Nursing Care Processes

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Introduction

Healthcare professions have a social contract with the public as they exist for the sole purpose of serving the public good (ANA 2010). This contract requires that healthcare professions engage in self-regulation to ensure quality performance. Therefore, each discipline has a social mandate to evaluate the effect of their respective interventions on health outcomes. In the current value-based purchasing climate, reimbursement for services/interventions is tied to quality (see Chaps. 2 and 14). Thus, the healthcare disciplines also have an economic imperative to measure and evaluate the effect of interventions on health outcomes.

Nurses play a significant role in the delivery and coordination of care activities within and across healthcare teams. Consequently, there are few care elements that do not pass through nurses' hands, and few client outcomes that are not influenced by nursing care processes (Jones 2016). This chapter focuses on interventions and their measures that may help evaluate the unique nursing contribution to quality healthcare. The chapter begins with how nursing interventions are conceptualized within the QHOM (Mitchell et al. 1998), followed by discussions of the challenges in defining, measuring, and evaluating nursing interventions. System characteristics' effects on nursing intervention are described. Additionally, two exemplars of nursing interventions, nurse surveillance and symptom management, are discussed. Finally, implications and future directions are described.

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M. Baernholdt, D. K. Boyle (eds.), *Nurses Contributions to Quality Health Outcomes*, https://doi.org/10.1007/978-3-030-69063-2_9

Nursing Care Processes: Linkages to QHOM

The QHOM places nursing interventions as directed at the system, the client, or both to affect outcomes (Fig. 9.1). The proposed relationships in the QHOM are congruent with the theoretical perspectives reflected in ecological system frameworks (Bronfenbrenner 2005; Jones et al. 2019b, in press) and structuration theories (Baber 1991; Bodilica et al. 2015; Giddens 1984; Stone 2005). From the lens of an ecological system, nursing care is embedded within a multilevel system, e.g., macro-, meso-, and microlevels (Serpa and Ferreira 2019). Each system level may have multiple subsystems that affect and are affected by other subsystems. Moreover, the system is a social system comprised of social structures (i.e., rules, norms, policies, and relationships) within which individual nurses deliver care for clients or act to change the system. Adding to this view is social structures and human agency from a structuration framework (Giddens 1984). Social structures are created by human action, yet social structures also function to constrain or enable human action once created. Human agency involves intentional actions. Interdependent structure-agency relationships support multiple pathways of nursing intervention. Nurses may exert agency to deliver client-level interventions (individuals, families, and communities) to improve health outcomes. However, social structures across various subsystems may affect how the nurse enacts these interventions or how clients receive them. Nurses may also exert agency to deliver system-level

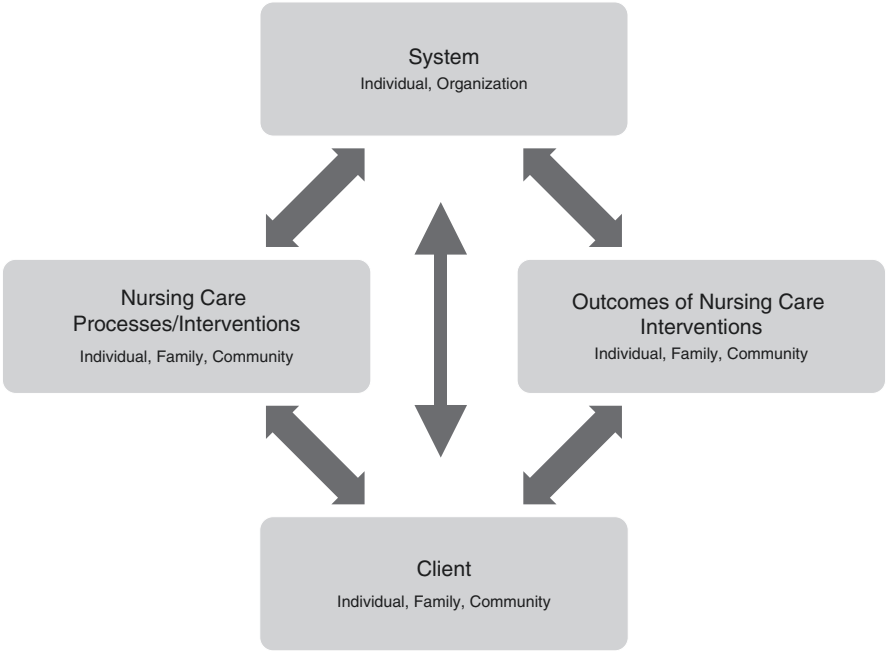

Fig. 9.1 Framework for nursing care processes/interventions

interventions. Through system-level interventions, nurses seek to create or adapt social structures to enable rather than constrain interventions related to health promotion, prevention of illness and injury, alleviation of suffering, and client advocacy. However, a first step is to define what nursing interventions are.

The Essence of Nursing Interventions

In the context of improvement initiatives related to nursing care quality, i.e., the extent to which nursing care improves patient outcomes, a discipline-specific definition of interventions or processes is needed. Such a definition must address what distinguishes a nursing intervention from the myriad of other interventions directed toward patients or the system of care from the healthcare team. The definition of a nursing intervention should ideally reflect the roles and responsibilities of nursing: (a) the *discipline of nursing* (i.e., the science of nursing—what nurses are educated to do), (b) the *profession of nursing* (i.e., the legal scope of nursing practice—what nurses are licensed to do), and (c) the *job of nursing* (i.e., the work of nursing—what nurses are paid to do). However, nursings' roles and responsibilities are continuously evolving, and these aspects of nursing are not always aligned. For example, in the current work environment, nurses may not be practicing at the full extent of their training and license. At the same time, they may be assigned and paid to perform activities that have nothing to do with the science or profession of nursing (e.g., clerical duties or passing meal trays). Moreover, as a result of scientific advancements and changes in delivery systems, nurses play an increasing role in monitoring physiologic health and coordinating services across settings. Therefore, the demarcation line between nursing and non-nursing interventions is not always clear and is never static.

Snyder et al. (1996) highlighted key challenges and contentious issues in defining nursing interventions in their review of national and international nursing intervention initiatives. The interrelated issues of active intervention and nurse autonomy have been points of disagreement within the discipline. In the 1990s, the International Council of Nursing (ICN) initiated the International Classification in Nursing Project (ICNP) and put forth the following statements regarding the definition of nursing interventions:

> Intervention means literally "a coming between" the patient and the problem in order to modify or influence the problem; the word implies active interference, and the phrase "nursing intervention" may therefore appear to be limited to treatments and procedures (ICN 1993, p. 110).

Other prominent scholars at the time similarly defined nursing interventions as actions performed by nurses to achieve patient outcomes (Gordon 1987; Snyder 1992; Snyder et al. 1996). Based on these statements, some argued that activities related to assessment and evaluation do not qualify as nursing interventions. The argument's basis was twofold: (1) assessment does not directly achieve an outcome

and (2) many assessments are prescribed by physicians and therefore fall into the category of *delegated medical functions* (Snyder et al. 1996). In other words, just because a nurse does it does not make it *nursing* or an *intervention*. Moreover, this perspective limited nursing interventions to active treatments that can be autonomously initiated by nurses.

In contrast, a less restrictive definition emerged from the National Intervention Classification (NIC) project (McCloskey and Bulechek 1992). The following statements from the NIC project acknowledge autonomous and nonautonomous aspects of nursing practice:

> Any direct care treatment that a nurse performs on behalf of a client. Nursing interventions include nurse-initiated treatments and physician-initiated treatments (McCloskey and Bulechek 1992, p. xvii).

Despite the reference to *direct care treatment*, the inclusion of activities related to assessment and evaluation in the initial list of 332 nursing interventions suggests a liberal interpretation of the term *treatment*. The NIC definition has subsequently been refined as "*any* treatment, based upon clinical judgement and knowledge, that a nurse performs to enhance patient/client outcomes" (Butcher et al. 2018, p. xii). Notably, the current NIC taxonomy includes 565 nursing interventions that reflect all aspects of the nursing process, direct and indirect care activities (e.g., activities related to managing the environment and interdisciplinary collaboration), and elements of autonomous and nonautonomous practice.

Despite the absence of a universally accepted definition of a nursing intervention, there does seem to be some consensus around the idea that nurses function within three general role categories: dependent, independent, and interdependent (Table 9.1). The classification of nursing roles and functions into these categories is described further in the Nursing Role Effectiveness Model (NREM), first introduced by Irvine et al. (1998) and refined by Doran (2011). The types of interventions for which nursing is duty bound to measure and manage are inherent in the very definition of nursing, "*the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the*

Table 9.1 Broad categories of nursing interventions/processes

Independent nursing practice	Interdependent nursing practice	Dependent nursing practice
Role functions and responsibilities for which only nurses are held accountable	Role functions and responsibilities in which nurses engage that are partially or totally dependent on the functions of other healthcare professionals	Role functions and responsibilities associated with the implementation of medical orders and medical treatments
Examples include the activities of assessment, decision-making, intervention, and follow-up	Examples include coordination of care	Examples include implementation of standing orders

diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations" (ANA 2010, p. 8). Therefore, nursing is accountable for and obligated to measure independent, interdependent, and dependent nursing practice interventions.

The Complexity of Nursing Interventions

Nursing interventions often fall into the category of complex interventions (MRC 2006). Interventions are considered complex when they have several interacting or interdependent components (Bleijenberg et al. 2018; Craig et al. 2013; MRC 2006). The presence of multiple interdependencies adds to the length and complexity of the causal chain that links the intervention to outcomes. Additional challenges that emerge from this complexity include the difficulty in standardizing the intervention's delivery and the significant influence of the local context (i.e., system and social structures). Consequently, it is often difficult to identify the active ingredients in complex interventions and evaluate their effectiveness. The implementation of rapid response teams (RRTs) is a prime example of an organization- or system-level nurse-driven complex intervention.

Example: Rapid Response Teams

The RRT is an intervention designed to improve detection and management of clinical deterioration for hospitalized patients outside the intensive care unit (ICU). The RRT intervention contains two primary arms that support the cognitive and behavioral aspects of nurse surveillance. The afferent arm, or active arm, of the RRT intervention includes collecting and interpreting data points predictive of clinical deterioration. The efferent or the response arm is the deployment of the RRT to the bedside of deteriorating patients and the subsequent diagnosis and management of those patients (Jones et al. 2011).

Multiple interdependencies (among activities and people) and active ingredients are involved in the RRT intervention. For example, appropriate activation of the response arm depends on accurate and timely identification of clinical deterioration in the active arm. Consequently, the RRT intervention includes at a minimum all of the following: timely collection and documentation of relevant assessment data; staff competent in clinical reasoning and pattern recognition; designated RRT members; a mechanism for rapid notification of the RRT; effective team communication; and structural empowerment of the RRT to order and execute interventions to reverse clinical deterioration once activated.

Each interdependency within the RRT intervention presents an area of vulnerability to breakdown and is potentially influenced by human factor limitations and system or social structures. For example, work overload, distractions, and disruptions may delay collecting and interpreting relevant data. In competitive and hierarchical cultures, staff may hesitate to activate the RRT for fear of being perceived as weak and incompetent or overstepping disciplinary boundaries. Moreover, biases toward quantitative data may cause nurses to delay activation of the RRT until

significant vital sign changes emerge despite earlier changes in more qualitative cues, such as patient affect. Once the RRT is deployed to the bedside, treatment execution may be impeded by disagreements between the RRT and the patient's primary providers. Thus, the mechanism of action for the RRT intervention is long and convoluted. Timely data collection and interpretation by nurses in the afferent arm may not result in the activation of the efferent arm. Moreover, timely activation of the efferent arm may not result in timely clinical stabilization. In other words, a successful RRT intervention is contingent upon system characteristics.

System Characteristics' Effect on Nursing Interventions

The bidirectional interactions between the client, system, and interventions in the QHOM suggest that changes in one are contingent upon support or changes in the other. For example, client-level interventions are the product of social structures within the system, and system-level interventions are the mechanisms through which nurses transform the system. Therefore, the nature and effectiveness of client-level interventions are contingent upon system characteristics. Moreover, this contingency implies that client-level interventions cannot be improved without synergistic system-level interventions in many instances. These contingencies are evident in the Nursing Care Performance Framework proposed by Dubois et al. (2013) and empirically supported by the science of unfinished nursing care.

Unfinished Nursing Care

In the Nursing Care Performance Framework, Dubois et al. (2013) described three functional nursing subsystems to include: "(1) acquiring, deploying and maintaining nursing resources, (2) transforming nursing resources into nursing services, and (3) producing positive changes in a patient's condition as a result of nursing services" (p. 6). The first subsystem includes the structures and processes involved in generating the supply of nursing staff (e.g., volume and skill mix) and working conditions (e.g., workload and scheduling). The second subsystem includes individual nurses applying the nursing process to deliver client-level interventions. The output of the first subsystem (the supply of nurses) clearly serves as the second subsystem's input. When the supply of nurses is insufficient relative to care and work demands, nurses are unable to effectively execute client-level interventions. This phenomenon appears in the literature as *unfinished nursing care*. The output of the second subsystem (unfinished nursing care) subsequently functions as one input into the third subsystem and contributes to suboptimal patient outcomes.

The phenomenon of *unfinished nursing care* was first introduced in 2001 under the label *tasks left undone* (Aiken et al. 2001). By 2007, additional terms for the phenomenon began to appear in the literature with regularity to include *missed care* (Kalisch and Williams 2009) and *implicitly rationed care* (Schubert et al. 2007). The findings of an early state of the science review suggested that these terms were

being used to reflect a common underlying phenomenon. The term *unfinished nursing care* was introduced to serve as a unifying umbrella term (Jones et al. 2015). The common phenomenon was defined as *"a problem of time scarcity that prompts nurses to engage in implicit rationing of care through the process of clinical prioritization that results in care left undone"* (Jones et al. 2015). Internationally, 55–98% of nursing staff surveyed report leaving one or more nursing care elements unfinished (Al-Kandari and Thomas 2009; Ausserhofer et al. 2013; Schubert et al. 2013). In other words, at least 55% of hospitalized clients may not receive all needed nursing interventions. Moreover, variations in levels of unfinished nursing care have been documented at the hospital and unit level across the United States (Jones 2014; Kalisch et al. 2011, 2012; Kalisch and Lee 2010). Time scarcity due to inadequate human resources remains the strongest identified predictor of unfinished nursing care.

Examples of Nursing Interventions

In the following section, two examples of crucial nursing interventions are reviewed, and potential performance measures useful for quality assessment and performance improvement are discussed. The two examples include surveillance and symptom management. Both represent essential and complex nursing interventions that are rarely provided entirely by a single nurse. Consequently, both are vulnerable to the effects of system characteristics. Therefore, both the client- and system-level aspects of the intervention are discussed.

Surveillance

Robust conceptualizations of surveillance as a nursing intervention are described by Titler (1992), Doughtery (1999), McCloskey and Bulechek (2000), Schoneman (2002), Kutney-Lee et al. (2009), Schmidt (2010), Kelly and Vincent (2010), Dresser (2012), and Pfrimmer et al. (2017). These conceptualizations are highly congruent with the following definition: "a process to primarily identify threats to patient health and safety through purposeful and ongoing acquisition, interpretation and synthesis of patient data for clinical decision making" (Kelly and Vincent 2010, p. 658). This definition underscores the applicability of the intervention of surveillance to all patient populations and care settings. Moreover, it suggests that surveillance is a precursor to clinical decision-making and, as such, may be foundational to all other interventions. Two published concept analyses (Dresser 2012; Kelly and Vincent 2010) clearly situate surveillance as a complex intervention. The intervention of nurse surveillance is designed to promote health and prevent injury through two primary mechanisms: early detection of clinical deterioration and early intervention.

Early detection of clinical deterioration begins with the timely acquisition of relevant patient data. Nurses may gather data by direct observation, communication

with others (e.g., patients, family members, and other members of the care team), review of electronic and paper health records, and retrieval of data from electronic devices (e.g., medical equipment). Following data acquisition, nurses use cognitive processes (rational and intuitive thinking) to interpret the data and synthesize the information gleaned. Nurses then judge the meaning of the information in relation to the trajectory of the patient's clinical status (i.e., improving, unchanged, or deteriorating) and the degree of risk for injury. Based on their judgments, nurses make decisions related to the appropriate course of action (e.g., immediate intervention or continued surveillance).

System-Level Interventions to Support Surveillance

The complexity of today's healthcare environment presents many challenges to effective nurse surveillance. Advances in science and technology have significantly increased the volume of patient data available to support surveillance and the range of available treatment options for clinical deterioration. Nurse staffing is further constrained by economic imperatives to reduce costs, often resulting in increased workloads for individual nurses (see Chaps. 3, 4, and 13). Consequently, the human capacity for information processing is often insufficient to meet nurse surveillance's cognitive demands (Chap. 5). Moreover, healthcare teams have grown in size and diversity due to increased specialization and emerging delivery models. Thus, communication of information generated during the surveillance process to multiple team members can be cumbersome and time consuming. Therefore, system-level interventions involving the adoption of various tools and aids (protocols, information technology (IT), and rounding) are often used to overcome these challenges and improve client-level surveillance capacity.

Complication-specific screening and risk assessment tools are used to support the cognitive and behavioral components of surveillance. These tools typically contain a list of data elements required to assess the risk for specific complications. The lists serve as prompts for data gathering to ensure that the right data are collected, which reduces reliance on nurse memory and prior experience. Screening tools also include scoring systems developed with predictive analytics to facilitate the information processing required for timely and accurate interpretation of multiple data points. Often a single composite score is generated, and cut points indicate varying degrees of risk for specific complications. In some instances, treatment protocols are developed and standardized based on these risk scores. These system-level protocols guide the clinical decision-making and execution components of surveillance. The effectiveness of these tools is enhanced when they are embedded in health IT systems such as the electronic health record (EHR). Digital documentation combined with artificial intelligence algorithms supports the automatic computation of risk scores and the generation of evidence-based treatment recommendations.

Additional IT aids to support *remote* surveillance include electronic sensors and video monitoring equipment. These IT modalities support the data gathering component of surveillance by enabling continuous and automated client observation without a nurse's presence at the bedside, for example, beds equipped with electronic sensors that detect pressure changes associated with patients getting out of

bed (Graham 2012; Hempel et al. 2013; Sahota et al. 2014) and cameras (Votruba et al. 2016). These surveillance technologies are also being deployed to care settings outside the acute care setting (Fisk 2015) (see Chap. 6).

Rounding is another system-level intervention often used to enhance nurse surveillance. Various types of rounding appear in the literature: intentional, proactive surveillance, and interprofessional. Rounding involves planned interactions for specific purposes. These planned interactions are routinized and habituated by creating social structures (e.g., policies, protocols, and documented workflows). Emphasis on early detection and early intervention to enhance patient safety and prevent adverse events is implicit in each type of rounding's definitions and descriptions. For example, intentional rounding (also known as hourly rounding, purposeful rounding, scripted rounding, and proactive nurse rounding) is described as regular checks of individual patients at set intervals to proactively assess and attend to patient needs (Al Danaf et al. 2017; Christiansen et al. 2018; Forde-Johnston 2014; Gonzolo et al. 2014; Harrington et al. 2013; Hutchinson et al. 2017; Mitchell et al. 2014; Sims et al. 2018).

Proactive surveillance rounding evolved as an adjunct to another system-level surveillance-related intervention, RRTs (Danesh et al. 2019). As described previously, RRTs were designed to facilitate early detection and intervention for clinical deterioration outside the ICU. Building on an RRT presence, a dedicated and centrally located surveillance team, often the same as the RRT, does proactive surveillance rounds. The surveillance team prospectively reviews the automated (and continuously updated) early warning scores for all patients in the organization. The team will be deployed to the bedside of patients with concerning risk profiles to intervene as indicated. Finally, interprofessional rounding is planned encounters between the care team members to discuss patient status and develop, evaluate, and revise the treatment plan. Emphasis is placed on shared information and shared decisions (Gonzalo et al. 2016; Henneman et al. 2012). In summary, protocols, IT, and rounding are system-level interventions used for client-level surveillance, but more needs to be done to improve patient health and safety.

Measuring and Evaluating Surveillance Interventions

The challenges to the empirical measurement of surveillance are similar to other complex interventions. Surveillance is not easily dichotomized as present or absent, or good or bad. In the purest sense, surveillance is present and good when the *five rights* of the process are present: right data, time, judgment, decision, and execution. Each of these rights is temporally and contextually dependent. Patients present with different risk profiles based on their health history (past and present), nursing and medical diagnoses, treatment regimens, genetic makeup, social support, and socioeconomic status. Consequently, they are at risk for different types of clinical deterioration and injury. Therefore, variation is expected in the type and frequency of data collection and the interpretation of data values across patients. For example, data requirements for a postoperative patient are different than for a woman in labor. Moreover, the correct judgment and decision about an elevated temperature on postoperative day 1 are different from postoperative day 7.

Patient data may be obtained and documented by multiple clinicians and technology aids. However, recording a data point does not guarantee that a nurse will see or interpret that data. Similarly, the sounding of an alarm or the flashing of an alert does not guarantee that risk is accurately or expediently recognized. Thus, a high quantity of recorded data and high alarm and alert utilization are not synonymous with good surveillance. Measuring data volume only captures one of the active ingredients of this complex intervention (Jones 2011). Good surveillance is contingent upon all of the active ingredients to include good judgment and decision-making. These cognitive processes reflect the mental work of nurses. A nurse may accurately interpret the gathered data, but unless the resulting judgment is communicated, this mental work remains invisible and unmeasurable.

Quantitative measures are reductionistic by nature and typically only capture a snapshot in time. A snapshot measure's timing may or may not accurately reflect the quality of a whole dynamic process. For example, a nurse may be quite vigilant in surveillance in the morning but less so in the afternoon. Similarly, multiple nurses provide surveillance for each patient during an episode of care, and they may do so with varying degrees of vigilance. Poor surveillance when a patient's condition is unchanged means something very different from poor surveillance when clinical deterioration is in progress. Poor surveillance can be the difference between a good and a bad outcome at any single point in time. Thus capturing the timing of surveillance is as crucial as the quantity of surveillance.

Because of the inherent measurement challenges, indirect or proxy measures for surveillance are often used. The Hospital Nurse Surveillance Capacity Profile (Kutney-Lee et al. 2009) is an example of a proxy measure for surveillance based on structural factors that theoretically influence nurse surveillance. As the name implies, it is not a measure of the *actual* volume or quality of nurse surveillance; instead, it measures an organization's *capacity* for nurse surveillance. The authors of the measure asserted that the cumulative and temporal aspects of surveillance preclude the ability to associate the surveillance effectiveness by a single nurse with a single patient's outcome. Moreover, they conceptualized surveillance as "a collective effort of interventions delivered by multiple nurses over time, as well as interventions by individual nurses" (Kutney-Lee et al. 2009, p. 219). Therefore, they developed an organization-level measure comprised of nurse characteristics (nurse staffing, nurse education, nurse clinical experience, and nurse experience) and practice environment. The variables included in the profile were selected based on previous evidence linking them to patient outcomes. Though nurse surveillance is often hypothesized to be part of the causal chain linking these variables to patient outcomes, these relationships have not been empirically validated.

Data required to compute the Hospital Nurse Surveillance Capacity Profile are obtained from self-reported nurse surveys. Survey data are aggregated at the hospital level, and hospitals are ranked separately for each variable. The final profile consists of the individual variable rankings and a composite score computed as the mean across the individual rankings. The authors demonstrated significant relationships between surveillance capacity scores and two adverse events (injury falls and nosocomial infections). The Hospital Nurse Surveillance Capacity Profile's intended

uses include identifying areas for organizational improvement, tracking organizational performance over time, and benchmarking organizational performance against comparable institutions.

Examples of adverse patient outcomes commonly used as proxy measures for nurse surveillance in the acute care practice setting include failure to rescue (Clarke and Aiken 2003; Needleman and Buerhaus 2007) and care escalations (Danesh et al. 2019). Both outcomes are conceptually characterized as failures of early detection and intervention practices (Danesh et al. 2019; Mushta et al. 2018). Failure to rescue is endorsed by the National Quality Forum (NQF 2004) (see Chaps. 2 and 14). This measure is extracted from administrative databases that include diagnostic codes for complications and iatrogenic injury and discharge status. A care escalation is defined as the unplanned transfer from a lower level of care (e.g., acute care unit) to a higher level of care (e.g., intensive care unit) regardless of outcome (death or survival). Moreover, the care escalation measure does not require documentation of specific complications and can be extracted from administrative databases that include charge management fields related to bed type (Danesh et al. 2019).

High rates of failure to rescue and care escalation are presumed to result from poor surveillance; however, empirical evidence to validate this presumption is lacking. While consistent evidence links failure to rescue with care structures theoretically linked to surveillance (e.g., nurse staffing and the previously described surveillance capacity profile), a direct link to actual nurse surveillance has not been empirically established. Shever (2011) is credited with the most robust attempt to directly link nurse surveillance and failure to rescue. The empirical measure of nurse surveillance in this study was limited to the data gathering component of nurse surveillance. Specifically, the measure included the frequency of documented surveillance activities related to assessment and monitoring documented in the EHR. Propensity scores were used to match patients who received high doses of nurse surveillance (an average of 12 or more surveillance activities per day) with patients who received low doses of surveillance (an average of less than 12 surveillance activities per day). The results supported a significant difference in the risk of failure to rescue among the two groups. Specifically, patients in the high-dose group had reduced odds of failure to rescue by about 50% (OR = 0.52) compared to patients in the low-dose group. The findings of this single study are promising but have not been replicated.

Symptom Management

Symptom management is acknowledged as an important *nurse-sensitive performance measure* (Bolton et al. 2007; Sidani 2011). Symptoms are defined as subjective sensations or experiences, reflecting perceived changes or abnormalities in one's biopsychosocial functioning (Sidani 2011). Thus, symptoms are part of the human response to diseases and their treatments. Symptom management involves a constellation of activities applied to ameliorate symptoms. Symptoms often prompt

individuals to seek healthcare and, if not managed effectively, contribute to the experience of suffering. Thus, symptom management is germane to nursing's role in alleviating suffering.

Any disease process can produce a high symptom burden and high symptom distress if uncontrolled. However, the risk for these and other associated adverse consequences is higher in patients with one or more chronic illnesses. An illness is considered chronic if it lasts more than 6 months, is not curable, and potentially limits activity (Bushor and Rowser 2015). In an acute illness, symptoms resolve with curative treatment, often during or shortly after the incident encounter (i.e., hospitalization or outpatient visit) under close clinician supervision. Thus, symptom management in acute illness is time limited and primarily falls under clinicians' purview in acute care settings. In contrast, patterns of recurring and remitting symptoms are an inherent aspect of chronic illness. Patients with chronic conditions experience symptom recurrence between traditional episodic care visits that are often separated by long stretches of time (see Chap. 8).

The symptom experience begins with symptom appraisal. In concert with the conscious awareness of one or more symptoms, individuals engage in an evaluation process to assign meaning to the experience. Meaning is derived based on a client's perceived symptom characteristics of severity, frequency, duration, timing, and impact on daily life. Responses to symptoms stem from the assigned meaning and include physiological (e.g., stress), emotional (e.g., anxiety), and behavioral components. The presence of a behavioral response signifies a transition from symptom experience to symptom management. During symptom management, clients act alone or in concert with others to "avert, delay, or minimize the symptom experience" (Humphreys et al. 2008, p. 144). Sidani (2011) described the range of symptom management strategies employed by clients as follows:

> Patients may ignore the symptom; assume a "wait and see" attitude; seek advice from laypersons (i.e., family members and friends), from available resources (e.g., the World Wide Web), or healthcare professionals; use commonly recommended strategies, home remedies, or alternative therapies; and apply self-initiated treatment based on common knowledge (e.g., over-the-counter medications), or previous experience (p. 134).

The outcomes or consequences of symptom management are multidimensional and interrelated. The most direct outcome is symptom status that reflects the degree of symptom control achieved. Symptoms may be completely controlled (i.e., eliminated and no longer experienced), partially controlled (i.e., reduced in frequency, severity, or impact), or uncontrolled (i.e., remaining the same or worsening in frequency, severity, or impact). Prolonged partially and uncontrolled symptoms have multiple adverse effects that may manifest as limited functional status, reduced health-related quality of life, comorbidity, symptom distress, symptom burden, increased healthcare utilization and costs, and mortality. Symptom status functions as a feedback loop to evaluate the effectiveness of symptom management.

Similar to surveillance intervention, early detection and early intervention are fundamental aspects of symptom management. Early detection of symptoms is comparable to the early detection of clinical deterioration as described for the

surveillance intervention. Nurses use cognitive processes to determine which symptoms or symptom clusters are most relevant based on their knowledge of diseases, treatments, and client characteristics. Nurses then decide appropriate symptom management interventions and engage other cognitive and behavioral processes to execute the decisions. Symptom profiles vary by condition, and different symptoms require different preventive and management approaches. Moreover, clients present with varying levels of knowledge and motivation for self-care and self-management. Therefore, these actions must be tailored to each client's context.

System-Level Interventions to Support Symptom Management

The complexity of today's healthcare environment presents many challenges to effective symptom management in chronic illness. System characteristics that facilitate client-level symptom management are often inadequate. In response to reimbursement policies' economic constraints, increasingly more emphasis is placed on early discharge from inpatient encounters with the transition of more care to the post-acute setting. Although acute care nurses may be positioned to *initiate* symptom management, they cannot see this intervention through to fruition. For example, they may begin client education based on the initial symptom profile, but they are unlikely to evaluate symptom management behaviors before discharge. This evaluation should happen in the post-acute care setting. The handoff and communication processes for nursing care related to symptom management between acute and post-acute settings are suboptimal (see Chap. 11). In the post-acute care setting, patients with chronic illness often require treatment from multiple health professionals across multiple subspecialties. Roles and responsibilities for symptom management may not be clearly delineated, and nurses across settings may be unable to access each other's care documentation related to symptom management. This lack of access hinders continuity of symptom management care across practice settings. Moreover, in post-acute settings, staffing models do not always support sufficient nurse staffing and time allocation for symptom management activities (Jones et al. 2019a).

A variety of system-level interventions to better support symptom management continue to emerge. Examples of care delivery models that may provide improved support for symptom management include those with designated patient homes (Colligan et al. 2017; Kuntz et al. 2014), nurse-led disease management and symptom management clinics (Henry et al. 2013; Whitmer et al. 2011), nurse care coordinators (Mkanta et al. 2007), nurse navigators (Bellomo 2016; Hébert and Fillion 2011; Jeyathevan et al. 2017), and case managers (Aiken et al. 2006; Li et al. 2017). These models represent adaptations to larger system structures to enable improved care integration across settings and designated nurses for post-acute symptom management (see Chap. 11).

Access to provider documentation across settings related to symptom management is improved through the adoption of EHRs (Kallen et al. 2012; O'Malley et al. 2015). The impact of EHRs on symptom management is further enhanced by integrating standardized symptom surveillance surveys and evidence-based symptom management protocols. Patient-reported outcome measures (PROMs) are

standardized measures of physical symptoms that providers can complete during history taking or by the patient before the provider encounter (Stover et al. 2019; Yang et al. 2018). These tools serve as prompts to ensure complete and consistent symptom appraisal and promote patient-clinician communication about symptom management strategies (Hinami et al. 2016; Santana and Feeny 2014). Moreover, longitudinal data from these tools provide feedback for clinicians and clients regarding the effectiveness of selected symptom management strategies.

Evidence-based symptom management protocols and practice guidelines help nurses identify best practices to manage specific symptoms and can be embedded in clinical decision support systems to expedite the process further. For example, pain management protocols may automatically pop up when the symptom of pain is documented in the EHR. Moreover, in conjunction with telehealth and mobile health technologies, such standardized protocols are used to support remote symptom management (Beck et al. 2017; Breen et al. 2015). In summary, new care delivery models, sharing of client data across care settings, and symptom management protocols are all system-level interventions that will improve client health if implemented widely.

Measuring Symptom Management

The challenges to the empirical measurement of symptom management are similar to other complex interventions, such as those described previously in this chapter. Moreover, symptom management is conceptualized as both process and outcome (Bolton et al. 2007; Richard and Shea 2011; Sidani 2011). Symptom management as a process includes the previously described activities related to symptom appraisal and behavioral response. Whereas symptom management as a health outcome is the extent to which symptoms are effectively managed, the process of symptom management is not easily dichotomized as present or absent, or good or bad. In the purest sense, symptom management is present and good when all of the active ingredients are performed correctly and timely. Ideally, measures of symptom management should address all components of the intervention. Symptom management strategies should be matched to symptom profiles. Therefore, a universal measure of symptom management for all patients is unlikely. Rather, population-specific measures may be more useful.

Implications and Future Directions

This chapter established system-level and client-level nursing interventions as foundational to the healthcare system and highlighted key interdependencies between them. Consequently, data about nurses, systems, and nursing interventions are essential to support robust quality assessment and performance improvement initiatives leading to improved healthcare outcomes. This chapter also established that nursing interventions are complex and associated with inherent challenges to

standardization and measurement. Given the importance of robust nurse intervention measures to quality assessment and performance improvement, quality scholars must work strategically to overcome these challenges and develop a comprehensive set of valid and reliable nurse intervention measures to examine the nursing contribution to quality patient care. In order to achieve this goal, quality scholars must be skilled in the science of complex interventions. The Medical Research Council (MRC), based in the United Kingdom, is an excellent resource in this area. The MRC provides free access to many educational materials on their web site to include their widely referenced guidance, *Developing and Evaluating Complex Interventions* (MRC 2006). Scholars with skills in this area will be more equipped to identify the active ingredients for complex nursing interventions, explicate their mechanisms of action, and determine the system structures required for effective execution. These steps are foundational to the development of the interventions themselves and are also foundational to the development of associated empirical measures.

Quality scholars must also know the criteria for effective performance measures and the process for endorsement of measures by the National Quality Forum (NQF). NQF provides free access to related educational materials on their web site (https://www.qualityforum.org/Measures_Reports_Tools.aspx). Quality scholars with skills in this area will be more equipped to develop nurse intervention measures that provide meaningful data for quality assessment and performance improvement initiatives. Moreover, measures that achieve NQF endorsement criteria are more likely to be widely adopted. Wide adoption leads to increased measurement consistency and a more robust evidence base for performance evaluation and benchmarking across care settings.

Quality scholars must also be skilled in extracting data about nurses and nursing interventions in existing clinical and operational databases. Despite the lack of standardized nursing care intervention measures, increasingly more data about nurses and nursing care interventions are collected. However, these data are often not captured using standardized definitions. They reside in disparate databases designed to support local operational departments (e.g., human resources, payroll, health records and billing, finance, and EHRs) (Huber et al. 1992). The feasibility of using existing data is dependent upon access to data science resources. Therefore, quality scholars must include colleagues with data science skills to expand the capacity of improvement teams to efficiently extract meaningful information related to nursing interventions and health outcomes. These cross-functional teams must collaborate to develop and define quality metrics and implement strategies to standardize procedures for data collection, extraction, harmonization, and analysis. Without a substantial investment in data science resources across health systems, it is unlikely that a robust set of quality metrics sensitive to nursing care will be developed or adopted. Ultimately, this limits nursing's capacity for the meaningful examination of practice, self-regulation, and validation of our unique contribution to quality healthcare.

References

Aiken LH, Clarke SP, Sloane DM, Sochalski JA, Busse R, Clarke H et al (2001) Nurses' reports on hospital care in five countries. Health Aff 20(3):43–53. https://doi.org/10.1377/hlthaff.20.3.43

Aiken LS, Butner J, Lockhart CA, Volk-Craft BE, Hamilton G, Williams FG (2006) Outcome evaluation of a randomized trial of the PhoenixCare Intervention Program: program of case management and coordinated care for the seriously chronically ill. J Palliat Med 9(1):1–126

Al Danaf J, Chang BH, Shaear M, Johnson KM, Miller S, Nester L, Williams AW, Aboumatar HJ (2017) Surfacing and addressing hospital patients' needs: proactive nurse rounding as a tool. J Nurs Manag 26:540–547

Al-Kandari F, Thomas D (2009) Factors contributing to nursing task incompletion as perceived by nurses working in Kuwait general hospitals. J Clin Nurs 18:3430–3440. https://doi.org/10.1111/j.1365-2702.2009.02795

American Nurses Association (ANA) (2010) Nursing's social policy statement: the essence of the profession. Nursebooks.org, Silver Spring, MD

Ausserhofer D, Zander B, Busse R, Schubert M, Rafferty AM, Schwendiamann R (2013) Prevalence, patterns and predictors of nursing care left undone in European hospitals: results from the multicountry cross-sectional RN4CAST study. Br Med J Qual Saf 23:126–135. https://doi.org/10.1136/bmjqs-2013-002318

Baber Z (1991) Beyond the structure/agency dualism: an evaluation of Giddens' Theory of Structuration. Sociol Inq 61(2):219–230

Beck SL, Eaton LH, Echeverria C, Mooney KH (2017) SymptomCare@Home. Developing and integrated symptom monitoring and management system for outpatients receiving chemotherapy. CIN: Comput Informat Nurs 35(10):520–529

Bellomo C (2016) Oral chemotherapy: patient education and nursing intervention. J Oncol Nurs Soc Online 7(6):20–27

Bleijenberg N, de Man-van Ginkel JM, Trappenburg JCA, Ettema RGA, Sino CG, Heim N, Hafsteindóttir TB, Richards DA, Schuurmans MJ (2018) Increasing value and reducing waste by optimizing the development of complex interventions: enriching the development phase of the Medical Research Council (MRC) Framework. Int J Nurs Stud 79:86–93

Bodilica V, Spraggon M, Tofan G (2015) A structuration framework for bridging the macro-micro divide in healthcare governance. Health Expect 19:790–804

Bolton LB, Donaldson NE, Rutledge DN, Bennett C, Brown DS (2007) The impact of nursing interventions. Overview of effective interventions, outcomes, measures, and priorities for future research. Med Care 64(2):123S–143S

Breen S, Ritchie D, Scholfield P, Hsueh Y, Gough K, Santamaria N, Kamateros R, Maguire R, Kearney N, Arandia S (2015) The patient remote intervention and symptom management system (PRISMS)—a telehealth-mediated intervention enabling real-time monitoring of chemotherapy side-effects in patients with haematological malignancies: study protocol for a randomised controlled trial. Trials 16(472):1–17

Bronfenbrenner U (ed) (2005) Making human beings human: bioecological perspectives on human development. Sage Publications, Thousand Oaks, CA

Bushor L, Rowser M (2015) Symptom management of chronic illness in the adult outpatient setting. J Hosp Palliat Nurs 17(4):285–290

Butcher HK, Bulechek GM, Dochterman JM, Wagner CM (eds) (2018) Nursing interventions classification (NIC), 7th edn. Elsevier, St. Louis, MO

Christiansen A, Coventry L, Graham R, Jacob E, Twigg D, Whitehead L (2018) Intentional rounding in acute care adult healthcare settings: a systematic mixed methods review. J Clin Nurs 27:1759–1792

Clarke SP, Aiken LH (2003) Failure to rescue. Am J Nurs 103:42–47

Colligan EM, Ewald E, Keating NL, Parashuram S, Spafford M, Ruiz S, Moiduddin (2017) Two innovative cancer care programs have potential to reduce utilization and spending. Med Care 55:873–878

Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Pettigrew M (2013) Developing and evaluating complex interventions: the new medical council guidance. Int J Nurs Stud 50:585–592
Danesh V, Neff D, Jones TL, Arorian K, Unruh L, Andrews D, Guerrier L, Venus SJ, Jimenez E (2019) Can proactive rapid response team rounding improve surveillance and reduce unplanned escalations in care? A controlled before and after study. Int J Nurs Stud 91:128–133
Doran DM (ed) (2011) Nursing outcomes. State of the science, 2nd edn. Jones & Bartlett Learning, Sudbury, MA
Doughtery DM (1999) Surveillance. In: Bulechek GM, McCloskey JC (eds) Nursing interventions: effective nursing treatments, 3rd edn. Saunders., Philadelphia, PA, pp 524–532
Dresser S (2012) The role of nursing surveillance in keeping patients safe. J Nurs Adm 42(7/8):361–368
Dubois CA, D'Amour D, Pomey MP, Girard F, Brault I (2013) Conceptualizing performance of nursing care as a prerequisite for better measurement: a systematic and interpretative review. BMC Nurs 12:7. https://doi.org/10.1186/1472-6955-12-7
Fisk MJ (2015) Surveillance technologies in care homes: seven principles for their use. Work Older People 19(2):51–59
Forde-Johnston C (2014) Intentional rounding: a review of the literature. Nurs Stand 28(32):37–42
Giddens A (1984) The constitution of society: introduction of the theory of structuration. University of California Press, Berkley, CA
Gonzalo JD, Himes J, McGillen B, Shifflet V, Lehrman E (2016) Interprofessional collaborative care characteristics and occurrence of bedside interprofessional rounds: a cross-sectional analysis. BMC Health Serv Res 16(459):1–9
Gonzolo JD, Kuperman E, Lehman E, Haidet P (2014) Bedside interprofessional rounds: perceptions of benefits and barriers by internal medicine nursing staff, attending physicians, and house staff physicians. J Hosp Med 9(10):646–651
Gordon M (1987) Nursing diagnoses. McGraw-Hill, New York
Graham BC (2012) Examining evidence-based interventions to prevent inpatient falls. Medsurg Nurs 21(5):267–270
Harrington A, Bradley S, Jeffers L, Linedale E, Kelman S, Killington G (2013) The implementation of intentional rounding using participatory action research. Int J Nurs Pract 19:523–529
Hébert J, Fillion L (2011) Gaining a better understanding of the support function of oncology nurse navigators from their own perspective and that of people living with cancer: Part I. Canad Oncol Nurs J Winter:33–38
Hempel S, Newberry S, Wang Z, Booth M, Shanman R, Johnson B, Shier V, Saliba D, Spector WD, Ganz DA (2013) Hospital fall prevention: a systematic review of implementation, components, adherence, and effectiveness. J Am Geriatr Soc 61:483–494
Henneman EA, Gawlinski A, Giuliano KK (2012) Surveillance: a strategy for improving patient safety in acute and critical care units. Crit Care Nurse 32(2):e9–e18
Henry PCL, Man CA, Fung YS (2013) Effectiveness of nurse-led disease management programs on health outcomes and health service utilization in adult patients with chronic obstructive pulmonary disease: a systematic review protocol. Joanna Briggs Inst Datab Syst Rev Implement Rep 11(1):307–328
Hinami K, Alkhalil A, Chouksey S, Chua J, Trick WE (2016) Clinical significance of physical symptom severity in standardized assessments of patient reported outcomes. Qual Life Res 26:2239–2243
Huber DG, Delaney C, Mehmert M et al (1992) A nursing management minimum data set. Significance and development. J Nurs Adm 22(78):35–40
Humphreys J, Lee KA, Carrieri-Kohlman V et al (2008) Theory of symptom management. In: Smith MJ, Liehr PR (eds) Middle range theory for nursing. Springer Publishing, New York, pp 145–158
Hutchinson M, Higson M, Jackson D (2017) Mapping trends in the concept of nurse rounding: a bibliometric analysis and research agenda. Int J Nurs Pract 23:1–9
International Council of Nurses (ICN) (1993) Nursing's next advance: an international classification for nursing practice (ICNP). Author, Geneva, Switzerland

Irvine D, Sidani S, Hall LM (1998) Finding value in nursing care: a framework for quality improvement and clinical evaluation. Nurs Econ 16(3):110–131
Jeyathevan G, Lemonde M, Brathwaite AC (2017) The role of oncology nurse navigators in enhancing patient empowerment within the diagnostic phase for adult patients with lung cancer. Canad Oncol Nurs J 27(2):164–177
Jones TL (2011) A retrospective exploration of patient-ventilator monitoring intensity, therapeutic intervention intensity, and compliance with lung protective guidelines in a cohort of patients with adult respiratory distress syndrome. World Views Evid Based Nurs 8(1):40–50
Jones T (2014) Validation of the perceived implicit rationing of nursing care (PIRNCA) instrument. Nurs Forum 49(2):77–78
Jones TL (2016) What nurses do when time is scarce—and why. J Nurs Adm 46(9):449–454. https://doi.org/10.1097/NNA.0000000000000374
Jones DA, DeVita MA, Bellomo R (2011) Rapid-response teams. N Engl J Med 365(2):139–146
Jones T, Hamilton P, Murry N (2015) Unfinished nursing care, missed care, and implicitly rationed car: state of the science review. Int J Nurs Stud 52(6):1121–1137. https://doi.org/10.1016/jijnstu.2015.02.012
Jones T, Willis E, Amorim-Lopes M, Drach-Zahavy A (2019a) Advancing the science of unfinished nursing care: exploring the benefits of cross-disciplinary knowledge exchange, knowledge integration and transdisciplinarity. J Adv Nurs 75:905–917
Jones TL, Yoder LH, Baernholdt M (2019b) Variation in academic preparation and progression of nurses across the continuum of care. Nurs Ourlook 67:381–392
Jones T, Drach-Zahavy A, Amorim-Lopes M, Wilis E (in press) Systems, economics and neoliberal politics: theories to understand missed nursing care. Nurs Health Sci
Kalisch BJ, Lee KH (2010) The impact of teamwork on missed nursing care. Nurs Outlook 58(5):233–241. https://doi.org/10.1016/j.outlook.2010.06.004
Kalisch BJ, Williams RA (2009) Development and psychometric testing of a tool to measure missed nursing care. J Nurs Adm 39(5):211–219
Kalisch BJ, Tschannen D, Lee KH (2011) Do staffing levels predict missed nursing care? Int J Qual Health Care 23(3):302–308
Kalisch BJ, Gosselin K, Choi SH (2012) A comparison of patient care units with high versus low levels of missed nursing care. Health Care Manag Rev 37(4):320–328. https://doi.org/10.1097/HMR.0b013e318249727e
Kallen MA, Yang D, Haas N (2012) A technical solution to improving palliative and hospice care. Support Care Cancer 20:167–174
Kelly L, Vincent D (2010) The dimensions of nursing surveillance: a concept analysis. J Adv Nurs 67(3):652–661
Kuntz G, Tozer JM, Snegosky J, Fox J, Neuman K (2014) Michigan oncology medical home demonstration project: first-year results. J Oncol Pract 10(5):294–297
Kutney-Lee A, Lake ET, Aiken LH (2009) Development of the hospital nurse surveillance capacity profile. Res Nurs Health 32:217–228
Li D, Elliott T, Klein G, Ur E, Tang TS (2017) Diabetes nurse case management in a Canadian tertiary care setting: results of a randomized controlled trial. Can J Diabetes 41:297–304
McCloskey JC, Bulechek GM (1992) Nursing interventions classification (NIC), 2nd edn. Mosby Year Book, St Louis, MO
McCloskey JC, Bulechek GM (2000) Nursing interventions classification (NIC), 3rd edn. Mosby Year Book, St Louis, MO
Medical Research Council (2006) Developing and evaluating complex interventions: new guidance. www.mrc.ac.uk/complexinterventionsguidance
Mitchell PH, Fertich S, Jennings BM (1998) Quality health outcomes model. Image J Nurs Sch 30(1):43–46
Mitchell MD, Trotta RL, Lavenberg JG, Umscheid CA (2014) Hourly rounding to improve nursing responsiveness. A systematic review. J Nurs Adm 44(9):462–472

Mkanta WN, Chumbler NR, Richardson LC, Kobb RF (2007) Age-related differences in quality of life in cancer patients. A pilot study of a cancer care coordination/home-telehealth program. Cancer Nurs 30(6):434–440

Mushta J, Rush KL, Andersen E (2018) Failure to rescue as a nurse-sensitive indicator. Nurs Forum 53:84–92

National Quality Forum (2004) National voluntary consensus standards for nursing-sensitive care: an initial performance measure set. A consensus report. Author, Washington, DC. https://www.qualityforum.org/Publications/2004/10/National_Voluntary_Consensus_Standards_for_Nursing-Sensitive_Care__An_Initial_Performance_Measure_Set.aspx

Needleman J, Buerhaus PI (2007) Failure to rescue: comparing definitions to measure quality of care. Med Care 45(10):913–915

O'Malley AS, Draper K, Gourevitch R, Cross DA, Scholle SH (2015) Electronic health records and support for primary care teamwork. J Am Informat Assoc 22:426–434

Pfrimmer DM, Johnson MR, Guthmiller ML, Lehman JL, Rhudy LM (2017) Surveillance: a nursing intervention for improving patient safety in critical care environment. Dimens Crit Care Nurs 36(1):45–52

Richard AA, Shea K (2011) Delineation of self-care and associated concepts. J Nurs Scholarsh 43(3):225–264

Sahota O, Drummond A, Kendrick D, Grainge MJ, Vass C, Sach T, Gladman J, Avis M (2014) REFINE (REducing Falls in In-patieNt Elderly) using bed and bedside chair pressure sensors linked to radio-pagers in acute hospital care: a randomised controlled trial. Age Aging 43:247–253

Santana M, Feeny D (2014) Framework to assess the effects of using patient-reported outcome measures in chronic care management. Qual Life Res 23:1505–1513

Schmidt LE (2010) Making sure: registered nurses watching over their patients. Nurs Res 59(6):400–405

Schoneman D (2002) The intervention of surveillance across classification systems. Int J Nurs Terminol Classif 13(4):137–147

Schubert M, Glass TR, Clarke SP, Schaffert-Witvliet B, De Geest S (2007) Validation of the Basel extent of rationing of nursing care instrument. Nurs Res 56(6):416–424

Schubert M, Ausserhofer D, Desmedt M, Schwendimann R, Lesaffre E, Li B, De Geest S (2013) Levels and correlates of implicit rationing of nursing care in Swiss acute care hospitals—A cross-sectional study. Int J Nurs Stud 50:230–239. https://doi.org/10.1016/j.ijnurstu.2012.09.016

Serpa S, Ferreira CM (2019) Micro, meso, and macro levels of social analysis. Int J Soc Stud 7:3. https://doi.org/10.11114/ijsss.v7i3.4223

Shever LL (2011) The impact of surveillance on failure to rescue. Res Theory Nurs Pract Int J 25(2):107–126

Sidani S (2011) Symptom management. In: Doran DM (ed) Nursing outcomes the state of the science, 2nd edn. Jones & Bartlett Learning, Ontario, Canada

Sims S, leamy M, Davies N, Schnitzler K, Levenson R, Mayer F, Grant R, Brearly S, Gourlay S, Ross F, Harris R (2018) Realist synthesis of intentional rounding in hospital wards: exploring the evidence of what works, for whom, in what circumstances and why. BMJ Qual Saf 27:743–757

Snyder M (1992) Independent nursing interventions, 2nd edn. Delmar, Albany, NY

Snyder M, Egan EC, Nojima Y (1996) Defining nursing interventions. Image J Nurs Sch 28(2):137–141

Stone R (2005) Structuration theory. Palgrave-MacMillan, London, UK

Stover AM, Stricker CT, Hammelef K, Hensen S, Carr P, Jansen J, Deal AM, Bennett AV, Basch EM (2019) Using stakeholder engagement to overcome barriers to implementing patient-reported outcomes (PROs) in cancer care delivery. Med Care 57:S92–S99

Titler MG (1992) Interventions related to surveillance. Nurs Clin N Am 27(2):495–502

Votruba L, Graham B, Wisinski J, Syed A (2016) Video monitoring to reduce falls and patient companion costs for adult inpatients. Nurs Econ 34(4):185–189

Whitmer K, Preumer J, Wilhelm C, McCraig L, Hester JDB (2011) Development of an outpatient oncology symptom management clinic. Clin J Oncol Nurs 15(2):175–179

Yang LY, Manhas DS, Howard AF, Olson RA (2018) Patient-reported outcome use in oncology: a systematic review of the impact on patient-clinician communication. Support Care Cancer 26:41–60