Effects of Problem-based Learning on the Learning Attitudes, Critical Thinking Disposition and Problem-solving Skills of Nursing Students: Infant Care

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Abstract. The purpose of this study was to investigate the effects of problem based learning in regard to the study of infant care on the learning attitudes, critical thinking disposition and problem-solving skills of nursing students, and to compare the effect of problem based learning with that of traditional learning.

Methods: This research was based on a non-equivalent control group pre-post design. Measurement tools were the learning attitudes scale developed by the Korea Education Development Institute (1992) and revised by Hwang Seon Young (2003), the critical thinking disposition measuring tool developed by Yoon Jin (2004), problem-solving skills measuring tool developed by Korea Education Development Institute (2003). To analyze the program effects, paired t-test, t-test and ANCOVA were used. Results: The results of this study reveal that learning attitudes and critical thinking disposition were significantly improved in the experiment group. In terms of comparing the two groups, learning attitudes of the experiment group were significantly higher than those of control group. But critical thinking disposition, problem-solving skills were not significantly different. Conclusion: The results demonstrated that problem-based learning contributed to improving learning attitudes, critical thinking disposition and decision-making and assessment sub areas of problem-solving skills in nursing students.

Keywords: problem-based learning, learning attitudes, critical thinking disposition, problem-solving skills, infant care.

1 Introduction

A nurse should have the ability to implement proficient nursing actions in the actual field of clinical nursing as well as solve problems smoothly through knowledge based on critical thinking and efficient communication [1]. Therefore, the need for comprehensive nursing education which helps new nurses to acquire the ability to solve the nursing problems they face while engaging in nursing actions in the actual nursing field in a comprehensive manner is emphasized in nursing education.
Problem-based learning is a learning method which helps students to acquire new alternative approaches and understanding with regard to all learning environment elements including learning activities for solving problems using actual cases, reflective record and performance assessment through learner-centered role change rather than a professor-centered method [2], [3].

1.1 Purposes and Hypothesis

The purpose of this study was to investigate the effects of problem-based learning about infant care on the learning attitudes, critical thinking disposition and problem-solving skills of nursing students, and to compare the effect of problem-based learning with that of traditional learning.

The first hypothesis was: The experimental group, in which problem-based learning was applied, will have difference in scores for learning attitudes, critical thinking disposition, problem-solving skills after the intervention compared to before.

The second hypothesis was: The control group, in which traditional learning was applied, will have no difference in scores for learning attitudes, critical thinking disposition, problem-solving skills after the intervention compared to before.

The third hypothesis was: The experimental group, in which problem-based learning was applied, will have higher scores for learning attitudes, critical thinking disposition, problem-solving skills than the control group, in which traditional learning was applied.

2 Method

2.1 Research Design

This research was quasi-experimental study used a non-equivalent control group pre-post design. A problem-based learning module was developed and applied with nursing students focusing on infant care to determine its effect on students’ learning attitudes, critical thinking disposition, and problem-solving skills and to compare its effect with that of a traditional learning method.

2.2 Participants

Participants were 99 nursing students in N university located in G city. The subjects consisted of 51 nursing students in the experimental group (problem-based learning) and 48 nursing students in the control group (traditional learning).
2.3 Measurement Tools

To test the effect of problem-based learning on learning attitudes, we used the measuring tool developed by the Korean Education Development Institute (1992) [4] and revised by Hwang Seon Young (2003) to suit nursing students [5]. To measure the effect on critical thinking disposition, we used the critical thinking disposition measuring tool developed by Yoon Jin (2004) focusing on nursing [6]. For problem-solving skills, we used the problem-solving skill measuring tool for university students/adults developed by the Korean Education Development Institute (2003) [7].

2.4 Research Process

To develop the problem-based learning module, the learning goals contained in textbook chapters on pediatric nursing infant care were analyzed and conceptualized to select a detailed learning content. A teaching package and learning package for problem-based learning were developed to be utilized at each stage of the class. The validity of the scenario was evaluated by five nursing professors and clinical experts, and after a revision process, three modules were finalized. The problem-based learning module was carried out twice a week for four weeks, in a total of eight classes. Its effect on learning was recorded and analyzed through self-administered questionnaires and introspective journals.

2.5 Data Analysis

The collected data were analyzed using the SPSS/win 18.0 program. The homogeneity of the experimental group and control group was tested with a chi-square test and a t-test. To test the hypotheses, the differences in learning attitudes, critical thinking disposition, and problem-solving skills before and after the intervention were analyzed with a paired t-test, while the differences between the experimental and control groups after the intervention were analyzed with a t-test and ANCOVA.

3 Result

The results of this study are as follows:

1. The research variables measured at pretest were not different significantly in homogeneity test.
2. The first hypothesis, the experimental group in which problem-based learning was applied, learning attitudes(t=-2.40, p= .020) and critical thinking disposition(t=-2.21, p= .031) after intervention program were significantly more improved [Table 1].
3. The second hypothesis, the control group in which traditional learning was applied, learning attitudes(t=-0.45, p=.656), critical thinking disposition(t=-0.08, p=.934),
problem-solving skills((t=1.72, \( p = .092 \)) after the intervention ) were not different significantly [Table 1].

4. The third hypothesis, in terms of comparing with two groups, learning attitudes\((t=3.00, \( p = .003, \ F=7.85, \ p = .006)\) of experiment group were significantly higher than those of control group. But critical thinking disposition\((t=0.41, \( p = .681, \ F=0.37, \ p = .544)\), problem-solving skills\((t=1.71, \( p = .090, \ F=3.11, \ p = .081)\) were not different significantly [Table 2].

Table 1. Differences of Learning Attitudes, Critical Thinking Disposition, Problem Solving Skills in Each Group at Pretest and Posttest

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning attitudes</td>
<td>Exp.</td>
<td>52.8±7.96</td>
<td>55.2±5.60</td>
<td>-2.40(.020)</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>51.3±7.47</td>
<td>51.9±5.40</td>
<td>-0.45(.656)</td>
</tr>
<tr>
<td>Critical thinking</td>
<td>Exp.</td>
<td>93.7±10.43</td>
<td>98.1±10.73</td>
<td>-2.21(.031)</td>
</tr>
<tr>
<td>disposition</td>
<td>Cont.</td>
<td>97.0±10.68</td>
<td>97.2±10.81</td>
<td>-0.08(.934)</td>
</tr>
<tr>
<td>Problem solving skills</td>
<td>Exp.</td>
<td>156.1±16.97</td>
<td>158.9±23.14</td>
<td>-0.71(.479)</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>157.9±20.48</td>
<td>151.2±21.98</td>
<td>1.72(.092)</td>
</tr>
</tbody>
</table>

Exp.: experimental group\((n=51)\). Cont.: control group\((n=48)\)

Table 2. Comparison of Learning Attitudes ,Critical thinking disposition, Problem solving skills between Two Groups at Posttest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t(p)</th>
<th>F(p)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning attitudes</td>
<td>Exp.</td>
<td>52.8±7.96</td>
<td>55.2±5.60</td>
<td>3.00(.003)</td>
<td>7.85(.006)</td>
</tr>
<tr>
<td></td>
<td>Cont.</td>
<td>51.3±7.47</td>
<td>51.9±5.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical thinking</td>
<td>Exp.</td>
<td>93.7±10.43</td>
<td>98.1±10.73</td>
<td>0.41(.681)</td>
<td>0.37(.544)</td>
</tr>
<tr>
<td>disposition</td>
<td>Cont.</td>
<td>97.0±10.68</td>
<td>97.2±10.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem solving skills</td>
<td>Exp.</td>
<td>156.1±16.97</td>
<td>158.9±23.14</td>
<td>1.71(.090)</td>
<td>3.11(.081)</td>
</tr>
</tbody>
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<thead>
<tr>
<th>solving skills</th>
<th>Cont.</th>
<th>157.9±20.48</th>
<th>151.2±21.98</th>
</tr>
</thead>
</table>

Exp.: experimental group (n=51). Cont.: control group (n=48)
*Result of ANCOVA correcting learning attitudes at pretest as a covariate

4 Conclusions

The results demonstrated that problem-based learning contributed to improve learning attitudes, critical thinking disposition in nursing students. Therefore, it is recommended that problem-based learning need to be used to the active utilization in the classroom. In addition, problem-based learning subjects should be included in curriculum so that problem-based learning can be applied as part of teaching and learning methods in nursing education.

References