Critical thinking ability and clinical decision-making skills among senior nursing students in associate and baccalaureate programmes in Korea

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Abstract

Clinical thinking ability and clinical decision-making skills among senior nursing students in associate and baccalaureate programmes in Korea

This study compared Korean senior nursing students enrolled in associate degree programs (n = 119) and baccalaureate programs (n = 115) on measures of critical thinking ability and clinical decision-making skills. Samples were drawn from three associate degree programmes and four baccalaureate programmes accredited by the Korean Ministry of Education. 'Critical thinking ability' was determined by the Watson-Glaser Critical Thinking Appraisal and 'clinical decision-making' in nursing was measured by the Nursing Performance Stimulation Instrument. Independent sample t-tests comparing the associate degree group (mean score 41.98) and baccalaureate group (mean score 47.22) on the critical thinking measure yielded significant mean differences favouring the baccalaureate group. The baccalaureate group (mean score 26.53) also scored significantly higher than the associate degree group (mean score 23.49) on clinical decision-making. Within the total sample (n = 234) the relationship between critical thinking and clinical decision-making was weak but significant (r = 0.19, P = < 0.003).

Keywords: critical thinking, clinical decision-making, senior nursing students, associate and baccalaureate programmes, Korea

INTRODUCTION

In 1965 the American Nurses' Association (ANA) [1] proposed that the baccalaureate degree should be the professional degree required for entry into nursing practice as a registered nurse.

This proposal was based on the perception that increasing the level of education required to enter the profession would result in 'increased remuneration and professional stature' (Brooks & Shepherd 1990) [3]. The NLN stated that the baccalaureate nursing curriculum must reflect critical thinking and the synthesis of learning. However, it has also been argued that the nursing
profession is quickly becoming more complex, requiring higher levels of critical thinking skills which could be developed through the foundation of a liberal education (National League for Nurses 1989) [23].

Clearly, the latter argument rests on two essential propositions: (1) that there is a relationship between the level of one’s critical thinking ability and performance in the role of the professional nurse, and (2) that critical thinking ability can be improved through the completion of a baccalaureate degree. The literature contains some support for each of these propositions.

**Purpose**

This study was conducted to measure the critical thinking ability and clinical decision-making skills of two types of nursing educational programs. In addition, the relationship between critical thinking ability and clinical decision-making skills of senior nursing students in the two types of educational programs were explored.

**LITERATURE REVIEW**

**Critical thinking ability**

Critical thinking is defined by Watson & Glaser (1964) [31] as a composite of attitudes, knowledge and skills. This composite include:

1. an attitude of inquiry that involves an ability to recognize the existence of problems and an acceptance of the general need for evidence in support of what is asserted to be true;

2. knowledge of the nature of valid inferences, abstractions and generalizations in which the weight or accuracy of different kinds of evidence are logically determined; and

3. skills in employing and applying the above attitudes and knowledge (p. 10). Matthews & Gaul (1979) [21] defined critical thinking as involving the cognitive skills of comprehension, application, analysis, synthesis, and evaluation.

Critical thinking is an essential component of precise communication, problem-solving ability, theoretical and conceptual understanding of nursing concerns, and research endeavours that advance the knowledge base of nursing. In addition, the demonstration of critical thinking in the clinical setting is a universally expected behaviour of professional nurses engaged in practice (Kemp 1985) [18].

Furthermore, nurses are expected to be able to think critically in order to process complex data and to make intelligent decisions concerning the planning, management, and evaluation of health care for their clients (Saarmann et al. 1992) [25]. Learning how to think critically is regarded as a major goal of nursing education.

**Clinical decision-making**

Clinical decision-making has been noted by many nurse researchers as one of the most critical
elements for nursing practice (Gill 1979). Hammond (1966) defined clinical decision-making as a complex process because of the vast amounts of information to be processed, and the uncertainty of outcomes. Engaging students in decision-making at the educational level ensures that new graduate nurses have had experiences in making thorough assessments, evaluating risks and benefits, and choosing correct alternatives to make the most effective clinical decisions (Jenkins 1985).

Clinical decision-making in the study is defined as the formulation of hypotheses and/or the selection of nursing interventions. Effective clinical decision-making is essential to the future of professional nursing practice (Pardue 1987, Tschikota 1993), and it is important to develop teaching strategies to effect clinical decision-making skills (Jenkins 1985, Tanner 1987). Critical thinking ability and clinical decision-making skills are believed to be closely related (Erikson 1964, Snypes 1965).

Based on samples of 2-year associate degree students, 3-year diploma students and 4-year generic baccalaureate degree students, Brooks & Shepherd (1990) reported a weak but significant \( r = 0.25 \) positive correlation between critical thinking skills and clinical decision-making. Several investigators have reported that critical thinking ability is related to academic performance, measured by grade point average, in nursing programmes (Frederickson 1979, Gross et al. 1987, Miller 1992).

Ketefian (1981) reported a significant relationship between nurse's critical thinking ability and their level of moral reasoning. Bauwens & Gerhard (1987) and Gross et al. (1987) reported significant relationships between scores on the Watson-Glaser Critical Thinking Appraisal and scores of baccalaureate students on the National Council Licensure Examination (NCLEX) scores. On the other hand there have been at least four studies that reported no significant relationships between critical thinking skills and clinical judgement (Tanner 1977, Gordon 1980, Gunning 1981, Holzemer & McLaughlin 1988).

With respect to the possible effect of a baccalaureate education on critical thinking ability, results reported have been inconclusive and mixed. Frederickson & Mayer (1977), Scoloveno (1981) and Pardue (1987) all reported that baccalaureate students scored higher than associate degree students and/or diploma students on measures of critical thinking. However, although these studies are consistent with the notion that a liberal education improves critical thinking ability, they clearly do not prove the point. The observed differences in critical thinking ability could simply be the result of greater selectivity in the baccalaureate programmes. Moreover two other studies reported no significant relationship between critical thinking ability and level of nursing education (Matthews & Gaul 1979, Dungan 1986).

However, no research has been reported to date relevant to differences between associate and baccalaureate nursing students on either critical thinking or clinical decision-making skills. Nor has any previous research been reported relevant to the relationship between critical thinking and clinical decision-making skills of Korean nursing student samples. The research reported here was designed to address these issues.
RESEARCH QUESTIONS

Questions were formulated in this study:

1 How do the two types of nursing curricular compare with each other on the variable of critical thinking as measured by the Watson-Glaser Critical Thinking Appraisal (WGCTA)?

2 How do the two types of nursing curricular compare with each other on clinical decision-making in nursing measured by the Nursing Performance Simulation Instrument (NPSI)?

3 What is the relationship between critical thinking and clinical decision-making in nursing for all programmes?

METHODS

Participants

The study participants included Korean senior nursing students enrolled in associate degree programmes (n = 119) and baccalaureate programmes (n = 115) accredited by the Korean Ministry of Education. The participants comprised convenience samples drawn from three different associate's degree programmes and four baccalaureate programmes. The participants were informed of the purpose of the study and were assured of confidentiality and anonymity. They were advised of their right to withdraw their participation at any time and written consent was obtained.

Limitations

This study does not involve drawing a random sample; generalizations of the study findings were limited. Also, since the instruments were developed in the US the cultural differences could result in some limitations.

Instruments

Two research instruments and a demographic date sheet were used for data collection. Participating students completed the Watson-Glaser Critical Thinking Appraisal, an 80-item scale consisting of five 16-item subscales measuring skills with respect to (1) inference, (2) recognition of assumptions, (3) deductions, (4) interpretations and (5) evaluation of arguments. Watson & Glaser (1980) [32] reported the internal consistency of the subscales ranged from 0.69 to 0.85 for several different norming samples. They reported a 2-week test-retest reliability of 0.73 for the overall critical thinking score.

In this study here, the Watson-Glaser Critical Thinking Appraisal was translated into Korean, and the accuracy of the translated was validated by an independent reverse-translation to English.

Participating students also completed a locally normalised measure of clinical decision-making ability modelled on the Nursing Performance Simulation Instrument (NPSI). This measure was developed at the School of Nursing of the University of North Carolina (Gover 1971) [12]. The NPSI
is a pen and pencil test and consists of four multi-item simulations devised to portray clinical situations. In simulation one, six patients are described and the respondent decides whether each of the 10 statements about related patient care is true. In simulation two, the respondent determines care priorities for six patients. In simulation three, three clinical situations are described, and the respondent chooses between pairs of alternative actions. In simulation four, the respondent chooses the proper physician referral for the six original patients. A total score is generated ranging from 0 to 53. The validity of the NPSI was established by expert review by a panel of 27 members of the clinical nursing faculty, and the authors reported a test-retest reliability of 0.63, based on a sample of 50 nurse practitioners (time interval between testings unspecified).

RESULTS

Demographic data, including age, sex and marital status, were obtained for all students in this study. In general, the group was representative of senior nursing students in the general population (Korean Ministry of Education 1994) [20]. For example, the majority of subjects were female (96.6%). Mean ages for associated and baccalaureate programmes were similar: 21.5 and 22.3 years. Marital states of the associate and baccalaureate students in this study were also similar to the larger pool of nursing students. Table 1 presents the results of independent sample t-tests comparing the students from the associate and baccalaureate programmes on the variables of interest.
The data in Table 1 indicate that the baccalaureate group scored significantly higher than the associate degree group on the Watson-Glaser sub-tests measuring inference (t = 2.43, d.f. = 232, P < 0.05), recognition of assumptions (t = 3.75, d.f. = 232, P < 0.001), and interpretations (t = 5.70, d.f. = 232, P < 0.001). The baccalaureate group was also significantly higher than the associate group on both total critical thinking (t = 6.10, d.f. = 232, P < 0.001) and clinical decision-making (t = 4.68, d.f. = 232, P < 0.001).

(Table 2) presents the inter-correlations among the critical thinking scales and clinical decision-making for the pooled sample (n = 230).

Table 1. Watson-Glaser critical thinking scales and clinical decision-making scores by student group

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Associate (n = 119)</td>
<td></td>
<td></td>
<td>Baccalaureate (n = 115)</td>
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<td></td>
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<tr>
<td>Watson-Glaser:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inference</td>
<td></td>
<td>5.32</td>
<td>1.86</td>
<td>5.96</td>
<td>2.13</td>
<td>2.43*</td>
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<tr>
<td>Recognition of assumptions</td>
<td></td>
<td>10.28</td>
<td>1.98</td>
<td>11.25</td>
<td>1.99</td>
<td>3.75***</td>
</tr>
<tr>
<td>Deductions</td>
<td></td>
<td>8.50</td>
<td>1.78</td>
<td>8.88</td>
<td>1.90</td>
<td>1.55</td>
</tr>
<tr>
<td>Interpretations</td>
<td></td>
<td>9.51</td>
<td>1.99</td>
<td>10.93</td>
<td>1.82</td>
<td>5.70***</td>
</tr>
<tr>
<td>Evaluation of arguments</td>
<td></td>
<td>9.71</td>
<td>4.19</td>
<td>10.07</td>
<td>2.22</td>
<td>0.83</td>
</tr>
<tr>
<td>Total critical thinking</td>
<td></td>
<td>41.98</td>
<td>7.39</td>
<td>47.22</td>
<td>5.66</td>
<td>6.10***</td>
</tr>
<tr>
<td>Clinical decision-making</td>
<td></td>
<td>23.49</td>
<td>4.64</td>
<td>26.53</td>
<td>5.30</td>
<td>4.68***</td>
</tr>
</tbody>
</table>

* P < 0.05, *** P < 0.001 (two-tailed).
Table 2. Pearson correlations among Watson-Glaser critical thinking scales and clinical decision-making (n = 234)

<table>
<thead>
<tr>
<th>Variable</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
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<tbody>
<tr>
<td>Watson-Glaser:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Inference (1)</td>
<td>0.13*</td>
<td>0.06</td>
<td>0.15*</td>
<td>0.20**</td>
<td>0.35***</td>
<td>0.01</td>
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<tr>
<td>Recognition of assumptions (2)</td>
<td>0.02</td>
<td>0.25***</td>
<td>-0.01</td>
<td>0.46***</td>
<td>0.20**</td>
<td></td>
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<tr>
<td>Deductions (3)</td>
<td>0.07</td>
<td>0.11</td>
<td>0.21**</td>
<td>0.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpretations (4)</td>
<td>0.19**</td>
<td>0.53***</td>
<td>0.14*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Evaluation of arguments (5)</td>
<td>0.06</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total critical thinking (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.19**</td>
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<tr>
<td>Clinical decision-making (7)</td>
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</tbody>
</table>

* P < 0.05, ** P < 0.01, *** P < 0.001 (two-tailed).

The data in Table 2 indicate that there were weak but significant, positive relationships between clinical decision-making and two of the critical thinking sub-scales: recognition of assumptions (r = 0.20, P < 0.01) and interpretations (r = 0.14, P < 0.05). Surprisingly, there was a significant negative relationship between clinical decision-making and the Watson-Glaser sub-scale measuring evaluation of arguments (r = -0.13, P < 0.05). The overall critical thinking score was related positively to clinical decision-making (r = 0.19, P < 0.01).

**DISCUSSION**

The finding of the present study confirms the same thing for Korean nursing students that a previous study by Brooks & Shepherd (1990) [3] found about nursing students in the USA. The results of the two studies were virtually identical. The baccalaureate students had higher scores than the associate degree students on both critical thinking and clinical decision-making, and there was a mildly positive relationship between critical thinking and decision-making. These findings are contrary to several studies in which critical thinking skills were found to be unrelated to clinical decision-making skills (Tanner 1997, Gordon 1980, Gunning 1981, Holzemer & McLaughlin 1988) [11,14,16]. The discrepancy in these findings is most likely because the actual relationship between critical thinking skills and clinical decision-making is weak. The correlation of 0.19 observed between overall critical thinking and clinical decision-making observed in this study was significant because of the large sample size. In a study with a relatively small sample size, a correlation of this magnitude would probably not be significant.

In any case, the magnitude of the observed correlation raises serious questions regarding the value of teaching critical thinking in the nursing school curriculum. In this study, less than 4% of the variability in clinical decision-making was explained by overall critical thinking. Such a small proportion of shared variance could be easily attributable to the common relationship of critical thinking and clinical decision-making to IQ (Friend & Zubek 1958, Glaser 1985) [8,10]. If this is the case, the observed differences between associate and baccalaureate students with respect to critical thinking scores may reflect differences in programme selectivity, rather than any effects associated with a liberal education.

Further research is required to determine whether course work unique to baccalaureate
programmes actually results in either improved critical thinking skills or improved clinical
decision-making skills. Such research would have to establish a control for initial differences in
intelligence while demonstrating a significant pre-treatment to post-treatment improvement in
critical thinking, as well as demonstrating a significant relationship between critical thinking and
clinical decision-making skills. Until such time, the value of a baccalaureate education with respect
to the clinical decision-making ability of graduate nurses remains a moot question.

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