], 2014). Examples such as greater variability in patient census and acuity levels in rural healthcare settings can slow the rate at which rural nurse come to recognize patterns and cues for similar caregiving situations (Seright, 2011).

### **Expert generalist.**

The scope of rural practice requires nurses to be comfortable within the role of expert generalist (Knight, Kenny, & Endacott, 2016) due to limited resources (Chipp et al, 2011), workforce shortages (Brewer, Kovner, Greene, & Cheng. 2009), staffing patterns (Bonnell Alonzo, Conejo, & Heinze., 2009), slow hiring, and layoffs (American Hospital Association

[AHA], 2011). In rural nursing the expert generalist must be flexible, possess a broad knowledge base (Montour, Baumann, Blythe, & Hunsberger, 2009), assume additional responsibilities that are traditionally beyond the professional role (Keane, Smith, Lincoln, & Fisher., 2011), and develop an expanded scope of practice (Knight et al., 2016). Role diffusion (Barrett et al., 2016) of this sort also requires clinicians have a knowledge base and clinical ability applicable to a range of ages, cultures, and pathophysiological conditions that may occur in rural clinical practice encounters.

Rural nurses must possess unique competencies and expertise to meet the needs of rural populations. Among rural patients, the nurse may be the first and only point of contact with the healthcare system (AHA, 2011; International Council of Nurses [ICN], n.d.). For example, the preference for independent decision-making about health and healthcare among rural residents' results in the rural nurse managing more crises than urban peers (Bushy & Leipert, 2005). Rural nurses are forced to function in a more independent generalized fashion when they are required to "float" to a variety of clinical areas representing significant diversity in patient age, acuity, and specialty practice (Hurme, 2009; Molinari, Jaiswal, & Hollinger-Forrest, 2011). In addition, practicing public health principles is an expectation of rural nursing practice (Bennett, 2009).

### **Cultural differences.**

A cultural environment may include differences in traditions, customs, and value/belief systems of the family and community related to health, injury, and illness (World Health Organization [WHO], n.d.). Values and culture affect illness recognition, healthcare seeking, attitude toward clinicians, and decision-making about health and healthcare (Nelson, Pomerantz, Howard, & Bushy, 2007). A larger proportion of patients in rural healthcare settings are affected by regional customs and community practices; thus, cultural health and healthcare values exert a

more significant influence in rural nursing practice (Nelson et al., 2007). As such, rural nurses must possess unique skills to cope with coexisting cultural systems of healthcare (Grant, Haskins, Gaede, & Horwood, 2013).

Although connectedness with community is the foundation for patients' trust in nurses and nurses' accountability to patients (Baernholdt, Mowinski Jennings, Merwin, & Thornlow, 2010; Conger & Plager, 2008), connections with a community may not be easy for nurses in rural settings. Rural populations sometimes view healthcare professionals as 'outsiders' (Baernholdt et al., 2010; Chipp et al., 2011). However, connectedness is an important element in culturally relevant, quality care, and has been identified as a unique, additional quality indicators associated with rural culture (Baernholdt et al., 2010).

#### **Vulnerable population.**

Healthcare providers and policy makers recognize the challenges inherent in providing care to vulnerable populations (AHA, 2011) and rural residents meet many of the conditions for vulnerability. Rural populations are older, less affluent, less educated, and have less access to social programs and health services (National Rural Health Association [NRHA], 2013). Health disparities for this population include increased functional limitations, higher mortality rates (Agency for Healthcare Research and Quality [AHRQ], 2013), poorer health outcomes, and higher morbidity rates (Australian Institute of Health and Welfare [AIHW], 2012). In the US, this population is at a greater risk of being uninsured or under-insured (US Department of Health and Human Services [USDHHS], n.d.,a). Rural households have higher rates of chronic disease, disability, and mortality (Jones, Parker, Ahearn, Mishra, & Variyam, 2009). Rural residents more commonly face hazards on a day-to-day basis related to natural hazards, high physical-risk activities, and excessive travel distance (Severo, et al., 2012; Veitch, 2009).

### **Professional isolation.**

Professional isolation is a unique challenge in rural nursing (Paliadelis, Parmenter, Parker, Giles, & Higgins, 2012; Williams, 2012). Inherent in rural isolation is the notion of being distanced from some aspect of the profession (i.e., technology, expertise, education, etc.) or lacking some element necessary to the professional role. In a review on professional isolation among rural nurses, Williams (2012) found the concept of isolation frequently cited. Professional isolation contributes to uncertainty/doubt in provision of safe/effective care (Petrie, 2011), competence problems (Williams, 2012), performance appraisal problems, inability to use training/qualifications to the full extent, and nurse retention problems (O'Donnell, Jabareen, & Watt, 2010).

### **Systems**

System factors represent unpredicted elements in the nurses' work setting, originating in administration/organizational structure affecting the ability to perform nursing responsibilities within a given time period. Evidence suggests up to 40% of the nurse's time is occupied in satisfying the ever-growing demands of the healthcare delivery system and is not associated with direct care-giving (Hurst, 2010; Westbrook, Duffield, Li, & Creswick, 2011). Institutional work processes burden rural nurses and have negative implications for patient safety and nursing practice (MacKinnon, 2010) and problems in nurses' work environment have been described (Robert Wood Johnson Foundation [RWJF], 2009).

### **Nurse staffing.**

A well-known element contributing to CC relates to the current nursing shortage. The ratio of healthcare providers to residents in many rural areas is poor (Grobler et al., 2009). This shortage is a significant global issue (Campbell et al., 2013) with rural areas in developing

countries tending to be the most underserved regions (Lea et al., 2008). A comparison between per capita rates of nurses to residents shows a shortfall in rural settings (85.3 nurses per 10,000 rural residents vs. 93.5 nurses per 10,000 urban residents). In addition, rural Health Professions Shortage counties outnumber similarly designated urban counties with a similar designation by a ratio of 2 to 1 (USDHHS, 2011).

Rural healthcare also suffers from problems with staff retention (Paliadelis et al., 2012). New nurse turnover rates may be as high as 60% for rural nurses (Brewer et al. 2009). Professional isolation (Williams, 2012), viewing the job as stressful (Dotson, Dave, & Cazier, 2012), and conflicting nurse-hospital values (Bragg & Bonner, 2015) have been cited as inhibitors to rural nurse retention and recruitment efforts. Although the Affordable Care Act created several programs to help address the rural hospital workforce shortage, programs to retain existing nurses in rural areas were not included in the reform effort (AHA, 2011).

### **Technology and workforce development.**

Technology acumen and an ability to approach nursing practice from an evidentiary basis are essential for autonomous practice, quality patient outcomes, and building the rural health-nursing workforce. Yet, nurses in rural settings may experience barriers to technology (Fairchild et al., 2013; Koessl, 2009). For example, many rural communities have little or no access to the Internet and minimal information and communications technology experience (IOM, 2005). Rural hospitals lag behind urban hospitals in health technology use (IOM, 2005; RHRC, 2009). As of 2008, less than 3% used an electronic health record with computerized provider-order-entry capability (McCullough, Casey, & Moscovice, 2010).

Despite the push to develop a nursing workforce that assumes individual responsibility to seek out the best available evidence when making clinical decisions, some findings suggests

novice rural nurses show a preference for collaboration with co-workers over other resources (i.e., policy books, decision trees, etc.) in clinical decision-making (Seright, 2011). Adherence to evidence-based guidelines is lower in rural hospitals (Goldman & Dudley, 2008). Additionally, nurses in rural settings may experience barriers to evidence-based practice utilization (Koessl, 2009). For example, professional development and continuing education opportunities to build the rural health nursing workforce in these areas may be difficult for rural nurses to obtain due to lack of time, a dearth of available programs (Jukkala, Henly, & Lindeke, 2008), and institutional structure and work processes (MacKinnon, 2010). In some situations, subsequently, rural nurses may have difficulty meeting state mandated requirements to maintain licensure (McCoy, 2009).

Along with evidence-based practice, other essential workforce development needs for rural nurses have been identified and include horizontal-violence, self-empowerment, self-reflection, (Fairchild et al., 2013). The very nature of these needs may present as barriers as they are sometimes viewed as “intangibles” (Fairchild et al., 2013, p. 368) and are dismissed by administration in deference to issues that are more easily tracked in databases (i.e., quality of care). Frequently rural nurses believe they are peripheral to the decision-making process that and issues of concern to them are not understood or supported by administrators (Miskelly & Green, 2014; Paliadelis, et al., 2012).

#### **Administrative disconnect.**

Disconnects between leaders and staff members in healthcare settings have been reported to be associated with unhealthy work environments and perceptions of non-authentic leadership practices (Institute for Healthcare Improvement [IHI], n.d.). Evidence suggests a divide between hospital administrators and clinicians related to organizational vision and focus in rural healthcare settings (Fairchild, Ferng, & Zwerner, 2015). MacKinnon (2012) used institutional

ethnography for exploring the social and institutional organization of rural nursing work experiences and identified a disconnect between administrative and nurse emphases in relation to provision of healthcare. Findings suggested an institutional or administrative focus on efficiency and cost savings and rural nurses' focus on 'safeguarding' patients assigned to their care (MacKinnon, 2012). Although rural nurses advocated for safety standards to protect patients, management's "efficiency discourse" (MacKinnon, 2012, p. 264) failed to acknowledge rural nurses' understanding about local variations in need for nursing care in rural settings.

### **Personal**

Personal factors are described as those elements emerging from within the nurse or the nurse's immediate personal situation (Krichbaum et al., 2011). Approximately 16% of US nurses live in rural areas (ANA, 2014). Most nurses working in rural settings report a rural background or upbringing (Dalton, Routley, & Peek, 2008; Daniels, VanLeit, Skipper, Sanders, & Rhyne, 2007) and almost 92% of nurses in rural work settings are white, compared to 73% of nurses employed in urban settings (ANA, 2014). The ANA (2014) reports the average age of a rural RN is 44.9 years, compared with 44.6 years for urban RNs. Compared with urban counterparts in the US, the rural nursing workforce is nearer to retirement (National Advisory Committee on Rural Health & Human Services [NACRHHS], 2010).

Choice of a rural generalist role is often influenced by life experience and perceptions of convenience (Molinari et al., 2011). Nurses in rural practice are less likely to work for a hospital (ANA, 2014) and more likely to work in community/public health settings, extended care settings/nursing home, or in ambulatory care (Skillman, Palazzo, Keepnews, & Hart, 2007). Evidence suggests mean annual salaries are higher for rural nurses who commute out to larger rural or urban work settings and this "out-commuting" was seen more frequently among nurses

living in economically stressed rural communities (Skillman, Palazzo, Doescher, & Butterfield, 2012). Educational preparation for practices differs between rural and urban nurses with rural nurses significantly less likely to acquire a baccalaureate degree or additional nursing degree (Bigbee, Otterness, & Gehrke, 2010; Newhouse & Morlock, 2011).

### **Role boundary issues.**

Nurses working in rural settings often have deep roots within their communities and multiple levels of personal contact with patients (Baca, 2011; Barrett, Terry, Le, & Hoang, 2015); thus, boundaries between nurses' work related roles and personal lives are ill-defined (Bushy, 2003). Amplified social connections within the community and a perceived high level of visibility within the rural community makes rural nursing different from urban nursing (Bushy 2002; Scharff, 2010; Winters & Lee, 2010). This notion of lack of anonymity for nurses in rural practice is well described (Swan & Hobbs, 2016) and may lead to stress for rural nurses (Nelson et al., 2007). Advance practice nurses in rural settings report that organizational structure contributes to role boundary concerns (Cant, Birks, Porter, Jacob, & Cooper, 2011). Other dynamics drive boundary issues. Baca (2011) describes a dual relationship in rural practice wherein the nurse is both clinician and friend or provider and family member. Boundary issues identified in rural settings also comprise threats to confidentiality, resource allocation issues (Nelson et al., 2007), and conflicting demands between personal and work requirements (Hounsgaard, Jensen, Wilche, & Dolmer, 2013).

### **Stress.**

Stress is common among rural healthcare providers (Barrett et al., 2015; Newman & Berens, 2010) and the international literature describes some unique stressors for rural nurses, beyond stressors identified among urban counterparts (Lenthall et al., 2009; Paliadelis et al.,

2012. Occupational stress among rural nurses has been attributed to hazardous situations in the wards (Jondhale & Anap, 2013), emotional exhaustion (Opie et al., 2011), and occupational violence (Barrett et al., 2015; Lenthall et al., 2009).

### **Change process.**

The change process is rarely easy; but the rural healthcare setting introduces additional challenges for the nurse. Change may be viewed by rural residents as imposed from outsiders or as an agenda that is “not for us” (Macken-Walsh, 2009, p. 15). The importance that rural residents ascribe to the context of the community (i.e., community based networks, conventions, and social norms) can be a barrier to change in rural settings (Macken-Walsh, 2009; Sleet & Gielen, 2015). Expected challenges inherent to the change process are further heightened in the rural setting due to isolation (Farmer, Dawson, Martin, & Tucker, 2007). Even the pace of change has been found to be affected by pressures associated with living in smaller communities (Farmer et al., 2007).

## **Discussion**

### **Revealing Complexity Compression through Theory**

Key and related concepts of RNT are useful in revealing the phenomenon of CC in rural nursing practice using examples from the literature. Rural dwellers view health as the ability to be productive and perform the usual work role (Lee & McDonagh, 2013; Long & Weinert, 1989; Winters, 2013). This functionality perspective (Molinari & Guo, 2013) may create CC for rural nurses as they work to provide interventions that are unlikely to be embraced such as wellness and health promotion education or preventive treatments (AHA, 2011; AHRQ, 2013, AIHW, 2012; Jones et al., 2009; NRHA, 2013). Downstream, this rural view of health may further contribute to CC in the provision of nursing care if rural dwellers delay needed healthcare or

arrive with acute illness on initial presentation (AHA, 2011; AHRQ, 2013, AIHW, 2012; Jones et al., 2009; NRHA, 2013; Seright, 2011).

The related concept of isolation in rural nursing (Long & Weinert, 1989; Winters, 2013) contributes further to understanding the phenomenon of CC in practice. Professional isolation, or reduced communication and interaction (Lee, Winters, Boland, Raph, & Buehler, 2013), is a unique challenge in rural practice (Paliadelis et al., 2012; Williams, 2012). Professional isolation is associated with a variety of negative outcomes to include feelings of doubt in the provision of care, concerns about professional competence, and failure to retain nurses in the clinical setting (O'Donnell et al., 2010; Petrie, 2011; Williams, 2012). These outcomes would drive CC in rural nursing practice by creating additional, unplanned responsibilities for nurses. One example would be the need for significant network formation (Rygh & Hjortdahl, 2007) to mitigate issues associated with distance from some needed aspect of the profession or element necessary to the professional role. Certainly, this task would be an added, additional, responsibility to be performed by the rural nurse while simultaneously satisfying existing responsibilities. In addition, the recognized shortfall of nurses in rural settings (Paliadelis et al., 2012; USDHHS, 2011) could be compounded by a failure to retain nurses in rural practice associated with professional isolation (O'Donnell et al., 2010) and worsening CC among those nurses who remain in rural practice.

As a construct in the rural setting, 'distance' affects healthcare at many levels. For example, distance from the best possible evidence (Fairchild et al., 2013; Goldman & Dudley, 2008) and subsequent clinical decision-making based on proximity and collaboration with rural coworkers (Seright, 2011) could lead to CC through unanticipated clinical outcomes. Individual efforts of rural nurse to build evidence based practice acumen through continuing education

could add to CC given a dearth of available resources in rural settings (Jukkala et al., 2008; MacKinnon, 2010). In rural practice, nurses believe issues of concern to them are distant or peripheral to the administrative decision-making process (Miskelly & Green, 2014). In such a dynamic, CC can occur when nurses are required to cope with unplanned responsibilities that unfold in settings configured by healthcare administrators that fail to acknowledge nurses' tacit understandings of rural patients' needs (MacKinnon, 2012).

Rural residents are self-reliant (Long & Weinert, 1989) and may turn inward to their own resources for needed healthcare rather than engaging with formal care systems (Lee et al., 2013). Folk remedies, healing practices, and cultural systems of healthcare exert a significant influence on rural nursing practice (Molinari & Guo, 2013; Nelson et al., 2007). For example, complementary and alternative medicine use among rural dwellers is high and is widely integrated into rural social and health networks (Wardle, Lui, & Adams, 2012). This may have negative ramifications for the provision of care in the form of CC. Additional complexity is introduced into the system as the rural nurse needs keen knowledge and unique skill to cope with these additional demands (Grant et al., 2013) of these informal systems.

Rural nurses are often as outsiders or newcomers by rural dwellers (Long & Weinert, 1989; Lee & McDonagh, 2013). Rural dwellers use these views of their environment to guide interactions and relationships (Long & Weinert, 1989); thus, nurses may not be accepted (Baernholdt et al., 2010; Chipp et al., 2011). Acceptance is an important element in understanding rural community expectations and fulfilling clinicians' responsibilities to the community (Molinari & Guo, 2013). Such perceptions appear relevant to CC in rural nursing practice. For example, nurses may take on additional, unplanned responsibilities as they attempt to access privileged information and informed networks required in providing care. Additional

effort may be required in situations that necessitate awareness of implicit assumptions and unique lay resources. The rural nurse, in working to earn the power that is embedded in true acceptance, may expend significant effort. A related concept that is part of modern healthcare, change, may also be perceived by rural dwellers as imposed from outsiders (Macken-Walsh, 2009). Recognizing the importance rural dwellers ascribe to community context (Sleet & Gielen, 2015); nurses could expect to experience CC when implementing change efforts.

Rural nurses have a limited ability to preserve a private life (Long & Weinert, 1989) as they embody dual roles (Molinari & Guo, 2013) of clinician and friend. The loss of anonymity in the rural caregiving dynamic (Long & Weinert, 1989; Swan & Hobbs, 2016) may create CC as the nurse manages additional tasks associated with threats to confidentiality, resource allocation among residents meeting criteria for vulnerability (AHRQ, 2013; AIHW, 2012; NRHA, 2013; USDHHS, n.d.,a), managing stress (Nelson et al., 2007), and coping with unplanned responsibilities stemming from role boundary issues (Cant et al., 2011). Stress from other sources among rural nurses (Barrett et al., 2015; Jondhale & Anap, 2013; Opie et al., 2011) could further compound CC through nurse turnover, and subsequent burdening of nurses who remained in the rural settings with additional, unplanned responsibilities.

Rural nursing practice has been described as a generalist role (Molinari & Guo, 2013) with specialists' knowledge (Molinari & Guo, 2013). This expertise is required in rural practice (Knight et al., 2016) and is further evidence of nurses assuming additional responsibilities in rural practice (Keane et al., 2011) as aligned with notions of CC. The related concept of role diffusion (Long & Weinert, 1989; 2013; Molinari & Guo, 2013) in rural practice adds to CC as nurses are expected to possess additional knowledge and skill applicable to a range of populations, cultures, and conditions (Barrett et al., 2016) so that they can function

independently when ‘floating’ to a variety of clinical settings (Hurme, 2009; Molinari et al., 2011).

### **Attributes of Complexity Compression**

Krichbaum et al. (2011) identified work, system, and personal attributes and noted how these interfered with the ability of the nurse to carry out work and affected the ability to perform nursing responsibilities within a given time period. This was described as CC in nursing and defined as an experience wherein nurses are expected to take on additional, unplanned responsibilities while simultaneously satisfying their existing responsibilities in a condensed timeframe (Krichbaum et al., 2007).

In the current discussion, use of the key and related concepts of RNT (Long & Weinert, 1989) to consider examples from the literature promoted identification CC in rural nursing practice that exemplified all three attributes Krichbaum et al. (2011) describe as the underlying structure of the experience of CC. This conceptualization of CC in rural practice aligns with findings from a recent review of the literature on issues and challenges experienced by rural generalist nurses (Barrett et al., 2016) that describes additional, unplanned responsibilities and pressures on nurses.

### **Conclusion**

Rural Nursing Theory (Long & Weinert, 1989) did allow for identification of specific issues cited in the rural nursing practice literature, consideration of these through the lens of theoretical key concepts and related statements, and conceptualization of this as CC as defined by (Krichbaum et al., 2007). Molinari and Guo (2013) call for more testing of RNT to understand the rural environment, the work of the rural nurse generalist, and needs of rural

dwellers. Consideration of CC in rural nursing in unison with reflection on RNT may ultimately help redefine the true nature of rural nursing practice.

Certainly, CC affects all nurses (Krichbaum et al., 2007). Scharff (1987) opined the core of rural nursing practice does not differ from urban nursing. It remains important, nonetheless, to consider rural nursing in particular as potentially consistent with CC based on RNT (Long & Weinert, 1989) and existing literature. This conceptualization of rural nursing practice has not previously appeared in the literature, although studies suggest a number of unique issues experienced by rural nurses that differ significantly from their urban counterparts (Paliadelis et al., 2012) and rural nurses' consistent description of the complex nature of their work (Barrett et al., 2016; Knight et al., 2016). CC in nursing practice will not disappear (Weydt, 2009).

If the realities of rural nursing can be better understood through the lens of CC and a consideration of RNT, what are the implications of this understanding? If CC is consistent with rural nursing practice, an understanding of this should promote significant discussion and collaboration among nurses, administrators, educators, and policy makers in creation of better rural work environments and improved educational opportunities for rural nurses to support delivery of quality services and improvement in health outcomes among rural residents.

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