Effects of Debriefing Applying the Clinical Judgment Rubric on Nursing Students’ Knowledge, Skill Performance and Simulation Effectiveness

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Abstract. In this study, nursing students underwent simulation training with the aim of assessing the effects of post-simulation debriefing using a clinical judgment rubric on simulation effectiveness, students’ knowledge, and skill performance. Eighty-one nursing students enrolled in an integrated simulation course were divided into experimental and control groups through random sampling and were assigned into classes accordingly. The experimental group was debriefed using the clinical judgment rubric, the control group using typical methods. There was a statistically significant difference between groups in terms of their knowledge ($F = 4.27, p = 0.042$) and in terms of skill performance; the experimental group showed a higher increase in skill performance score after simulation training ($F = 5.88, p = 0.017$). There was a statistically significant difference between the groups in terms of simulation effectiveness with the simulation being more effective in the experimental group ($F = 22.66, p < .001$).

Keywords: Debriefing, Clinical Judgment, Skill Performance, Simulation

1 Introduction

Due to recent changes in the hospital environment, such as decreased length of hospitalization, increased numbers of critically ill patients, changes in the awareness of medical consumers, and increased patient demand, it is difficult for nursing students to receive first-hand clinical practice. Moreover, conditions such as the gap between theory and practice, lack of opportunities to acquire nursing techniques, lack of professors in clinical training, and decline in students’ willingness to receive clinical training are preventing nursing students from acquiring a diverse clinical experience [1].

Traditional education is centered on lectures and repetitive training, contributing to a passive learning environment and failing to provide sufficient training for nursing students to be able to respond appropriately to various real-life situations; it is limited in the ability to train competent nurses to achieve the level of abilities required in real
nursing practice. In order to resolve such problems, the use of simulation training is increasing as it can supplement the limitations of real practice while conveying knowledge, techniques, and appropriate attitude to students during the course of their study [2].

Simulation training comprises scenario simulation, in which students practice various situations, and debriefing, which improves students’ performance through debate, feedback, and reflection between students and instructors relating to the simulation experience [3].

In debriefing, students are encouraged to describe how they felt during the simulation and provide feedback to one another [3]. Instructors guide students to understand and decrease the gap between their theoretical knowledge and practical skills while helping students to actively participate [4]. Simulation alone cannot induce learning; this only occurs effectively when debriefing has been provided through reflection and feedback, essential processes in developing professional competence [3].

Despite the importance of debriefing, it is difficult to debrief all the experiences of students within the limited time frame of simulation training; therefore, there is a need for research into ways to effectively provide students with reflection and feedback.

However, current research in simulation training is focused on the development and application of scenarios and the design and application of simulation training, and only a few studies on simulation training design have also provided suggestions on debriefing methods. In comparison to the importance of debriefing in students’ learning, studies on debriefing methods in simulation training and their effects are lacking.

Simulation training is a teaching method that improves students’ learning and judgment in clinical situations and helps students to reflect on their own experiences and learn new things by debriefing with colleagues. Moreover, simulation training is also known to improve students’ satisfaction with learning, confidence, critical thinking, and clinical performance [5]. As a way to evaluate such effects of simulation training, a clinical judgment rubric was developed.

The clinical judgment rubric was developed by developing the four steps in Tanner’s [6] clinical judgment model into 11 specific subdomains. It is being used widely as an evaluation tool for nursing simulation and for education and research purposes [5], [7].

This study aims to conduct simulation training with nursing students and evaluate the effects of debriefing using a clinical judgment rubric on simulation effectiveness, students’ knowledge, and job performance. Through the study, we aim to provide the empirical evidence needed to evaluate the effects of debriefing on the outcome of nursing simulation training.

2 Methods

2.1 Design of Study

The study was designed as a non-equivalent control group pretest-posttest study.
2.2 Participants of Study

Eighty-one fourth-year nursing students enrolled in an integrated simulation course at a university located in D city were assigned randomly, using a random sampling program, into an experimental group consisting of 41 students and a control group consisting of 40 students.

2.3 Study Tools

Knowledge. Based on the simulation scenario, five essay questions were used to evaluate students’ knowledge needed to care for patients with acute pain and neurocirculatory disorders. There was one evaluator, and each question was scored out of four, with the total score ranging between 0 and 20 and higher scores indicating higher levels of knowledge. The essay questions were reviewed for validity by one professor in adult nursing before use.

Skill Performance. The blood transfusion skills needed in the simulation scenario were evaluated based on the core nursing skill evaluation protocol developed by the Korean Accreditation Board of Nursing Education [8]. There were 28 elements to be performed in transfusion, and each element was scored out of 2. The total score ranged between 0 and 100, and higher scores indicated better skill performance.

Simulation Effectiveness. The simulation effectiveness scale provided by METI [9] was used in the present study. The tool consists of eight questions in learning and five questions in confidence that are marked out of three. The total scores range between 13 and 39, and higher scores indicate higher simulation effectiveness.

2.4 Data Collection

Before the beginning of the study, participants were informed about the purpose and procedure of the study as well as confidentiality, and we received written consent forms from all participants. One research assistant orally explained to participants how to fill out questionnaires, and questionnaires were distributed to participants before simulation and after debriefing and were completed by participants in their own handwriting. In order to organize the course schedules of the 81 participants enrolled in the integrated simulation course, the participants were divided randomly using a random sampling program into an experimental and a control group. The experimental group was debriefed using the clinical judgment rubric, and the control group was debriefed using ordinary debriefing methods. Pre-simulation data were collected before simulation training, and post-simulation data were collected after simulation training that reproduced two patient cases using a high-efficiency simulator and included debriefing; data were collected from March 2015 to June 2015.
2.5 Data Analysis

Collected data were analyzed using the SAS 9.2 program. Characteristics of participants were analyzed in real numbers and percentage, and differences between the experimental and control groups in terms of simulation effectiveness, participants’ knowledge, and skill performance were analyzed using paired t-test and t-test.

3  Result

3.1 General Characteristic of Study Participants

The age of participants ranged between 21 and 24 with a mean of 22.35; there was no statistically significant difference between the groups in terms of the distribution of ages.

Table 1. Characteristic of participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Categories</th>
<th>Experimental group (n = 41)</th>
<th>Control group (n = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n(%)</td>
<td>n(%)</td>
</tr>
<tr>
<td>Age (year)</td>
<td>21</td>
<td>20(48.8)</td>
<td>28(70.0)</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>13(31.7)</td>
<td>6(15.0)</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>4(9.7)</td>
<td>5(12.5)</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>4(9.7)</td>
<td>1(2.5)</td>
</tr>
</tbody>
</table>

3.2 Tests of Homogeneity between Experimental and Control Groups

Table 2 shows the results of tests of homogeneity for knowledge, skill performance, and simulation effectiveness between the experimental group, which was debriefed using the clinical judgment rubric, and the control group, which was debriefed using other debriefing methods. No statistically significant difference was observed, indicating that the groups were homogeneous.

Table 2. Homogeneity tests between the two groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental group</th>
<th>Control group</th>
<th>t(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M ± SD</td>
<td>M ± SD</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>12.18 ±2.36</td>
<td>10.85 ± 5.03</td>
<td>0.73(0.642)</td>
</tr>
<tr>
<td>Skill performance</td>
<td>69.20 ± 10.50</td>
<td>71.10 ± 9.60</td>
<td>0.56(0.574)</td>
</tr>
<tr>
<td>Simulation effectiveness</td>
<td>33.02 ± 3.29</td>
<td>32.03 ± 4.45</td>
<td>1.46(0.149)</td>
</tr>
</tbody>
</table>
### 3.3 Differences in Simulation Effectiveness, Students’ Knowledge, and Skill Performance between the Experimental and Control Groups

Table 3 shows the analysis of the difference in simulation effectiveness and students’ knowledge and skill performance between the experimental and control groups.

There was a statistically significant difference in students’ knowledge between the groups with the experimental group showing higher increase in knowledge ($F = 4.27$, $p = 0.042$). The experimental group showed a pre-simulation score of 13.18 and a post-simulation, post-debriefing score of 16.58, showing a significant within-group difference. Similarly, with the experimental group, the control group showed an increase from 10.85 pre-simulation to 16.17 post-simulation, which was also a statistically significant difference.

A statistically significant difference was also observed between the experimental and control groups in terms of their skill performance with the experimental group having a higher increase in job performance ($F = 5.88$, $p = 0.017$). The experimental group showed a statistically significant difference in job performance with a pre-simulation score of 69.2 and a post-simulation score of 82.0. Similarly, the control group showed a statistically significant difference within the group with a score of 71.1 before simulation and 77.4 after simulation.

Simulation effectiveness in the experimental and control groups was statistically different with higher effectiveness observed in the experimental group ($F = 22.66$, $p < .001$).

#### Table 3. Differences in knowledge, skill performance, and simulation effectiveness between the two groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Pre</th>
<th>Post</th>
<th>t(p)</th>
<th>t(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M ± SD</td>
<td>M ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>Expe.</td>
<td>12.18 ± 2.36</td>
<td>16.58 ± 1.17</td>
<td>8.79(&lt;.001)</td>
<td>4.27(0.042)</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>10.85 ± 5.03</td>
<td>16.17 ± 2.83</td>
<td>8.84(&lt;.001)</td>
<td></td>
</tr>
<tr>
<td>Skill performance</td>
<td>Expe.</td>
<td>69.20 ± 10.50</td>
<td>82.0 ± 8.83</td>
<td>5.45(&lt;.001)</td>
<td>5.88(0.017)</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>71.10 ± 9.60</td>
<td>77.4 ± 7.84</td>
<td>3.65(0.001)</td>
<td></td>
</tr>
<tr>
<td>Simulation effectiveness</td>
<td>Expe.</td>
<td>33.02 ± 3.29</td>
<td>34.05 ± 2.65</td>
<td>2.34(0.024)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>32.03 ± 4.45</td>
<td>32.40 ± 4.35</td>
<td>0.59(0.559)</td>
<td></td>
</tr>
</tbody>
</table>

#### References