ABSTRACT
A systematic review was conducted to examine the findings on clinical judgment and reasoning in nursing that have emerged since Tanner’s review in 2006. Electronic databases were searched to locate primary research studies about clinical judgment and reasoning in nursing. Fifteen studies were extracted and analyzed using the five main conclusions outlined by Tanner. The findings of the systematic review generally support Tanner’s original model, although the role of experience in clinical reasoning and judgment is still not well understood or fully established. In recent literature, researchers have furthered their knowledge by using tools for improving these skills in both nursing students and practicing nurses, although no one strategy has been identified as being more effective. This is reflected in the consideration of a sixth conclusion on clinical judgment and reasoning in nursing—education strategies to improve clinical judgment may influence what a nurse brings to the situation. [J Nurs Educ. 2014;53(8):453-458.]

Clinical judgment and reasoning are essential elements of a nurse’s decision-making process and have long been considered to be the hallmarks of professional nursing (Simmons, Lanuza, Fonteyn, Hicks, & Holm, 2003). Clinical judgment refers to the cognitive processes involved in making judgments, which includes making sense of data and cues and is defined as an interpretation about “a patient’s needs, concerns, or health problems,” followed by a determined course of action (Tanner, 2006, p. 204). Numerous studies have investigated clinical reasoning among RNs and nursing students, often with contradictory results (White, 2003). Findings from these studies suggest that both clinical reasoning and judgment are influenced by multiple factors, such as education and the nursing environment (Johansson, Pilhammar, & Willman, 2009); thus, much debate exists regarding how these skills ought to be modeled and taught (Lasater, 2007).

To improve on the traditional nursing process model of practice, Tanner (2006) extended her earlier review (Tanner, 1998) by further examining the existing English-language literature from the United States and international sources on clinical judgment. From these two literature reviews, Tanner devised a model of clinical judgment that describes how nurses reason in complex clinical situations requiring judgment and how that could be used as a “framework for instruction” (Tanner, 2006, p. 204). This model of clinical judgment has influenced how many academic institutions teach students to develop clinical judgment and reasoning skills (Cato, Lasater, & Peeples, 2009; Dillard et al., 2009; Glynn, 2012; Lasater & Nielsen, 2009). Various educational strategies to teach these skills have shown promise according to the more recent literature (Bartlett et al., 2008; Huang, Chen, Yeh, & Chung, 2012; Palese, Saiani, Brugnolli, & Regattin, 2008), although there is still no consensus in nursing on the best teaching method (Lasater, 2007; Palese et al., 2008) or even whether these skills can be taught. To reduce the current gap in knowledge and to work toward resolving this debate, researchers continue to try to deepen their understanding of clinical judgment and reasoning and the factors influencing these complex processes (Ramezani-Badr, Nasrabad, Yekta, & Taleghani, 2009).
OBJECTIVE

The current systematic review aims to update the body of knowledge, specifically on clinical judgment and reasoning in nursing, since Tanner’s review (2006), using the five conclusions she identified to guide the analysis. The findings can be used to explore the implications for clinical and educational settings.

METHOD

Design and Sample

Four electronic databases (PubMed®, CINAHL®, MEDLINE®, and ERIC®) were searched between August 2012 and September 2012 to identify studies pertaining to clinical judgment and reasoning in nursing from 1980 to 2012 using the search terms clinical judgment [and] nursing and clinical reasoning [and] nursing.

The initial search identified 2,353 articles (Figure). After screening the titles and eliminating duplicates, 977 articles remained. In the abstract review that followed, studies were rejected if they were not specific to nursing, did not address clinical judgment or reasoning, were not in the English language, or were not published in peer-reviewed journals. At this stage, due to the scope of the current article, the number of articles to be reviewed was reduced to studies conducted after Tanner’s review (2006); therefore, full-article review was limited to 23 articles, of which seven were quantitative studies, 12 were qualitative studies, and four used a mixed-methods design. Considering the revised date range, these 23 studies were selected from 743 articles identified in the initial search, of which 544 remained after the elimination of duplicate articles. All studies included RNs, nurse practitioners, or undergraduate RN students.

Analysis

The seven quantitative studies were appraised using the Cochrane Collaboration’s tool for assessing risk of bias (Higgins, Altman, & Sterne, 2011). This tool assesses validity based on the following six criteria: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, and selective reporting.

The 12 qualitative studies were appraised using the Worksheet for Critical Assessment of Qualitative Research, which was adapted from Forchuk and Roberts (1993). This tool examines the appropriateness of a study’s research design, the qualitative research method, the literature review, and conclusions. Its criteria also assess the adequacy of the study in describing the participants, context, researcher, information gathering and analysis, and clinical relevance of the findings. All studies using a mixed-methods design were assessed using both of the aforementioned appraisal tools to evaluate the qualitative and quantitative components of the study.

The research team consisted of two doctorally prepared nurse educators (D.P., J.K.E.) and a third-year undergraduate honors program student (A.C.). The purpose and parameters of the current review was established by the nurse educators, and all studies were initially evaluated by the third researcher. The research team met on a regular basis to review the effectiveness and rigor of the search strategies to determine the relevancy of the articles and their findings to the stated objectives of the review and to discuss emergent findings. Conclusions drawn from the analysis of the articles and their fit with Tanner’s (2006) conclusions were derived from discussion and consensus of the research team.

After evaluating the methodological quality of the identified studies, 15 articles were included for the purpose of conducting this systematic review, nine of which were qualitative, five were quantitative, and one used a mixed-methods design. The excluded qualitative studies failed to provide a transparent audit trail or failed to describe the means used to confirm the findings of the researcher (e.g., member checks). The excluded quantitative studies were subject to threats to internal validity, such as their failing to mask outcome assessors or to indicate why the study did not require means of avoiding detection bias.

Data Abstraction

Data from the 15 included studies were extracted on the aim, population, setting, methodology, and key findings of each article (Table A; available in the online version of this article). This information was used to summarize the findings on clinical judgment and reasoning in nursing since 2006.

The data were analyzed and classified under one of the following five conclusions outlined by Tanner (2006, p. 204):

- Clinical judgments are more influenced by what the nurse brings to the situation than the objective data about the situation at hand.
- Sound clinical judgment rests to some degree on knowing the patient and his or her typical pattern of responses, as well as engagement with the patient and his or her concerns.
- Clinical judgments are influenced by the context in which the situation occurs and the culture of the nursing unit.
- Nurses use a variety of reasoning patterns alone or in combination.
- Reflection on practice is often triggered by breakdown in clinical judgment and is critical for the development of clinical knowledge and improvement in clinical reasoning.

In addition, many studies have examined the influence of education on decision making—a topic that was not identified specifically within one of Tanner’s (1998, 2006) previous conclusions, despite the presentation of her model as a potential guide to educational programming. To address this...
potential and important gap, the authors of the current study recommend the addition of a sixth conclusion—education strategies to improve clinical judgment may influence what a nurse brings to the situation—to Tanner’s previous synthesis of the literature.

RESULTS

Clinical Judgments Are More Influenced by What the Nurse Brings to the Situation Than the Objective Data About the Situation at Hand

Tanner’s (2006, p. 205) first conclusion suggested that decisions are influenced by nurses’ preestablished perspectives and a predisposition to what they consider should be done, or what is right. These perspectives are influenced by the values orientation, the theoretical knowledge, and the clinical experience of the nurse, and these, in turn, influence nurses’ “initial grasp” on and reasoning in clinical situations (Tanner, 2006, p. 209). For example, knowledge acquired from past similar situations lead an experienced nurse to respond intuitively, whereas beginning nurses rely more on textbook knowledge (Tanner, 2006). In concurrence with previous findings, the studies by Johansson et al. (2009) and Ramezani-Badr et al. (2009), which were published since Tanner’s review, found that the decision making of nurses was influenced by experience and “similar past situations” (Ramezani-Badr et al., 2009, p. 353). In comparing clinical reasoning strategies of novice and experienced nurses to those of specialist nurses, Andersson, Klang, and Peterson (2012) found that specialist nurses used more holistic and “hypothesis-driven” approaches to decision making (p. 876), whereas less experienced nurses reasoned through a “task- and action-oriented approach” (p. 873) and analyzed situations more superficially, without generating the types of questions that allowed nurses using a hypothesis-driven approach to more fully interpret and “grasp the wholeness of the case” (p. 874).

In contrast, Yang and Thompson (2011) compared nursing students to RNs on their ability to correctly assess risk in high-fidelity simulation (HFS) scenarios and found that the experience of nurses does not necessarily correlate positively with the quality of their clinical judgments. Essentially, Yang and Thompson suggested that there were no significant between-group differences found in judgment performance.

The contradictory findings of these studies suggest that the role of experience in clinical judgment or of what the nurse brings to clinical judgment and reasoning is not yet fully established or understood.

Sound Clinical Judgment Rests to Some Degree on Knowing the Patient and His or Her Typical Pattern of Responses, as Well as Engagement With the Patient and His or Her Concerns

Tanner’s (2006, p. 206) second conclusion suggested that knowing how a patient typically responds and knowing the patient as an individual affects nurses’ judgment of what is important to and for the patient. Recent research has demonstrated that time may be an important factor in this aspect of clinical reasoning; knowing a patient over an extended period of time allows for more holistic and “complex reasoning” than in nurse–patient relationships that are time restricted (Funkesson, Anbäckén, & Ek, 2007, p. 1110). While examining the clinical reasoning that was used by Swedish nurses during nursing home care planning, Funkesson et al. (2007) found that nurses who worked closely with patients were able to consider more perspectives when reasoning than did “consultant nurses,” (p. 1111) who rarely provided direct patient care. This holistic approach to reasoning allows for sound, ethical nursing care (Funkesson et al., 2007); therefore, it is not only an important constituent in clinical judgment, but it also provides a critical benefit in patient care.

The benefits of knowing the patient were further demonstrated by Elliott (2010), who identified “negotiation and compromise” as clinical judgment strategies (p. 2718). Elliott (2010) found that nurse practitioners who use body language that conveys interest and concern were better able to negotiate care decisions with patients than nurse practitioners who did not use these forms of nonverbal communication.

The findings of these recent studies confirm the importance of patient engagement in making clinical judgments that are relevant for the patient and are clinically sound and ethical. These findings suggest that the amount and quality of time spent in contact with patients is critical to developing clinical reasoning and sound judgments and is strongly supportive of this conclusion in Tanner’s (2006) review.

Clinical Judgments Are Influenced by the Context in Which the Situation Occurs and the Culture of the Nursing Unit

Tanner’s (2006, p. 206) third conclusion suggested that clinical judgment is influenced by contextual factors that are specific to the nurse’s working environment and range from social factors, such as patients’ socioeconomic status, to political factors, such as the extent of nurses’ mandated duties.

One of the contextual factors examined within recent research is the extent of the use of various sources of information that are available to inform clinical reasoning and judgment in the nursing unit. Research by Marshall, West, and Aitken (2011) in an Australian intensive care unit identified “information from colleagues” (p. 224) as being the preferred source of information for nurses, whereas text and electronic sources were seen as being too variable in content and too inconvenient to access under “time pressures” (p. 234). In contrast to these findings, Ramezani-Badr et al. (2009) investigated four Iranian critical care settings and found that nurses frequently referred to research papers and scientific texts when reasoning, especially before prescribing new drugs. Nurses also consulted colleagues and physicians as a clinical reasoning strategy, mostly when managing complicated cases (Ramezani-Badr et al., 2009).

The study by Ramezani-Badr et al. (2009) also addressed the impact of power differentials in making clinical decisions, which Tanner (2006) previously identified as a factor that limits the ability of nurses to problem solve and “intervene effectively” (p. 206). This finding was supported by nurses within the Iranian critical care context studied by Ramezani-Badr et al., who expressed concern that their duty lists were too limited to meet their patients’ needs, but they feared the legal repercussions of going beyond these duties. Hence, when making
decisions and provided with limited authority by physicians, the nurses carried out their decisions based on “patients’ risk–benefits and organizational necessities” (Ramezani-Badr et al., 2009, p. 357). Wang, Chien, and Twinn (2012) found that the clinical decision making of Chinese nurses was also influenced by their limited autonomy, which is considered low in comparison with nurses in Western countries.

Findings from the studies in this current review suggest that the context of a unit, which includes how information is gathered and shared, as well as the broader culture in which nursing is situated, influences the types and depth of clinical judgments that nurses make. The notion of the broader culture extends thinking beyond that of the organization or organizational unit that was captured in Tanner’s (2006) previous literature review.

**Nurses Use a Variety of Reasoning Patterns Alone or in Combination**

Tanner’s (2006, p. 207) fourth conclusion identified the use of three interrelated reasoning patterns, one or more of which may be elicited based on the situation that the nurse encounters or based on his or her level of experience. These reasoning patterns are termed analytic processes, intuition, and narrative thinking (Tanner, 2006, p. 207). The findings by Ramezani-Badr et al. (2009), which identified intuition and the analytic process of “hypothesis testing” as clinical reasoning strategies (p. 354), as well as the strategy of “recognizing similar situations” (p. 353), support Tanner’s conclusions. The “recognizing similar situations” strategy is described as a “conscious process” of applying intuition, whereas intuition itself is an “unconscious” process (Ramezani-Badr et al., 2009, p. 353). The strategy of hypothesis testing, which involves consideration of several options, allowed nurses to consider more decision-making criteria during clinical reasoning than did intuition or recognizing similar situations, including “patients’ risk–benefits” and “organizational necessities” (Ramezani-Badr et al., 2009, p. 356).

Reasoning patterns were also investigated by Funkesson et al. (2007), who found that within the nursing home setting, the reasoning process involved in planning was “dominated by routine thinking” (p. 1117). Because of cognitive shortcuts used in this type of intuitive and nonlinear reasoning, routine thinking may be prone to systematic biases (Thompson et al., 2009), such as “overconfidence” and “hindsight” (Thompson, 2003, p. 230). This was similarly demonstrated by Thompson et al. (2009) in a judgment analysis of 245 acute care nurses in the Netherlands, United Kingdom, Canada, and Australia. Nurses relying on intuitive reasoning were frequently mistaken in their risk assessments of computer-presented clinical scenarios, and they often overestimated risk (Thompson et al., 2009). In contrast, in a qualitative study by Glynn (2012), the adoption of linear reasoning strategies through “structured reflective practice” (p. 137) enhanced clinical confidence of baccalaureate nursing students, where students learned to prioritize when making clinical judgments.

Overall, the process and content of clinical reasoning strategies can vary substantially from one nurse to another, as exemplified within the context of care planning (Funkesson et al., 2007), which is supportive of the conclusion that Tanner (2006) developed in proposing her original model.

**Reflection on Practice Is Often Triggered by Breakdown in Clinical Judgment and Is Critical for the Development of Clinical Knowledge and Improvement in Clinical Reasoning**

Tanner’s (2006, p. 207) fifth and final conclusion addressed how reflection enhances the learning of nurses from their actual or perceived errors in clinical judgment. Tanner identified that the literature that couples reflection and clinical judgment comprises only a small portion of the large body of literature on reflection in general. In congruence with this finding, only one study included in this review specifically examined how reflection on practice helps to improve clinical judgment in nursing.

Glynn (2012) demonstrated the benefits of reflection by exposing baccalaureate nursing students to classroom “structured reflective practice” (p. 137), which is based on Tanner’s model (2006). Students were interviewed at the beginning and end of their academic semester and reported “a perceived improvement related to the development of clinical judgment and clinical confidence” (Glynn, 2012, p. 137). These structured reflective narrative sessions allowed nurses to share knowledge and learn from one another (Glynn, 2012). The study by Glynn suggested that reflection is an important strategy to develop in nursing students and that reflection is an important component of clinical judgment.

**DISCUSSION**

**Emergence of a Sixth Conclusion**

During this current literature review on clinical judgment and reasoning, a sixth possible conclusion emerged, which may suggest the need to extend Tanner’s (2006) synthesis of the literature. The authors observed that although several articles from 2006 to the present focused on the development of clinical judgment and reasoning through education, compared with understanding clinical judgment and reasoning, no conclusion in the previous review by Tanner (2006) specifically addressed this area. The movement from understanding to action in a suggested sixth conclusion—education strategies to improve clinical judgment may influence what a nurse brings to the situation—is reflective of how Tanner’s original model has been used to guide action through further research and practice. This sixth conclusion would mirror how clinical judgment and reasoning, which are involved in using knowledge, experience, and understanding of the patient to make sense of cues and information, are used to guide clinical decision making, which is the action component of both processes.

Several strategies for improving clinical judgment have been investigated in the studies reviewed, with the aim of finding the best educational approach to help beginning nurses to bridge the theory–practice gap. HFS has been a recurrent strategy in the studies included the current review (Lasater, 2007; Lasater & Nielsen, 2009; Yang & Thompson, 2011). To assess the effectiveness of HFS in students’ development of clinical judgment, Lasater (2007) qualitatively analyzed data from students’ experiences with HFS and their subsequent debriefing sessions. Although HFS manikins are unable to exhibit nonverbal and certain physiological cues, students found that the realism this educational approach offers helped to enhance their awareness...
in the clinical setting, such as while monitoring vital signs in patients (Lasater, 2007). In a further study, Lasater and Nielsen (2009) investigated the benefits of engaging students in concept-based learning activities prior to experiencing HFS. Evaluation using the Lasater Clinical Judgment Rubric found that students exposed to concept-based learning scored statistically significantly higher in their clinical judgments during HFS than did students who were not exposed (Lasater & Nielsen, 2009).

The Outcome-Present State Test (OPT), a nursing process model, is another educational tool used to promote the development of clinical judgment in nursing students. The OPT model requires that students compare the criteria of the patient’s present health state with the criteria of the desired outcome state to determine the most plausible nursing diagnosis for the presenting health concern (Pesut & Herman, 1998). Bartlett et al. (2008) found that most undergraduate nursing students became adept at using the OPT model over a 15-week clinical course. Use of this OPT model enhanced students’ clinical reasoning skills and knowledge of nursing language (Bartlett et al., 2008).

A double-pragmatic trial conducted in Italy tested another set of strategies. The study found that students in laboratory and intensive clinical tutorials made significantly fewer errors in judgment when examining case studies than did students who received only routine tutorial sessions (Palese et al., 2008).

Educational approaches to improving clinical judgment have not been limited to the academic sector. Huang et al. (2012) implemented a 16-week case study program for Taiwanese hospital-based nurses. Nurses whose programs used case studies, combined with concept maps, showed greater improvement in critical thinking skills than nurses who were exposed to case studies alone, although both groups displayed significant pretest–posttest changes (Huang et al., 2012). These enhanced critical thinking skills correspond to the “appropriate clinical decision-making” required for making sound judgments (Huang et al., 2012, p. 747).

The use of strategies such as HFS and concept-based learning suggest promise in promoting students’ and nurses’ reflective abilities; however, the studies reviewed suggest that no single strategy is sufficient to develop clinical judgment and reasoning. In addition, the focus on strategies such as HFS, concept-based learning, and cognitive maps in the reviewed studies may be reflective of the relatively recent emergence of these strategies, rather than their efficacy. In addition, these studies examine a range of roles and cultures, thus adding to the difficulty in identifying best educational practices. At this time, the review did not conclusively determine that any educational strategy was better than another to develop clinical reasoning and judgment.

**Ongoing Complexity in Clinical Decision Making**

In making clinical decisions, which are the basis of patient care, nurses are influenced by a number of factors, including education, experience, time pressures, and the culture of the nursing unit (Johansson et al., 2009). Because clinical decisions or actions arise from clinical reasoning and judgment, understanding clinical judgment and reasoning allows for the improvement of these skills. Being able to make sound judgments is important for clinical practice because effective decisions are more likely to result in positive patient outcomes (Ramezani-Badr et al., 2009), which include building strong relationships with patients and facilitating patient health (Elliott, 2010). The current literature review suggests that recent research is largely supportive of Tanner’s (2006) model; however, the authors recommend the addition of a sixth conclusion to Tanner’s (2006) synthesis of the literature—education strategies to improve clinical judgment may influence what a nurse brings to the situation. The addition of this conclusion potentially takes understanding of clinical reasoning and judgment, which is highlighted in Tanner’s model, to a responding level, and it is important to provide impetus for further research into how to develop these skills.

The findings of the current review indicate that sources of information on which clinical reasoning and judgments are based vary in accessibility from one nursing unit to another. Although consultation with colleagues and physicians is convenient, it “may contribute to variability” in clinical decision making (Marshall et al., 2011, p. 233). Because scientific evidence may be a more reliable source of information than opinion alone, barriers to accessing the scientific literature must be identified and overcome to decrease this variability. By ensuring that peer-reviewed articles and scientific texts are readily accessible, nurses may implement more evidence-based approaches to their clinical decision making.

The current review also acknowledges how nurses in certain countries are unable to meet their patients’ needs due to their limited authority (Ramezani-Badr et al., 2009; Wang et al., 2012), which is reflective of the influences of the broader culture on nursing practice and on clinical reasoning and judgment. Further research is needed of potential strategies for increasing the autonomy of these nurses to improve patient care, as well as of the interaction between the broader culture and nursing practice itself.

**EDUCATIONAL IMPLICATIONS**

The findings of the current review warrant further investigation of HFS, which shows promising evidence as an educational tool for developing students’ clinical judgment and reasoning skills (Lasater, 2007). Compared with other educational methods, such as written case studies, HFS may more closely resemble the clinical setting (Yang & Thompson, 2011); thus, it shows strong potential in helping to bridge the theory–practice gap (Lasater, 2007).

Despite the promising findings of the use of HFS, the studies that were reviewed, although limited in number, indicate that there is no one strategy, alone or in combination, that is considered most effective in developing clinical reasoning and judgment. Ongoing research needs to provide careful consideration of the limitations and benefits of HFS, as well as consideration of other approaches, such as concept-based learning, and to maintain openness to other methods to provide best evidence about the development of reasoning and judgment skills.

**LIMITATIONS**

The quality assessment of the articles reviewed was limited to English language publications only, and the possibility ex-
ists that other non-English studies might have impacted the results.

Given that several included studies were conducted outside of North America, it is also important to note that studies from different cultural settings may be impacted by different educational and clinical practices and, therefore, their applicability to settings outside their own must be considered carefully.

CONCLUSION

Making sound clinical judgments is essential to providing appropriate patient care. The continued research on this topic highlights the gaps in knowledge that remain in our understanding of clinical judgment and reasoning. Beginning nurses face the challenge of overcoming the theory–practice gap, whereas experienced nurses must avoid being dominated by routine thinking, which may not produce judgments that are in an individual patient’s best interests. By improving ways to teach the development of these processes in both nursing students and practicing nurses, nurses can learn to balance intuitive and evidence-based thinking to make moral and effective clinical decisions.

Reviews such as those undertaken by Tanner (1998, 2006) assist in synthesizing the evidence related to clinical judgment and reasoning by offering models and conclusions that guide further consideration and research in this area. The validity of the model is supported by the current systematic review of studies since Tanner’s work. The conclusions of the current study support the premise that clinical judgment is a process that develops over time in the nurse who consistently reflects in action and on action and responds accordingly. Consideration of the broader cultural context on clinical judgment and reasoning extends Tanner’s model, as well as the proposal of a sixth conclusion related to how clinical reasoning and judgment are developed. Ongoing work in the area of clinical judgment and reasoning suggests that there is still much to be known about the nature of these skills, as well as how best to teach them.

REFERENCES


Dillard, N., Sideras, S., Ryan, M., Carlton, K.H., Lasater, K., & Siktaberg, L. (2009). A collaborative project to apply and evaluate the clinical judgment model through simulation. Nursing Education Perspectives, 30, 99-104.


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<td>Randomized controlled trial</td>
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<td>Lasater (2007)</td>
<td>Qualitative data analysis</td>
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<td>One focus group was nontraditional in composition, thus limiting the transferability of the results to other educational settings</td>
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<td>Lasater &amp; Nielsen (2009)</td>
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<td>Lack of standardization between clinical groups on how concept-based learning was taught by faculty</td>
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<td>To explore the preferred sources of information used in CDM by intensive care unit nurses</td>
<td>Due to time pressures, nurses preferred information from colleagues (most accessible and useful) as opposed to text and electronic sources. The nursing literature was seen as too variable and too inconvenient to access.</td>
<td>Absence of bedside computers limits the transferability of the findings to other settings</td>
</tr>
<tr>
<td>Palese, Saiani, Brugnolli, &amp; Regattin (2008)</td>
<td>Pretest–posttest design</td>
<td>RN students (n = 144) from the Universities of Verona and Udine, Italy</td>
<td>To establish whether laboratory, weekly, or intensive tutorial strategies have a greater impact on enhancing critical thinking and accuracy of CR compared to routine tutorial strategies</td>
<td>Students in laboratory and intensive clinical tutorials demonstrated fewer errors compared with Students exposed to routine tutorials (OR = 3.75; 95% CI [1.77, 7.88]). Students who made several errors reported excessive confidence.</td>
<td>No correction applied to address the risk of multiple comparisons error</td>
</tr>
<tr>
<td>Ramezani-Badr, Nasrabad, Yekta, &amp; Taleghani (2009)</td>
<td>Qualitative descriptive study using content analysis</td>
<td>Critical care nurses (n = 14) from four educational hospitals affiliated with Tehran University of Medical Sciences</td>
<td>To explore CR strategies and criteria for CDM</td>
<td>Three themes were identified concerning CR strategies: intuition, recognizing similar situations, and hypothesis testing. Three more themes were identified regarding criteria used by participants to make decisions: patients’ risk–benefits, organizational necessities (i.e., regular duty lists and physician’s orders), and complementary sources of information (e.g., colleagues, research papers). Participants felt that their duty lists were too limited to meet the needs of most patients.</td>
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<tr>
<td>Thompson et al. (2009)</td>
<td>Judgment analysis of risk assessment</td>
<td>RNs (n = 245) from Dutch, United Kingdom, Canadian, and Australian acute care settings</td>
<td>To explain how nurses use the kinds of clinical information present in many early warning scoring systems when deciding whether a patient is at risk of a critical event</td>
<td>Nurses varied considerably in their risk assessments, which were largely inaccurate and overestimated risk on average. Nurses relied on intuitive and nonlinear reasoning. ANOVA revealed significant interaction between location and critical care experience in estimating risk.</td>
<td>Paper based scenarios may threaten ecological validity</td>
</tr>
<tr>
<td>Author</td>
<td>Methodology</td>
<td>Population/Setting</td>
<td>Study Objective</td>
<td>Synopsis of Critical Findings</td>
<td>Limitations</td>
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<tr>
<td>Wang, Chien, &amp; Twinn (2012)</td>
<td>Qualitative exploratory study using content analysis</td>
<td>Baccalaureate-prepared RNs ($n = 12$) from one teaching hospital in Tianjin, China</td>
<td>To explore the perceptions of Chinese RNs on the concept and practices of CDM</td>
<td>Two major themes were identified: functional perspectives of CDM and perceived autonomy in CDM. Chinese nurses tend to have low autonomy compared to nurses in Western countries.</td>
<td>Risk of social desirability bias during data collection</td>
</tr>
<tr>
<td>Yang &amp; Thompson (2011)</td>
<td>Comparative clinical judgment analysis</td>
<td>Nursing students ($n = 63$) from the Department of Health Sciences at the University of York and experienced RNs ($n = 34$) from acute and critical care units in North Yorkshire, England</td>
<td>To examine the effects of nurses’ experience on judgment performance during risk assessments made on physical- and paper-simulated patients</td>
<td>Experienced nurses displayed more consistently correct judgment with paper patients ($p = 0.04$). Their clinical experience offered no significant advantage on judgment consistency in the higher fidelity physical simulation. Clinical experience is not necessarily a surrogate measure of CJ quality.</td>
<td>Risk of nonrepresentative subgroups due to nonrandom sampling</td>
</tr>
</tbody>
</table>

Note. CR = clinical reasoning; OPT = Outcome Present-State Test; CJ = clinical judgment; NP = nurse practitioner; CDM = clinical decision making; HFS = high-fidelity simulation; OR = odds ratio; CI = confidence interval; ANOVA = analysis of variance.