ABSTRACT
The purpose of this study was to determine whether there was a relationship between critical thinking skills and clinical judgment in nurse practitioner students. The study used a convenience, nonprobability sampling technique, engaging participants from across the United States. Correlational analysis demonstrated no statistically significant relationship between critical thinking skills and examination-style questions, critical thinking skills and scores on the evaluation and reevaluation of consequences subscale of the Clinical Decision Making in Nursing Scale, and critical thinking skills and the preceptor evaluation tool. The study found no statistically significant relationships between critical thinking skills and clinical judgment. Educators and practitioners could consider further research in these areas to gain insight into how critical thinking is and could be measured, to gain insight into the clinical decision making skills of nurse practitioner students, and to gain insight into the development and measurement of critical thinking skills in advanced practice educational programs. [J Nurs Educ. 2014;53(3, Suppl.):S26-S29.]

ADVANCED NURSING PRACTICE REQUIRES DAILY COMPLEX CLINICAL DECISION MAKING IN A TIMELY MANNER. Florence Nightingale (1860) developed the role of the nurse in the gathering of data, observations, and careful evaluation and interpretation. Nightingale was a pioneer in applying data (evidence) to support decision making, and this continues to be a key component of evidence-based practice. Decision making is a key component of practice for nurses at any level of practice (Benner, Hughes, & Sutphen, 2008; de la Cruz, 1994; Harper, 1985; Ingersoll, McIntosh, & Williams, 2000; Royle et al., 2000; Wood 1972), but it increases in complexity as nurses enter advanced practice. The ability to perform accurate clinical assessment, identify patients’ problems, and develop an appropriate plan of care are key components of practice (American Association of Colleges of Nursing, 1996, 2010; American Nurses Association [ANA], 2004; Tanner, Padrick, Westfall, & Putzier, 1987).

Fundamental to decision making is the nursing process, a model that guides the nurse’s thinking. Data and information about patients must be analyzed using critical thinking and clinical judgment as nurses develop a plan of care. Recently, the ANA (2010) stated, “The Standards of Practice describe a competent level of nursing care as demonstrated by the critical thinking model known as the nursing process” (p. 9). Nurses are expected to make decisions in the clinical setting for each patient. The educational standards call for nurses to use critical thinking and judgment as they make decisions related to patient care.

When nurses return for education as nurse practitioners (NPs), they are expected to increase critical thinking and clinical judgment and demonstrate a higher level of decision making. The assumption is made that critical thinking skills lead to better clinical judgment. Both must then be measured to evaluate achievement. This study was undertaken to investigate whether there was a relationship between critical thinking skills and clinical judgment, as measured by established tools.

CRITICAL THINKING IN ADVANCED PRACTICE NURSING
Several authors have discussed critical thinking within the advanced practice arena (Rash, 2008; Weber, 2005; Zunkel, Cesarotti, Rosdahl, & McGrath, 2004). However, the strategies have not been evaluated with outcomes data. Case scenarios (Cole & Ramirez, 2000) and critical thinking exercises throughout the curriculum (Youngblood & Beitz, 2001) have been implemented but have not been evaluated as affecting outcomes other than student satisfaction. Student satisfaction was improved with...
the new learning interventions; however, effectiveness has not been demonstrated. It is this lack of evidence related to critical thinking and clinical judgment that was one of the key factors behind the current study. In addition, nurse researchers can use this lack of evidence to further determine whether critical thinking can be assessed in the advanced practice nursing education environment.

**Defining Critical Thinking**

In an attempt to assess critical thinking in the advanced practice nursing environment, a definition for critical thinking was selected that had been used in prior studies evaluating critical thinking in the undergraduate nursing education environment. Facione (1990) described a critical thinker as being: 

...habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. (p. 2)

**Research Question**

This study investigated the question, “Is there a relationship between critical thinking and clinical judgment in advanced practice nursing students?” If critical thinking is shown to be related to clinical judgment in a positive way, then critical thinking may be a determiner of clinical decision making. The following three assumptions guided the study:

- NP students who demonstrate higher scores on the California Critical Thinking Skills Test (CCTST) will demonstrate more accuracy in the formulation of differential diagnoses as determined by their results on the examination-style questions.
- NP students who demonstrate higher scores on the CCTST will demonstrate higher scores on the evaluation and reevaluation of consequences subscale of the Clinical Decision Making in Nursing Scale (CDMNS).
- NP students who demonstrate higher scores on the CCTST will demonstrate more accuracy in the formulation of differential diagnoses as determined by the preceptor clinical evaluation tool.

**Method**

A descriptive survey method was used to gather information from NP students through an online platform. NP students from across the United States comprised a convenience, nonprobability sample. The inclusion criterion was family NP students who were within 1 year of completing a master’s-level program. The sample size was determined by power analysis using G*Power 3.1.0 (Faul, Erdfelder, Buchner, & Lang, 2009). With a moderate effect size ($r = 0.30$) and significance level of 0.05 for correlation analysis, the sample size was set at 50 students. This sample size provided a power analysis of 0.71 for correlation.

After obtaining institutional review board approval, approximately 80 family NP educational program directors were contacted to inquire about potential student participation. Seventy of the programs agreed to forward the study information to their students, and a representative of each program provided the study information to the students. Invitations for participation also were sent to several nursing-related electronic mailing lists (NRSINGED, NRSEDRES, and MMNP) and placed on Web sites or social media networks (Facebook®, LinkedIn®, and Twitter®).

The study was explained to the students, emphasizing that the information collected would remain confidential and that participation was voluntary. Students were provided with informed consent documentation via e-mail or hard copy. After providing consent to participate in the study, students completed the questionnaires electronically.

Mean age of the participants was 36.18 years (range = 23 to 53 years, median = 34.5 years, $SD = 10.05$). Mean years of nursing experience of the participants was 10.2 years (range = 0 to 33 years, median = 6 years, $SD = 8.8$). Regarding participants’ educational pathway, 66% came from a baccalaureate degree in nursing (BSN) program to their current master’s in nursing (MSN) program; 16% came from an associate degree in nursing (ADN)-to-BSN to their current MSN program; and 10% had earned a prior master’s degree, entered a BSN program, and then entered their current MSN program. The remaining 8% of participants had a mixed educational pathway history.

**Measurement Tools**

To assess critical thinking skills, the CCTST was used. This tool demonstrates strong correlation with the Graduate Record Examination (GRE®) total (0.719), GRE Verbal (0.791), and GRE Analytic (0.708) scores (Facione, 2000). The reported internal consistency ranges from 0.78 to 0.80 with the Kuder-Richardson formula (Facione, 2000). The total score can range from zero to 34, by totaling scores on the three subscales (analysis, inference, and evaluation).

To assess clinical judgment, two approaches were used. One approach used examination-style questions taken from examinations administered in several NP student courses. These questions required students to formulate appropriate differential diagnoses based on the information presented in the question. The questions selected for use demonstrated point biserial correlation ranging from 0.26 to 0.72. The second approach used the CDMNS, which was developed by Dr. Helen Jenkins (1985). The CDMNS was selected for use because of its subscale of evaluation and reevaluation of consequences, making it an outcomes-oriented assessment scale. The 40-item tool has a Cronbach’s alpha of 0.83.

A preceptor evaluation tool was used to assess the NP students’ ability within the clinical setting to formulate appropriate differential diagnoses. The tool was developed from existing tools and reviewed by experienced NP educators for content validity. Based on feedback, the tool was modified and the reviewed a second time by experienced NP educators for content validity.

The CCTST scores and subscales were evaluated. The overall scores on the CCTST ranged from 1 to 28, indicating that these students were performing at a varied level of critical thinking. According to the *CCTST 2010 Test Manual* (Facione, Facione, Blohm, & Gittens, 2010), total CCTST “scores at or
above 25 indicate relative strength in overall critical thinking skills,” “scores in the mid range (12-24) are satisfactory and associated with demonstrated competence in critical thinking,” and “true CCTST test scores between 0 and 11 indicate serious deficiencies in critical thinking skills” (p. 29).

Results

CCTST

The examination-style questions required the participants to evaluate the described situation, determine the correct differential diagnosis, and then correctly identify the course of treatment for the case described. Scores ranged from 10 correct to only three correct (mean = 6.92, SD = 1.81). The Table shows descriptive data from the CCTST. Point biserial values for the examination questions also were calculated and ranged from –0.056 to 0.399, with p values ranging from 0.53 to 0.90. These findings were quite different from previously reported point biserial values. When the questions were used in examinations, point biserial values ranged from 0.26 to 0.72. Further analysis using the Kuder-Richardson Formula 20 (0.443) demonstrates there is low reliability and little support for the continued use of the examination questions in subsequent analysis.

CDMNS

The CDMNS tool provides an overall score and four other subscales (Search for Alternatives and Options, Canvassing of Objectives and Values, Evaluation and Reevaluation of Consequences, and Search for Information and Unbiased Assimilation of New Information) that can be evaluated individually. In this study, only the Evaluation and Reevaluation of Consequences subscale was used. This subscale has 10 questions, with each question having a value of 1 to 5. Cronbach’s alpha for the CDMNS evaluation and reevaluation subscale (α = 0.670) was lower than anticipated (Table).

Preceptor Evaluation Tool

Participants provided contact information for their clinical preceptor. The preceptors had been approved by the NP students’ educational program as being acceptable for the role. Fewer than 10 of the preceptors were physicians. Preceptors were contacted to seek their feedback on seven statements related to the NP students’ ability within the clinical setting. The ranking scale for these statements ranged from 1 (no ability) to 10 (excellent ability). On this tool, the highest possible score was 70 and the lowest possible score was 10. Overall scores ranged from 24 to 69 (mean = 53.67, SD = 9.53). Cronbach’s alpha, assessing reliability of the tool, was α = 0.917. No interrater reliability assessment was performed.

Statistical Analysis

The reliability of the instruments used in this study was evaluated to determine whether the items within each tool were closely related. Cronbach’s alpha was used for the CCTST (α = 0.809), CDMNS evaluation and reevaluation subscale (α = 0.670), CDMNS overall (α = 0.738), and the preceptor tool (α = 0.917) as these tools use Likert-type scales. The Kuder-Richardson Formula 20 statistic was used for evaluation of the examination-style questions (0.443) as the data for this instrument were dichotomous. Further data analysis was completed using SPSS® to compute Pearson’s correlation. Statistical analysis of the relationship between overall critical thinking skills and the evaluation and reevaluation subscale of the CDMNS (r = 0.011, p = 0.940) demonstrated no significant relationship between the two variables. Statistical analysis of the relationship between overall critical thinking skills score and the preceptor tool (r = 0.153, p = 0.306) demonstrated no significant relationship between these two variables.

Discussion

This exploratory study found no statistically significant relationship between critical thinking skills as measured by
the CCTST and clinical decision making as measured by the CDMNS. This raises the question of the value of critical thinking in clinical judgment by NP students. Is the construct of critical thinking appropriate in assessing clinical judgment in advanced practice? Bowles (2000) found a statistically significant positive relationship between the CCTST and the overall score on the CDMNS with undergraduate students; inductive reasoning and inference were significant predictors of clinical judgment as measured by the CDMNS tool. Although Bowles had 68 data sets and the current study had 50 data sets, the inability of the current study to replicate the findings with advanced practice nursing students raises several questions: Does critical thinking play the same role in advanced practice? Are the measurement tools valid and reliable for this student population? Are the constructs of critical thinking and decision making consistently applied?

Although this exploratory study did not demonstrate any statistically significant correlation between the preceptor evaluation tool and the CCTST scores, it did highlight that the preceptor evaluation tool provides practice-based evidence related to NP student abilities in clinical decision making. This causes one to consider the role of preceptor feedback related to the ability of NP students to use clinical judgment as they make clinical decisions.

NPs are expected to demonstrate clinical decision making skills as they develop a differential diagnosis for patients. The decision making process is complex, involving a systematic and organized approach to the problem at hand (Hemaida & Kalb, 2001; Millet, 1998; Saaty, 2008). This is not a simple task for health care providers (Papa, Oglesby, Aldrich, Schaller, & Cipher, 2007), and yet it must be an outcome of the educational program for NPs. Literature has provided anecdotal information related to the ability of NP students to use clinical judgment to formulate a differential diagnosis. The findings of this study highlight the challenge of outcomes measurement.

Recently, Tanner (2011) addressed the lack of standardized assessment tools within nursing that are used to assess relevant learning outcomes. Therefore, the question of the appropriateness of the measurement tool and definition of critical thinking within advanced practice nursing must be considered. The call by Tanner to “develop measures that are appropriate for a clinical practice discipline” (p. 492) is cogent. To use critical thinking as an outcomes measurement, an operational definition using valid and reliable measurement tools is necessary. Many advanced practice nursing education programs speak to the development of critical thinking in the graduate nursing student population but lack the ability to measure the outcome in a meaningful way. This is clearly a necessity to evaluate learning in advanced practice nursing.

References


