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Decision-Making in Nursing Practice: An Integrative Literature Review

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Abstract

Aims and Objectives—Identify and summarize factors and processes related to registered nurses' patient care decision-making in medical-surgical environments. A secondary goal of this literature review was to determine whether medical-surgical decision-making literature included factors that appeared to be similar to concepts and factors in Naturalistic Decision Making.

Background—Decision-making in acute care nursing requires an evaluation of many complex factors. While decision-making research in acute care nursing is prevalent, errors in decision-making continue leading to poor patient outcomes. Naturalistic Decision Making may provide a framework for further exploring decision-making in acute care nursing practice. A better understanding of the literature is needed to guide future research to more effectively support acute care nurse decision-making.

Design—Pubmed and CINAHL databases were searched and research meeting criteria was included. Data were identified from all included articles and themes were developed based on these data.

Results—Key findings in this review include nursing experience and associated factors; organization and unit culture influences on decision-making; education; understanding patient status; situation awareness; and autonomy.

Conclusions—Acute care nurses employ a variety of decision-making factors and processes. Informally identify experienced nurses to be important resources for decision-making. Incorporation of evidence into acute care nursing practice continues to be a struggle for acute care nurses. This review indicates that Naturalistic Decision Making may be applicable to decision-making nursing research.

Keywords

Acute Care; Clinical Decision-Making; Naturalistic Decision Making; Decision-Making; Education; Evidence-Based Practice; Literature Review; Nursing Research; Nursing Practice

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Conflicts of Interest

The authors declare that they have no conflicts of interests associated with this article.

Introduction

The Institute of Medicine has identified that up to 98,000 patients die each year as a result of poor decision-making in healthcare (Kohn, 1999). Decision-making is essential to nursing practice (Lauri & Salantera, 1998). Decision-making in acute care nursing practice is a complex process. Nurses must consider numerous, potentially competing factors when making decisions to meet patient and family needs (Tanner, 2006). This process is further complicated by the fact that nurses may care for five or more patients in an acute care environment (Tanner, 2006). Research identifies other factors associated with decision-making challenges for acute care nurses. For instance, critical care nurses can make decisions every 30 seconds (Bucknall, 2000). Nurse decision-making in acute care is highly demanding. Improved understanding of decision-making research in this environment may help to guide future efforts to support nursing practice.

Research on decision-making has emerged from a variety of fields including economics, nursing, and medicine (Johansen & O'Brien, 2015). Nursing research further explored elements important to nurse decision-making that include experience and intuition, context of the decision-making situation, knowing the patient, interpretation, and reflection (Johansen & O'Brien, 2015; Tanner, 2006). The complexity of decision-making for nurses continues to increase with increases in patient acuity and technological advances (Simmons, Lanuza, Fonteyn, Hicks, & Holm, 2003). In addition, nurse decision-making can vary significantly based on nurse practice setting (Tummers, van Merode, & Landeweerd, 2002). An understanding of nurse decision-making in the medical-surgical environment is essential for enhancing patient outcomes. A review of the literature was conducted with the goal of summarizing the factors and processes identified in research on nurse patient care decisions in the medical-surgical setting.

Background

Decision-making research has emerged from various fields. Nursing science has built on this early research in decision-making to facilitate understanding and inform nursing education and practice to enhance patient care. A background in the evolution of decision-making research provides an understanding of factors important to decision-making and can inform future nursing research, practice and education.

Early decision-making research

Early decision-making research in economics included a consideration of the influence of motivating forces (Johansen & O'Brien, 2015; Simon, 1959). The decision-making process ends with fulfillment of the motivating force (Simon, 1959). In this research, fulfillment of the motivating force was referred to as satisficing to indicate that a satisfactory rather than ideal result is acceptable (Simon, 1959). This early work also describes the importance of perception as an influence on decision-making (Simon, 1959). The decision-maker's perception is described as influenced by their environments, goals, and values (Simon, 1959). The combination of satisficing and perception emphasizes the importance of human elements to the decision-making process.

Early medical decision-making theories focused on the approaches of coherence and correspondence (Hammond, 1996). Coherence explored the rationale behind a decision using a mathematical approach based on logic (Hammond, 1996). Using coherence, the decision-making process, rather than the end result, was evaluated (Hammond, 1996). Traditionally, physician decision-making was evaluated using coherence (Hammond, 1996). With correspondence, the accuracy of a decision was emphasized without regard for the rationale behind the decision and the experience level of the decision-maker was important to this process (Hammond, 1996). Coherence and correspondence were viewed as complimentary (Hammond, 1996). For the decision-making process, correspondence represents an inference stage and coherence provided the justification stage (Hammond, 1996). The work on correspondence and coherence stages of decision-making reflects the importance of both inference and justification to decision-making providing a more complete representation of the decision-making process.

Other medical decision-making research explored the influence of experience. In describing the education of medical students it was observed that while students are taught a systematic approach to decision-making, experienced decision-makers appeared to make decisions without obviously following a formal decision-making procedure (Hamm, 1988). This informal decision-making procedure was intuition (Hamm, 1988). Intuition was described as going beyond merely a lack of analysis and included the experienced decision-makers' depth of knowledge facilitating an ability to predict circumstances effectively (Hamm, 1988). The combination of intuitive and analytic approaches allow medical decision-makers, with varying level of experience, to make decisions in a variety of situations with differing contextual features (Hamm, 1988).

Nursing decision-making research

Early decision-making research focusing on nurses identified that when presented with uncertainty, nurses demonstrated cautiousness in their interpretation of patient status (Hammond, Kelly, Schneider, & Vancini, 1967). Building on previous decision-making literature, nurse decision-making research in the clinical environment includes data collection, interpretation of collected data, planning associated with nursing intervention implementation, and evaluation of the results (Bucknall, 2003). Clinical judgment or decision-making, includes conclusions about a patient's status and needs with a determination of a method to implement to best meet patient needs including an assessment of the patient response (Tanner, 2006). Analytic and intuitive processes have been described in nursing literature. Analytic nurse decision-making requires the decision-maker to combine patient cues to form a logical determination of intervention to address patient need (Corcoran-Perry & Bungert, 1992). Intuitive nurse decision-making is based on experience and includes recognition of similarities between patient care situations, awareness developed over time, and a process that may appear to be without rationale (Benner & Tanner, 1987; Corcoran-Perry & Bungert, 1992). Expert nurses use intuition in their decision-making (Benner & Tanner, 1987). Pattern recognition facilitates expert identification of clinical situations allowing for confidence in the decision-making process (Benner, Tanner, & Chesla, 1992). Literature review indicates that nurses find intuition valuable to their nursing practice and that it should be combined with evidence for best patient care (Rew & Barrow,

2007). However, use of intuition varies among nurses. Nurses with more experience prefer using intuition in their practice (Pretz & Folse, 2011). Intuition provided a confidence in nursing skills, employs new nursing practice methods, as well as a feeling of connection with patients (Pretz & Folse, 2011). In contrast, inexperienced nurses employ an analytic approach when decision-making (Price, Zulkosky, White, & Pretz, 2017). Research indicates that experienced nurses make better decisions, especially with more complicated patient care decisions, than inexperienced nurses (Corcoran, 1986). The benefits of experience in decision-making are clear. Improved understanding of how experienced nurse decision-making occurs is warranted in an effort to better support decision-making for all levels of experience.

Conceptual frameworks in decision-making research

Philosophically, nursing research has historically focused on analytic classical decision-making processes (Cioffi, 2012). Classical decision-making includes a rational approach through a formal selection of an ideal option following an evaluation of a complete list of options (Lipshitz, Klein, Orasanu, & Salas, 2001). Further research found that experienced decision-makers do not use this classical approach to decision-making in real-world decision-making circumstances (Klein, Calderwood, & Clinton-Cirocco, 2010). Instead, experienced decision makers pattern match based on previous experience and intervene without conscious awareness of having made a decision (Klein et al., 2010). This led to the development of Naturalistic Decision Making (NDM) (Klein et al., 2010).

In addition to the important influence of experience in decision-making, this framework emphasizes contextual key factors during decision-making (Klein et al., 2010). The key factors include the influences of uncontrolled, changeable, time limited, high pressure environments (Klein et al., 2010). The environment often includes a team and an overall culture which influences decision-making (Klein et al., 2010). NDM has been found helpful in understanding decision-making in many professions that require time limited, high stakes decision-making (Carvalho, dos Santos, & Vidal, 2005; Randel, Pugh, & Reed, 1996). However, use of NDM as a conceptual guide for acute care nursing research is limited. Due to the similarity in factors found in nursing literature and in NDM, such as experience and pattern matching, NDM may provide an important framework to improve understanding of acute care nurse decision-making.

This paper will focus on nursing decision-making required for the care of acutely ill patients. NDM, as a conceptual framework will guide further understanding of nursing decision-making in acute care to provide new information for nursing practice, education, and future research.

Aim

The aim of this integrative review is to identify and summarize factors and processes related to registered nurses' patient care decision-making in medical-surgical environments. A secondary goal of this literature review was to determine whether medical-surgical decision-making literature reveals factors that are similar to concepts and factors in NDM. The literature search was designed with the help of a librarian to be a broad search of nursing

literature on decision-making to facilitate understanding of factors and processes and to identify gaps in research that could be addressed through future research and to explore whether NDM may provide a new focus for enhanced understanding of acute care nurse decision-making. Objectives developed to meet this aim included (1) identification of studies and reviews focusing on real-world acute care nursing practice and decision-making (2) critique of quality of studies and (3) identification of well-supported themes found within the included research to provide new information related to decision-making in nursing practice.

Method

A mixed studies literature review was conducted to include various research methodologies (Whittemore, Chao, Jang, Minges, & Park, 2014). The literature included in this review met clear and specific criteria associated with inclusion and exclusion of articles to represent the data in an unbiased manner (See Search Outcome) (Whittemore & Knafl, 2005). Databases were searched using terms determined to gather data relevant to the aim of the review (See Search Strategy) (Whittemore & Knafl, 2005). Thematic analysis was used to synthesize and summarize factors and processes that emerged from the literature as important in nursing decision-making (Whittemore & Knafl, 2005). The exploration of the data included reading and re-reading of all the included articles to identify themes and to facilitate consistency in findings and verify information identified in thematic analysis to prevent exclusion of important information within the data (Whittemore & Knafl, 2005). Through use of this method, this review provides new information for nursing science represented by the data found in the research articles and systematic reviews included in this review.

Search Strategy

The authors determined the central terms based on the review's aim for this systematic search. Because this review sought to understand decision-making in medical-surgical nursing and to determine if this body of research identifies factors found within NDM, the search terms were broad to capture a wide variety of data relevant to the review's aims. A librarian then assisted in the search of the included databases. The Pubmed database was searched using the terms: "Decision Making", "Nurses", and "Process". Cumulative Index to Nursing and Allied Health (CINAHL) database was searched using the terms: "Decision Making, Clinical" and "Nursing Practice". The search was designed to broadly explore research on nurse decision-making in medical surgical settings. Publications in this search were not excluded due to publication date and the search took place in 2017. This search identified 189 articles published from 1986 to 2015.

Search Outcome

Per PRISMA guidelines, two articles were removed due to duplication (Moher, 2009). (See Table 1 for PRISMA flow-diagram). Initial screening, used inclusion and exclusion criteria, based on title and abstract and led to exclusion of 163 articles. Inclusion criteria for this review were: nursing research (including systematic reviews), registered nurse decision-making related to patient care in medical surgical environments, and articles published in

English. Exclusion criteria included simulation and education research settings to provide a focus on factors important to real-world decision-making in NDM. Research with advanced practice or student participants, tool development, and dissertations were also excluded. Quality appraisal (See Quality Appraisal) led to exclusion of 9 articles. This review included a total of 17 articles published between 1998–2015.

Quality Appraisal

Research included in this review was evaluated using appraisal tools specifically designed for the research method of each article. No specific standard for quality appraisal of research exists (Whittemore & Knafl, 2005). Appraisal tools (described below) were selected based on their ability to evaluate internal validity or trustworthiness within each research approach. Each article received a calculated score based on the appraisal tool. This score determined inclusion or exclusion of an article based on appraisal. Nine articles were excluded based on quality appraisal.

Quantitative literature was evaluated using a quantitative appraisal tool adapted for use for this review (Davids & Roman, 2014). This tool was found to be useful in appraising a wide range of quantitative research (Davids & Roman, 2014). This tool included 6 questions and focused on sampling methods, response rates, measurement tool validity and reliability, data sources, and an inclusion of decision-making and nursing practice as variables examined in the quantitative research. A score of 34% or greater was considered satisfactory and led to inclusion in the study (Davids & Roman, 2014). Included quantitative articles scored on a range between 40% to 66% on the quantitative appraisal tool.

Qualitative research and systematic appraisals were completed using tools from the Joanna Briggs Institute (Joanna Briggs Institute, 2017a, 2017b). These tools required “yes”, “no”, or “unclear” responses to appraisal questions. A “yes” response led to a score of 1 per question. “No” or “unclear” responses led to a score of zero. Total scores of 40% or more led to acceptance of research using both Joanna Briggs tools. The qualitative appraisal tool included 10 questions (Joanna Briggs Institute, 2017a). Examples of these questions include looking for congruity between research method and research question, looking for congruity between research method and interpretation of results, representation of participant voice, and flow of conclusions from analysis of data (Joanna Briggs Institute, 2017a). Included qualitative studies scored between 70% and 100% on qualitative appraisal tool.

The systematic review appraisal tool included eleven questions (Joanna Briggs Institute, 2017b). Examples of questions from the systematic review tool include appropriateness of inclusion criteria, search strategy, appraisal of included studies, and methods to combine studies (Joanna Briggs Institute, 2017b). Included systematic review articles scored between 70% and 100% on the systemic review appraisal tool.

Data Abstraction and Synthesis

Matrices were developed at various stages of this review to enhance organization, support data analysis, and develop themes (Whittemore & Knafl, 2005). Initially, the articles were divided based on the database in which they were found. Matrices at this stage provided

information on samples, settings, methods, and results. These matrices were designed to summarize the included literature for comparison of specific factors such as settings, samples, and methods (Whittemore & Knafl, 2005). The second stage included matrices that included the primary sources organized based on similarities and patterns within the data (Whittemore & Knafl, 2005). The second matrix was the initial stage of theme development (Whittemore & Knafl, 2005). A final matrix identified themes that emerged from the articles overall including specific information within the research articles to provide context for the themes and to facilitate the development of findings for this review. This final table allowed for identification of similarities and supported theme development between authors (Whittemore & Knafl, 2005). The last step was synthesis of the themes found in the included literature into a new representation of the data (Whittemore & Knafl, 2005).

Results

Samples, settings, and methods

The number of participants in the included studies ranged from 12 to 150. Research in this review included 9 qualitative studies, 3 quantitative studies, and 5 systematic literature reviews (Tables 2, 3 and 4 provide specific information on methods and other details of the included studies). The countries associated with the articles in this review were United States (5), United Kingdom (5), Australia (3), Canada (1), Sweden (1), New Zealand (1), Greece (1), and Wales (1).

Key findings

Themes identified in this review include: nursing experience and associated factors; organization and unit culture influences on decision-making; education; understanding patient status; situation awareness; and autonomy. Specific information on each included article is found in Tables 2, 3 and 4. Experience was the most commonly identified theme and includes four subthemes.

Nurse experience and associated factors—Experience relates to time spent in clinical practice. Nurses' clinical judgments were found to be influenced more by previous experiences than by the actual clinical situation in which decisions are made (Cappelletti, Engel, & Prentice, 2014). Experience for nurses in one study was based on both professional practice as well as personal experience as a registered nurse indicating that two components of nursing experience exist related to clinical practice (Oliver & Butler, 2004). Experience was associated with confidence, intuition and other influences on decision-making, use of protocols, and colleague collaboration.

Experience and confidence: Time spent as a nurse led to positive influences on nurse decision-making. For instance, experience increased self-confidence (Radwin, 1998). This confidence promoted nurses' belief in their ability to ask questions, consider options for patient care, implement interventions and trust their competence in nursing practice (Oliver & Butler, 2004; Radwin, 1998). The increase in self-confidence was associated with communication skills, supported decision-making, and facilitated determination of interventions and management of emergencies (Radwin, 1998). Increases in self-confidence

also supported nurse ability to manage daily requirements of their role and identify interventions focused on individual patients when decision-making (Oliver & Butler, 2004; Radwin, 1998). However, confidence was not a consistently positive factor in decision-making. One systematic review of 15 studies found that the number of years in clinical practice was not associated with effective clinical decision-making (Cappelletti et al., 2014). In fact, experience alone was a weak indicator of best clinical decision-making when identifying interventions, activating of team support, or improving situation awareness (Pantazopoulos et al., 2012; Stubbings, Chaboyer, & McMurray, 2012). While nurses with experience feel more confident in their practice, this confidence may not lead to improved decision-making. How experience best benefits decision-making in acute care nursing remains unclear in nursing literature.

Intuition and other decision-making processes: Decision-making processes used by medical-surgical nurses identified in research include factors associated with unconscious awareness such as intuition and related processes. Intuition, used by expert nurses, was described as possibly subject to decision-maker biases leading to error due to the influence of experience based preconceptions (Cappelletti et al., 2014). Experience guided decision-making in many ways. Instinct, employed by experienced decision-makers, also does not include conscious rationale and was similarly associated with feelings about a patient's status rather than a decision based on specific patient findings (Rycroft-Malone, Fontenla, Seers, & Bick, 2009). Interestingly, one study found analytic decision-makers, using rationale as a basis for decision-making, were more experienced, had worked longer on their unit, and were older (Parker, 2014). This contrasts with earlier research on intuition indicating that experience is linked with use of intuition in nursing practice (Benner & Tanner, 1987). The value of experience as an unconscious guide for decision-making remains unclear in the medical-surgical setting.

Nurses identified patient situations as patterns or as similar based on previous experience to facilitate decision-making (Cappelletti et al., 2014; Lake, Moss, & Duke, 2009; Rycroft-Malone et al., 2009; Tower, Chaboyer, Green, Dyer, & Wallis, 2012). Recognition of patterns was described as a conscious use of intuition (Cappelletti et al., 2014). Pattern matching from previous experiences influences nursing practice. For instance, patterns facilitated identification of important features within a patient care situation (Lake et al., 2009). Identification of patterns provides a guide for nurse decision-making. Nurses also used pattern matching to identify differences in patient care situations for decision-making guidance. When patients did not progress as expected during hospitalization, nurse assessment became more involved (Tower et al., 2012). Patients who progressed as anticipated led nurses to explore more broadly and include patient support needs (Tower et al., 2012). Therefore, patient circumstances that do not fit with previous experience motivates nurses to expand their patient assessment to facilitate decision-making.

Experience and use of nursing protocols: Experience also influenced the integration of standard protocols in nursing practice. Use of protocols became second nature with practice for experienced nurses but were useful for unusual situations, for inexperienced nurses, as support for decision-making, to enhance confidence in decisions, and for patient safety

(Dougherty, Sque, & Crouch, 2012; Rycroft-Malone et al., 2009). However, nurses believed protocols in general were not patient specific and therefore not ideal for patient care (Rycroft-Malone et al., 2009). In fact, nurses may choose to favor their own knowledge over information from a protocol to guide their decision-making (Dougherty et al., 2012; Samuriwo & Dowding, 2014). The selective use of protocols indicates nurses, at times, feel more confident in their ability to make patient specific decisions rather than simply following a protocol. The preference for decisions based on experience rather than evidence indicates that there is a gap in understanding in how best to support nurse decision-making with evidence.

Colleague collaboration in decision-making: Collaboration with experienced colleagues influenced nurse decision-making in acute care settings. Experienced nurse colleagues provided advice and confirmation of thinking to other acute care nurses (Cappelletti et al., 2014; Rycroft-Malone et al., 2009). The value of experience in nurse decision-making is high. In fact, nurses indicated a preference for information provided by experienced colleagues or their own experience more than other sources of information (Cappelletti et al., 2014; Rycroft-Malone et al., 2009; Samuriwo & Dowding, 2014; Seright, 2011). Information from colleagues was described as more applicable in patient care situations than protocols (Seright, 2011). Nurses also found protocols difficult to reference during time constrained situations (Rycroft-Malone et al., 2009). In addition to valuing the advice of experienced colleagues, nurses may find access to colleagues more efficient and patient specific in time constrained critical decision-making circumstances.

Nurses described decision-making as a social experience (Rycroft-Malone et al., 2009). Nurses found that the social aspect of asking colleagues for advice was supportive and important in the decision-making process (Rycroft-Malone et al., 2009; Seright, 2011). In fact, nurses described preferring the social sources for decision-making support within nursing practice over evidence (Seright, 2011). When identifying whom to ask for advice, nurses assessed colleagues for their ability to provide effective information to support nursing practice (Seright, 2011). The process nurses used to determine who would provide quality information for patient care was not clear. Efficiency, an informal identification of a colleague for advice plus the rewarding social features discussing patient care with a colleague may be part of the appeal of advice from colleagues rather than use of a protocol to guide nursing practice.

Organization and unit culture influences on decision-making—Organizational factors and unit culture influence decision-making in acute care nursing clinical environments (Braaten, 2015; Cappelletti et al., 2014; Stubbings et al., 2012). Often, informal rules guide decision-making. These informal rules can influence nurse activation of rapid response teams and influence the sharing of information within a unit (Braaten, 2015; Cappelletti et al., 2014). Nurses describe concerns related to how they will be perceived by others when determining whether to activate a rapid response team (Braaten, 2015). Working within a team includes nonspecific challenges in nursing practice. Other factors important to decision-making may be associated with organizational culture. For instance, nurses' situation awareness was influenced by leadership, and individual personalities (Stubbings et

al., 2012). Organizational decision-making factors within a nursing unit provide informal influence over nurse decision-making that could influence patient care.

Education—Education in this review refers to formal programs including registered nurse programs and post-graduation programs designed to enhance nursing practice in clinical units. Education focusing on the improvement of clinical nursing practice and enhancement of decision-making in clinical settings did not lead to improved clinical decisions (Doherty-King & Bowers, 2013; Thompson & Stapley, 2011). However, other research did find that education positively influenced decision-making. Nurses from four year programs called for medical emergency teams when needed more often than nurses from two year programs (Pantazopoulos et al., 2012). Education also improved situation awareness in professional environments and is thought to be helpful in patient management (Stubbings et al., 2012). The influence of education on effective clinical decision-making is unclear. Education alone may not be the ideal measure for effective decision-making in clinical practice.

Understanding patient status—Understanding patient status is linked with knowledge, developed over a period of time, and facilitates decision-making (Cappelletti et al., 2014). To better understand a patient's status the nurse must invest time through physical presence with the patient to support decision-making (Braaten, 2015). The decision-making process for nurses included the spending time with the patient to support higher level more holistic decisions based on a deeper understanding of individual patient responses (Cappelletti et al., 2014). In addition to supporting decision-making, understanding the patient can improve patient participation in decision-making (Cappelletti et al., 2014). In the time limited environment of acute care, time invested in developing deep understanding of a patient's status indicates that prioritizing time spent with patients is highly valued to support decision-making. The perception of understanding a patient can be demonstrated in other ways also. For instance, nurses may believe that knowing the patient allows them to ignore patient identification protocols for medication administration (Dougherty et al., 2012). Understanding patient status requires time, provides a basis for nurse decision-making but, in some circumstances, may lead to a deviation from safety oriented patient identification protocols.

Understanding of patient status included collection of physiologic cues and was influenced by technology used in nursing practice. Authors describe the patient information collected to inform their decisions as cues (Tower et al., 2012). Nurses used patient information and physiologic cues in various ways to develop a mental model of the patient situation that helped inform their decision-making (Tower et al., 2012). Physiologic cues that nurses found of primary concern in patient care include heart rate, thoracic pain, airway obstruction, and respiratory rate (Pantazopoulos et al., 2012). Following collection of information, various factors influence nurses' responses when making decisions. For instance, gradual changes versus abrupt changes in patient condition led nurses to respond differently (Braaten, 2015). Patient information that indicates a gradual change required nurses to gather additional information including discussion with experienced colleagues before decision-making (Braaten, 2015). An abrupt change led nurses to make decisions more quickly (Braaten,

2015). Nurse decision-making is responsive to various levels of patient cues not limited to physiological cues alone but also complex factors such as progression of change.

Understanding patient status is an important and complex part of decision-making for nurses. To understand patient status, the nurse must invest time, collect physiologic cues, determine which cues are important, often interact with technology, and determine how to respond to the collected information as part of their decision-making process.

Situation Awareness—Clinical nursing decision-making research includes situation awareness. Situation awareness is developed through an understanding of the present state of a situation which informs the decision-making process (Endsley, 1997). Types of patient information nurses used to help develop situation awareness included patient diagnoses, understanding of the importance of the information collected and prediction of potential patient outcomes to facilitate planning of care (Tower et al., 2012). Individual nursing factors such as self-confidence and assertiveness influenced situation awareness (Stubbings et al., 2012). Factors, including memory and automatic responses, developed through experience and earlier thought to be supportive of situation awareness, were found to not be influential (Stubbings et al., 2012). Shared understanding of a patient's situation awareness led to improved work environments and a reduction in error (Stubbings et al., 2012). Situation awareness was found to be important at different stages of a patient's admission in the hospital (Tower et al., 2012). Situation awareness was developed through identification of a patient's medical diagnosis and relevant symptoms, an understanding of the importance of patient symptoms, and a perception of how a patient will progress during their hospital stay (Tower et al., 2012). Research on situation awareness in nursing practice includes identification of patient status through collection of patient information, an understanding of the importance of collected information, and the ability to understand future possibilities related to the patient circumstances. In addition, shared understanding between healthcare professionals can facilitate improved patient outcomes.

Autonomy—Autonomy in nursing practice influences decision-making (Cappelletti et al., 2014). In this review, autonomy is reflected through nursing behavior that reflects independence. Nurses who focused on increasing patient independence and psychosocial well-being believed themselves to be responsible for advancing patient ambulation (Doherty-King & Bowers, 2013). New graduate nurses were less inclined to independently initiate an ambulation program and more readily waited for other disciplines to begin an ambulation program (Doherty-King & Bowers, 2013). Thus, experience level could influence autonomy in nursing practice. In addition, the manner in which patients exhibit symptoms can influence autonomous decision-making. For instance, when assessed patient symptoms indicated a sudden change in patient status, especially without support from other healthcare professionals, nurses felt that the decision to call for a rapid response should be made immediately (Braaten, 2015). Decisions involving more gradual changes in patient condition led to nurses to seek the support of other healthcare professionals (Braaten, 2015). Autonomy in nursing practice supports important interventions such as patient ambulation thus is clearly important to the nurse decision-making process.

Synthesis of findings

Experience and decision-making—Experience represented the largest influence on decision-making in acute care nursing. Experience facilitated nurse development of self-confidence, use of unconscious rationale to guide decision-making, and provided the basis of collaboration with nurse colleagues in decision-making (Cappelletti et al., 2014; Dougherty et al., 2012; Radwin, 1998; Rycroft-Malone et al., 2009). Factors found to be important in this review to unconscious or intuitive decision-making are also previously identified in the literature. Similar to the findings in this review, unconscious decision-making processes involve more than just a nurse's feeling about a patient and can include factors such as identification of patterns (Melin-Johansson, Palmqvist, & Ronnberg, 2017). Decision support that facilitates identification of patterns to help less experienced nurses make decisions may be more similar to nurses with enough experience to see patterns among patients.

The influence of experience includes positive and negative factors for decision-making. For instance, while confidence improved communication and performance in nursing practice it was not linked with more effective decisions (Cappelletti et al., 2014). In addition, experienced nurses may decide to not use evidence based protocols to facilitate decision-making (Dougherty et al., 2012; Rycroft-Malone et al., 2009). This creates concern as evidence is essential for ideal patient outcomes in acute care (Yancy, 2013). Future research must explore how best to support nurses use of evidence when making decisions in their practice.

Influence of culture on decision-making—Cultural influences present within the nursing practice environment can influence decision-making through non-specific and patient centered means. Similar to the influence of experience, decision-making without evidence as a basis may lead to poor outcomes. A culture of safety is associated with nurses who feel supported through teamwork (Vifladt, Simonsen, Lydersen, & Farup, 2016). The focus on concern related to the perceptions of others when decision-making may reflect a non-safety oriented unit culture. A culture of safety in nursing may facilitate coping with serious patient situations for improved patient care (Vifladt et al., 2016).

Understanding patient status and situation awareness—Understanding patient status is time intensive and requires nurse presence, and includes the collection of patient cues (Braaten, 2015; Cappelletti et al., 2014; Tower et al., 2012). Nurses appeared to use their understanding of patient status to identify patient patterns (Tower et al., 2012). Situation awareness also led to nurse perceptions of how a patient will progress during their hospital admission (Tower et al., 2012). The predictive factors in decision-making have been linked to intuition in nursing literature (Melin-Johansson et al., 2017).

Naturalistic Decision Making in Nursing—This review included factors found important to decision-making described in the NDM framework. Most clearly, this review identifies experience as most influential to decision-making in nursing practice. Experience is a central focus of NDM (Klein et al., 2010). Experienced decision-makers are identified in NDM research as following a unique process when making decisions in critical time limited

circumstances (Klein et al., 2010). Also similar to this review, NDM includes the important influence of team members during decision-making (Klein et al., 2010). Finally, NDM describes a pattern matching process that guides decision-making by experienced decision-makers (Klein et al., 2010). Nurses were described in this review as developing an understanding of patient status and situation awareness that led to pattern identification in patient care. NDM is a framework that may be applicable to nursing.

Strengths and limitations

This review provides new information on research on nurse decision-making in medical-surgical settings. Despite the broad focus of the search, this review had limitations. This review was limited to two databases, English language research, and non-nursing research. If the search had included more databases, additional languages, and disciplines other than nursing the review would have had a more comprehensive perspective. However, this review included a broad search without limitations on publication date for a wide variety of literature on decision-making in medical-surgical nursing environments. This provided new information for nursing science and allowed for an exploration of applicability of NDM as a conceptual framework for use in nursing research.

In addition, while autonomy influences decision-making in nursing, how autonomous nurses differ from non-autonomous nurses is not clear. In addition, how nurses developed the skills necessary for understanding patient status and situation awareness also are not clarified in the review. Differences in nurses with these characteristics and skills may contribute to their influence on decision-making.

Implications for practice, education, and research

Informally selected experienced nurses as decision support resources creates concerns. This review found that nurses identify colleagues as information resources based on personal perceptions of the colleague rather than by whether the colleague will provide evidence based guidance (Cappelletti et al., 2014; Seright, 2011). Nurses also believed that colleagues provided information that was more specific to patient care situations than evidence based sources and colleague advice was more readily accessible during time limited circumstances (Rycroft-Malone et al., 2009; Seright, 2011). The reliance on experienced nurses rather than evidence creates concerns related to the incorporation of bias in clinical decision-making. Enhanced support of nurses' use of evidence needs to be improved as this review identifies that nurses do not find it to be helpful to their decision-making. Implementation of evidence is essential for best patient care outcomes (Paul & Hice, 2014).

NDM focuses on the experienced decision maker and includes time limits as an important factor in decision-making indicating that this could be a useful guide for future research in this area (Klein et al., 2010). Overall, efforts to improve decisions in clinical nursing practice must facilitate the incorporation of evidence in nursing decision-making.

The influence of education on decision-making is unclear. More research on the influence of education on clinical decision-making is needed. Experience is an influential factor in

decision-making. Possibly more experiential learning, such as integration of simulation into education programs, would facilitate decision-making in acute care.

Understanding patient status is important to decision-making for acute care nurses. Nurses spend time with patients and identify patterns to support decision-making (Braaten, 2015; Tower et al., 2012). NDM, as it also includes how experienced decision makers use patterns, could be helpful as a guide for decision-making research exploring nurses' use of patterns in decision-making (Klein et al., 2010).

Conclusion

Ideal nurse decision-making is essential to enhanced patient care outcomes. This review identified numerous complex influences in the nurse decision-making process. Decision-making in clinical nursing requires a multifaceted approach to research, education, and practice to ensure best outcomes. Use of a conceptual framework, such as NDM, to guide understanding of acute care nurse decision-making may provide new information for nursing education, nursing and nursing science.

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References

- Benner P, Tanner C. Clinical judgment: how expert nurses use intuition. *American Journal of Nursing*. 1987; 87(1):23–31. [PubMed: 3642979]
- Benner P, Tanner C, Chesla C. From beginner to expert: gaining a differentiated clinical world in critical care nursing. *Advances in Nursing Science*. 1992; 14(3):13–28. [PubMed: 1550330]
- Braaten JS. Hospital System Barriers to Rapid Response Team Activation: A Cognitive Work Analysis. *American Journal of Nursing*. 2015; 115(2):22–33. DOI: 10.1097/01.NAJ.0000460673.82070.af
- Bucknall T. Critical care nurses' decision-making activities in the natural clinical setting. *Journal of Clinical Nursing*. 2000; 9(1):25–35. [PubMed: 11022489]
- Bucknall T. The clinical landscape of critical care: nurses' decision-making. *Journal of Advanced Nursing*. 2003; 43(3):310–319. [PubMed: 12859790]
- Cappelletti A, Engel JK, Prentice D. Systematic Review of Clinical Judgment and Reasoning in Nursing. *Journal of Nursing Education*. 2014; 53(8):453–458. DOI: 10.3928/01484834-20140724-01 [PubMed: 25050560]
- Carvalho PVR, dos Santos IL, Vidal MCR. Nuclear power plant shift supervisor's decision making during microincidents. *International Journal of Industrial Ergonomics*. 2005; 35(7):619–644. DOI: 10.1016/j.ergon.2005.01.010
- Cioffi J. Expanding the scope of decision-making research for nursing and midwifery practice. *International Journal of Nursing Studies*. 2012; 49(4):481–489. DOI: 10.1016/j.ijnurstu.2011.10.015 [PubMed: 22078210]
- Corcoran-Perry SA, Bungert B. Enhancing orthopaedic nurses' clinical decision making. *Orthopedic Nursing*. 1992; 11(3):64–70. [PubMed: 1625917]
- Corcoran SA. Task complexity and nursing expertise as factors in decision making... processes used by nurses to plan patient care. *Nursing Research*. 1986; 35(2):107–112. [PubMed: 3633505]

- Davids EL, Roman NV. A systematic review of the relationship between parenting styles and children's physical activity. *African Journal for Physical, Health Education, Recreation and Dance, Supplement*. 2014; 2(1):228–246.
- Doherty-King B, Bowers BJ. Attributing the responsibility for ambulating patients: A qualitative study. *International Journal of Nursing Studies*. 2013; 50(9):1240–1246. DOI: 10.1016/j.ijnurstu.2013.02.007 [PubMed: 23465958]
- Dougherty L, Sque M, Crouch R. Decision-making processes used by nurses during intravenous drug preparation and administration. *Journal of Advanced Nursing*. 2012; 68(6):1302–1311. DOI: 10.1111/j.1365-2648.2011.05838.x [PubMed: 21999334]
- Endsley, MR. The role of situation awareness in Naturalistic Decision Making. In: Zsombok, CE., Klein, G., editors. *Naturalistic Decision Making*. Mahwah, NJ: Lawrence Erlbaum Associates; 1997. p. 269-283.
- Hamm, RM. Clinical Intuition and Clinical Analysis: Expertise and Cognitive Continuum. In: Dowie, JEA., editor. *Professional Judgment: A Reader in Clinical Decision Making*. Cambridge: Cambridge University Press; 1988. p. 78-105.
- Hammond KR. How convergence of research paradigms can improve research on diagnostic judgment. *Medical Decision Making*. 1996; 16(3):281–287. [PubMed: 8818127]
- Hammond KR, Kelly KJ, Schneider RJ, Vancini M. Clinical inference in nursing: revising judgments. *Nursing Research*. 1967; 16(1):38–45. [PubMed: 5180790]
- Joanna Briggs Institute. Checklist for Qualitative Research. *Critical Appraisal Tools*. 2017a. Retrieved from http://joannabriggs.org/assets/docs/critical-appraisal-tools/JBI_Critical_Appraisal-Checklist_for_Qualitative_Research.pdf
- Joanna Briggs Institute. Checklist for Systematic Reviews and Research Syntheses. *Critical Appraisal Tools*. 2017b. Retrieved from http://joannabriggs.org/assets/docs/critical-appraisal-tools/JBI_Critical_Appraisal-Checklist_for_Systematic_Reviews.pdf
- Johansen ML, O'Brien JL. Decision Making in Nursing Practice: A Concept Analysis. *Nursing Forum*. 2015; doi: 10.1111/nuf.12119
- Klein G, Calderwood R, Clinton-Cirocco A. Rapid Decision Making on the Fire Ground: The Original Study Plus a Postscript. *Journal of Cognitive Engineering and Decision Making*. 2010; 4(3):186–209. DOI: 10.1518/155534310X1284400801203
- Kohn, LT., Corrigan, JM., Donaldson, MS. Errors in health care: A leading cause of death and injury. To err is human: Building a safer health system. 1999. p. 26-48. Retrieved from http://www.nap.edu/download.php?record_id=9728#
- Lake S, Moss C, Duke J. Nursing prioritization of the patient need for care: a tacit knowledge embedded in the clinical decision-making literature. *International Journal of Nursing Practice*. 2009; 15(5):376–388.
- Lauri S, Salanterä S. Decision-making models in different fields of nursing. *Research in Nursing and Health*. 1998; 21(5):443–452. [PubMed: 9761141]
- Lipshitz R, Klein G, Orasanu J, Salas E. Taking stock of naturalistic decision making. *Journal of Behavioral Decision Making*. 2001; 14(5):331–352. DOI: 10.1002/bdm.381
- Melin-Johansson C, Palmqvist R, Ronnberg L. Clinical intuition in the nursing process and decision-making-A mixed-studies review. *Journal of Clinical Nursing*. 2017; doi: 10.1111/jocn.13814
- Moher D, Liberati A, Tetzlaff J, Altman DG. the PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine*. 2009; 151(4):264–269. DOI: 10.7326/0003-4819-151-4-200908180-00135 [PubMed: 19622511]
- Oliver M, Butler J. Contextualising the trajectory of experience of expert, competent and novice nurses in making decisions and solving problems. *Collegian*. 2004; 11(1):21–27.
- Pantazopoulos I, Tsoni A, Kouskouni E, Papadimitriou L, Johnson EO, Xanthos T. Factors influencing nurses' decisions to activate medical emergency teams. *Journal of Clinical Nursing*. 2012; 21(17/18):2668–2678. DOI: 10.1111/j.1365-2702.2012.04080.x [PubMed: 22889450]
- Parker CG. Decision-making models used by medical-surgical nurses to activate rapid response teams. *Medsurg Nursing*. 2014; 23(3):159–164. [PubMed: 25137791]

- Paul S, Hice A. Role of the Acute Care Nurse in Managing Patients With Heart Failure Using Evidence-Based Care. *Critical Care Nursing Quarterly*. 2014; 37(4):357–376. DOI: 10.1097/CNQ.000000000000036 [PubMed: 25185764]
- Pretz JE, Folsie VN. Nursing experience and preference for intuition in decision making. *Journal of Clinical Nursing*. 2011; 20(19–20):2878–2889. DOI: 10.1111/j.1365-2702.2011.03705.x [PubMed: 21592247]
- Price A, Zulkosky K, White K, Pretz J. Accuracy of intuition in clinical decision-making among novice clinicians. *Journal of Advanced Nursing*. 2017; 73(5):1147–1157. DOI: 10.1111/jan.13202 [PubMed: 27862180]
- Radwin LE. Empirically generated attributes of experience in nursing. *Journal of Advanced Nursing*. 1998; 27(3):590–595. DOI: 10.1046/j.1365-2648.1998.00548.x [PubMed: 9543046]
- Randel JM, Pugh HL, Reed SK. Differences in expert and novice situations awareness in naturalistic decision making. *International Journal of Human-Computers Studies*. 1996; 45(5):579–597.
- Rew L, Barrow EM Jr. State of the science: intuition in nursing, a generation of studying the phenomenon. *Advances in Nursing Science*. 2007; 30(1):E15–25. [PubMed: 17299273]
- Rycroft-Malone J, Fontenla M, Seers K, Bick D. Protocol-based care: the standardisation of decision-making? *Journal of Clinical Nursing*. 2009; 18(10):1490–1500. [PubMed: 19413539]
- Samuriwo R, Dowding D. Nurses' pressure ulcer related judgements and decisions in clinical practice: A systematic review. *International Journal of Nursing Studies*. 2014; 51(12):1667–1685. doi:<http://dx.doi.org/10.1016/j.ijnurstu.2014.04.009>. [PubMed: 24835078]
- Seright TJ. Clinical decision-making of rural novice nurses. *Rural Remote Health*. 2011; 11(3):1726. [PubMed: 21787110]
- Simmons B, Lanuza D, Fonteyn M, Hicks F, Holm K. Clinical reasoning in experienced nurses...including commentary by Heims ML with author response. *Western Journal of Nursing Research*. 2003; 25(6):701–724. [PubMed: 14528618]
- Simon HA. Theories of Decision-Making in Economics and Behavioral Science. *The American Economic Review*. 1959; 49(3):253–283.
- Stubbings L, Chaboyer W, McMurray A. Nurses' use of situation awareness in decision-making: an integrative review. *Journal of Advanced Nursing*. 2012; 68(7):1443–1453. DOI: 10.1111/j.1365-2648.2012.05989.x [PubMed: 22429250]
- Tanner CA. Thinking like a nurse: a research-based model of clinical judgment in nursing. *Journal of Nursing Education*. 2006; 45(6):204–211. [PubMed: 16780008]
- Thompson C, Stapley S. Do educational interventions improve nurses' clinical decision making and judgement? A systematic review. *International Journal of Nursing Studies*. 2011; 48(7):881–893. doi:<http://dx.doi.org/10.1016/j.ijnurstu.2010.12.005>. [PubMed: 21241984]
- Tower M, Chaboyer W, Green Q, Dyer K, Wallis M. Registered nurses' decision-making regarding documentation in patients' progress notes. *Journal of Clinical Nursing*. 2012; 21(19–20):2917–2929. DOI: 10.1111/j.1365-2702.2012.04135.x [PubMed: 22784185]
- Tummers GER, van Merode GG, Landeweerd JA. The diversity of work: differences, similarities and relationships concerning characteristics of the organisation, the work and psychological work reactions in intensive care and non-intensive care nursing. *International Journal of Nursing Studies*. 2002; 39(8):841–855. [PubMed: 12379302]
- Vifladt A, Simonsen BO, Lydersen S, Farup PG. The association between patient safety culture and burnout and sense of coherence: A cross-sectional study in restructured and not restructured intensive care units. *Intensive and Critical Care Nursing*. 2016; 36:26–34. doi:<http://dx.doi.org/10.1016/j.iccn.2016.03.004>. [PubMed: 27212614]
- Whittemore R, Chao A, Jang M, Minges KE, Park C. Methods for knowledge synthesis: An overview. *Heart and Lung*. 2014; 43(5):453–461. DOI: 10.1016/j.hrtlng.2014.05.014 [PubMed: 25012634]
- Whittemore R, Knafl K. The integrative review: updated methodology. *Journal of Advanced Nursing*. 2005; 52(5):546–553. DOI: 10.1111/j.1365-2648.2005.03621.x [PubMed: 16268861]
- Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Drazner MH, ... Wilkoff BL. 2013 ACCF/AHA guideline for the management of heart failure: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. 2013

Relevance to Clinical Practice

Decision-making in nursing practice covers a broad range of factors and processes. Currently nursing research identifies nurse experience, culture of the nurse practice environment, education, nurse understanding of patient status, situation awareness, and autonomy as influential to decision-making. Experienced nurses bring a broad range of previous patient encounters to their practice influencing their intuitive, unconscious processes which facilitates decision-making. Using NDM as a conceptual framework to guide research may help with understanding how to better support less experienced nurses' decision-making for enhanced patient outcomes.

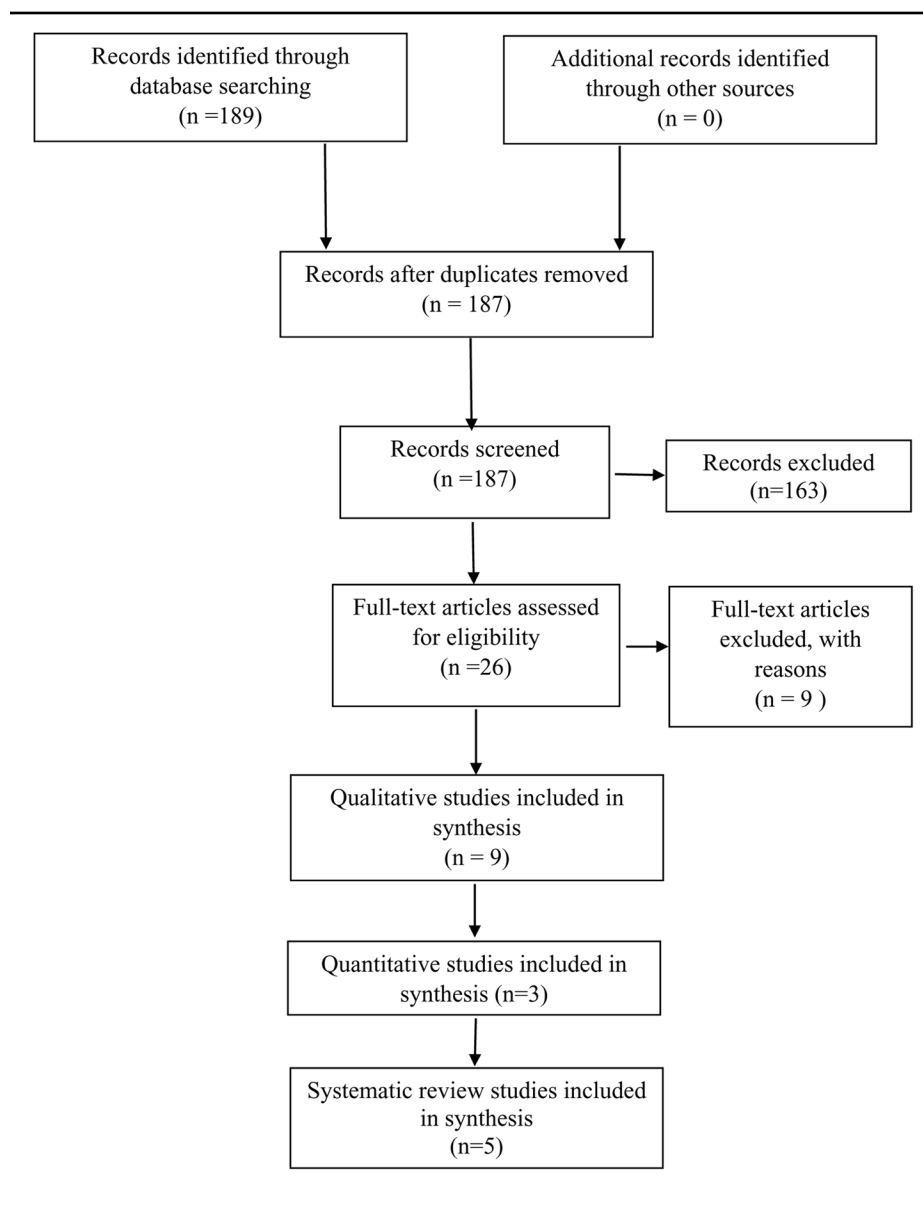
Summary Box

What does this paper contribute to the wider global clinical community?

- Current summary of literature on decision-making in acute care nursing.
- New information is provided for nursing science related to decision-making in acute care clinical nursing.
- Recommendation of a conceptual framework for use in understanding of decision-making in acute care nursing practice.

Table 1

PRISMA Flow Diagram



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Table 2

Quantitative Articles

Publication/Date/Authors	Aims/Purpose	Design/Methods	Context/Setting/Sample	Findings
Parker, C. G. (2014).	Nurses' decisions and RRT	Descriptive, cross-sectional, correlational quantitative Nurse Decision Making Instrument	87 acute care RNs, US	70% RNs used analytic/intuitive decision-making model, 21.8% used an analytic decision-making model, and 8% used an intuitive decision-making model
Pantazopoulos, Ioannis (2012)	Relationship between nurse demographics and correct identification of clinical situations	Descriptive, quantitative design. Questionnaire developed by authors based on European Resuscitation Council Guidelines	150 medical and surgical RNs, Greece	Categories with the greatest nursing concern were patients with heart rate < 40/minute, thoracic pain, foreign body airway obstruction and bronchial secretions, respiratory rate < 5/minute and heart rate = 100/minute.
Hoffman K, Donoghue J. & Duffield C. (2004).	Factors associated with clinical decision making	Correlational study Rhodes occupational orientation scale Rhodes questionnaire to measure decision-making	96 medical surgical RNs, Wales	Occupational orientation related to decision-making.

Table 3

Qualitative Articles

Publication/Date/Authors	Aims/Purpose	Design/methods	Context/Setting/Sample	Findings
Braaten, J. S. & Saucedo, J. (2015).	Describe factors nurses' RRT activation behavior	Qualitative descriptive design	12 medical—surgical nurses and document review, US	System factors affected participants' decisions to activate or not activate an RRT.
Doherty-King, B., & Bowers, B. J. (2013).	Relationship between nurses' responsibility for ambulating patients.	Descriptive qualitative secondary analysis of data	25 medical or surgical RNs, US.	Two groups of nurses: responsible for ambulation and not responsible.
Dougherty, L. (2012).	Decision-making processes and intravenous drug administration	Ethnographic study, observation and interviews.	UK; specialist cancer hospital; Twenty nurses	Themes: interruptions; identification and knowing the patient; routinized behavior, prevention of errors.
Tower, M. et al. (2012).	Nurses documentation decisions.	Naturalistic paradigm. Think-aloud methods	17 RNs, Australia	Models: newly admitted patient, patient whose condition was as expected and the discharging patient
Seright, T. J. (2011).	Nurse decisions and education, resources and culture.	Grounded theory, interviews.	12 novice nurses, US	Theme: "Sociocentric rationalizing" gathering information, conferring with co-workers, experience.
Rycroft-Malone J. et al. (2009).	Protocols and clinical decision-making.	Case study design using ethnography	Two sites UK	Person-to-person; decision-making was a social activity, not referred to regularly
Mantzoukas S & Jasper MA (2004)	Nurses ability to practice reflectively in organizations	Ethnography and qualitative content analysis	16 practicing medical nurses, England	Themes: relationships between nurses and doctors and nurses and managers; nursing practice; nurses' input.
Oliver, M. & Butler, J. (2004).	Reasoning and different levels of nurses	Ethnography	30 RNs in Australia	Experience important to development of clinical knowledge.
Radwin, L. E. (1998).	Nurses and "knowing the patient"	Exploratory descriptive study using grounded theory	54 RNs; US	Themes: focus on the patient, confidence in practice and knowledge of antecedents and consequences similar situations.

Table 4

Systematic Reviews

Publication/Date/Authors	Aims/Purpose	Design/methods	Context/Setting/Sample	Findings
Samuriwo, R., & Dowding, D. (2014).	Synthesize the literature decision making of nurses in pressure ulcers	A systematic search of published literature (ASSIA, CINAHL, Cochrane, Embase, Google Scholar, Medline, PubMed, PsycInfo, Science Direct).	from 1992 to present, UK	Sixteen studies and one systematic review Assessment tools were not routinely used to identify pressure ulcer risk.
Cappellletti, A., Engel, J. K., & Prentice, D. (2014).	Review literature on clinical judgment and reasoning in nursing.	Electronic databases were searched: PubMed, CINAHL, MEDLINE, and ERIC	Systematic review; (n=15), Canada	The findings of the systematic review generally support Tanner's original model.
Stubblings, L. (2012).	Review the literature related to situation awareness and clinical decision-making	Integrative review: PROQUEST, Web of Science, CINAHL, and PUBMED.	Five studies, Australia	Themes: individual factors influencing situation awareness, interpersonal behaviors influencing situation awareness and situation awareness improving working relationships and patient care
Thompson, C. & Stapley, S. (2011).	Systematic Review; educational interventions and clinical decisions	Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, CINAHL and PsycINFO, Social Sciences Citation Index, OpenSIGLE conference proceedings and hand searching nursing journal	24 studies, UK	The effectiveness and efficacy of interventions was mixed.
Lake, S. (2009).	Review clinical decision-making literature	Critical realism, (from 1966 to 2003). Thematic analysis	CINAHL: 461 items found including books, theses, New Zealand	Nursing prioritization