Research Article

Impact of a Care Task Design Program on Novice Nursing Students’ Self-Reflection and Insight, Teamwork Skills, and Holistic Nursing Competency

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Abstract

AIM: The aims of this study were to evaluate the effects of a self-appraisal of clinical simulation care tasks in novice nursing students and assess their self-reflection and insight, teamwork skills, and holistic nursing competence in four different periods.

METHOD: A single group pre- and post-test design was conducted. Data were collected between September 2019 and February 2020. Nursing students who participated in the fundamental nursing laboratory courses in the second year of the nursing department at a medical university were invited to participate in the study. Data were collected at four time points using the Self-Reflection and Insight Scale, Holistic Nursing Competence Scale, and the Teamwork Skills Scale. A generalized estimating equation was used for all statistical analyses.

RESULTS: Across the four measurements, the score of self-reflection and insight ranged from 76.68 to 78.00, teamwork skills from 68.83 to 71.21, and holistic nursing competence from 134.48 to 146.46. Student performance was above average on all research variables. The results confirm the hypotheses that the program improves self-reflection and insight, teamwork skills, and holistic nursing competencies in nursing students.

CONCLUSION: These findings suggest that the program can be used to improve students’ self-reflection, and it may also help to enhance their teamwork skills and holistic nursing competence.

Keywords: Holistic nursing competence, insight, nursing student, self-reflection, teamwork skill

Introduction

Education is a complex system (Jacobson et al., 2019), and this especially applies to nursing education. In particular, as patient care becomes more complex, a comprehensive integrated approach to the examination will need to respond accordingly to protect patients’ health and safety with an adequately trained nursing workforce (Glasgow et al., 2019).

Schön (1987) stated that learning through reflection in action can be enabled and encouraged through coaching. Schön also identified three types of coaching, including “joint experimentation,” “follow me,” and the “hall of mirrors.” Joint experimentation is a process by which students and coaches work together by discussing their ideas and the reasons behind their actions as they proceed. This part is in line with the students’ learning in the school laboratory and they discuss with the teacher the advantages and disadvantages of the technology they implement. Follow me and hall of mirrors are in line with teachers guiding students in real clinical practice. Previous studies have successfully applied “knowing-in-action” and “reflection-in-action” in students’ learning programs and found improvements in students’ learning effectiveness (Hallett, 1997; Richardson & Maltby, 1995).

Empowerment, self-learning appraisal, knowing-in-action, and reflection-in-action are all vital teaching strategies. A previous study has shown that self-learning efficacy is an important learning foundation (Pai et al., 2018) and suggested that interventions are required for the improvement of nursing students’ self-learning ability and general self-efficacy (Chen et al., 2019; Oh & Yang, 2019). Mulli et al. (2022) also noted that some benefits of reflection-in-action included the promotion of collaborative learning, building confidence and critical thinking, and embedding reflection into practice.

In addition, teamwork, an important part of clinical work and patient care, is also important. Healthcare teams vary in structure and purpose, and most patient care depends on the ability of different professionals to coordinate their actions. Zaheer et al.’s work (2021) showed that the teamwork of healthcare professionals positively influenced patient safety. Anderson et al. (2021) also pointed out that interventional research on teamwork should first focus on its temporal and dynamic characteristics to understand how teamwork unfolds in sequence. Second, contextual influences, such as job tasks, should also be incorporated into the study design. This also showed that clinical simulation care tasks designed to promote students’ learning of healthcare teamwork are a vital requirement.

As stated in the literature review earlier, a comprehensive set of graduation metrics should include “actually learning the requisite knowledge, clinical reasoning skills, communication skills, and the necessary ethics/values to practice safely and persist
Research Questions

1. Does the CSCT-SA action program promote self-reflection and insight among nursing students?
2. Does the CSCT-SA action program improve the teamwork skills of nursing students?
3. Does the CSCT-SA action program promote holistic nursing competence in nursing students?

Method

Study Design

This was an analytic observational study with a quasi-experimental single-group pre-/post-test methodology. The Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) checklist was used to present the design and results of this study.

Participants

The participants were recruited from a medical university. Data were collected between September 2019 and February 2020. A total of 124 nursing students who participated in the fundamental nursing laboratory courses in the second year of the nursing department were invited to participate in the care task design program in this study. Within this group, 120 subjects agreed to answer the questionnaires at time 1 (pre-test) assessment, 118 at time 2 (post-test 1) assessment, 118 at time 3 (post-test 2) assessment, and 102 completed a questionnaire at time 4 (post-test 3). It was calculated the necessary sample size for repeated measures based on a previous finding concerning the “perceived working within a work-team” effect of a counseling training program in nursing staff (effect size = 0.29; Arranz et al., 2005) and used the G*Power 3.1 with \( \alpha = 0.05 \), power = 0.80, number of measurement = 4, and determined that 18 participants were needed. When the effect size to a small effect size of 0.15, the required sample size is 62 participants. In this study, there were 102 participants; thus, the sample size target was exceeded.

Data Collection Tools

Three scales were used to assess students’ learning effectiveness: self-reflection and insight, teamwork skills, and holistic nursing competence. All scales were used with the permission of the authors. The two items investigated the student’s age and gender respectively.

Self-Reflection and Insight Scale: Students’ self-reflection was measured utilizing the Chinese version of the Self-Reflection and Insight Scale (SRIS) (Chen et al., 2016). The original scale was developed by Grant et al. (2002) and measures students’ thinking, feelings, and behaviors. Three areas of SRIS were assessed: engaging in self-reflection (six items), need for self-reflection (six items), and insight (eight items). Responses to every item had to be rated on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a higher level of self-reflection and insight. The total score ranged from 20 to 100 points. The internal consistency of the SRIS was good (Cronbach’s alpha = 0.89).

Data Collection

The CSCT-SA action program is an education program for nursing students which was created based on a literature review of the share–start teaching approach, Habermas’ critical theory, and systems thinking (Pai et al., 2020). This training program integrates the need for nursing core competencies and a strategy of reflective practice and coaching to provide teaching interventions for nursing students with the aim of promoting students’ nursing competence. The program was framed in a two credits compulsory course (Fundamental Nursing Laboratory). It lasted a total of 10 hours over 3 weeks and was administered to small groups with a maximum of 3–4 participants in each group. There were a total of 26 groups. This program incorporated an active teaching and participatory methodology, including role-playing of care task sessions and workshop discussions. Four processes were identified as follows.

1. During the initial session, in week 1 of the semester, the researcher explained the course and program introduction to all students and invited participants to fill in the questionnaire in the fourth week as a pre-test for the research measurement indicators (first measurement).
2. In weeks 4–10 of the semester, nursing teachers demonstrate basic nursing skills (for example) for 2 hours a week, and the students practiced these skills in the Situational Skills Centre for 2 hours. Weeks 10–12 included the main modules of the program. First, students chose topics that they considered most difficult, performed technical exercises and recorded videos, and then discussed them with the clinical teacher. The direct discussion followed previous research guidelines (Pai et al., 2020; p. 3): (a) asking about the effectiveness of care task execution, (b) pointing out shortcomings or errors in task execution, (c) determining whether the care task was executed in the planned way or whether there was a gap between the two, and (d) asking how to perform the task operation to obtain better outcomes. Subsequently, the second research measurement indicators were completed by the students.
3. In week 15 of the semester, the student completed the skills test and filled out the third questionnaire.
4. In week 20 of the semester, the student entered a real hospital for the clinical practicum and completed the fourth questionnaire.

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Teamwork Skills Scale: Students’ perceived teamwork skills were measured using the Teamwork Skills Scale (TSS) (Blomstrom, 2010), which contains 17 items. Responses to every item had to be rated on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating a higher level of teamwork skill. The total score ranged from 27 to 185 points. The internal consistency of the TSS was good (Cronbach’s alpha = 0.91).

Holistic Nursing Competence Scale: Students’ perceived nursing care ability was measured using the Holistic Nursing Competence Scale (HNCS) (Takase & Teraoka, 2011), which has been translated into a Chinese version and has good validity and reliability (Eng & Pai, 2015). Four areas of HNCS were assessed: general aptitude (7 items), ethically oriented practice (9 items), nursing care in a team (7 items), and professional development (4 items). Responses to every item had to be rated on a Likert scale ranging from 1 (not at all) to 7 (always), with higher scores indicating a higher level of nursing care competence. The total score ranged from 27 to 189 points. The internal consistency of the HNCS was good (Cronbach’s alpha = 0.98).

Statistical Analysis
Descriptive analyses were performed for demographic variables and for every variable in the pre-test, post-test 1, post-test 2, and post-test 3. To compare the patterns of self-reflection, teamwork skills, and nursing competence among nursing students in the four assessment moments, a generalized estimating equation (GEE) was used. The Statistical Package for Social Sciences, version 22.0 software (IBM Corp., Armonk, NY, USA) was used. The p-values lower than .05 were considered statistically significant.

Ethical Considerations
All research procedures were approved by the Institutional Review Board of Chung Shan Medical University Hospital (CSMUH No: CS2-19071). At the beginning of the semester, the investigator explained the purpose of the study and informed students that they could withdraw from the study at any time without penalty. The researchers also explained that students’ participation or non-participation did not affect their semester test scores, and finally, students who agreed to participate signed a consent form. Participants were asked to complete a questionnaire which took approximately 20 minutes. For the four assessment periods (pre-test, and post-tests 1, 2, and 3), the students were assessed with the same questionnaire, enabling us to compare the scores in the four periods.

Results
The participants (n=102) were largely composed of females (83.3%), with an average age of 20.56. Other descriptive data for the research variables in the four moments are presented in Table 1. The score of self-reflection and insight ranged from 76.68 to 78.00, teamwork skills from 68.83 to 71.21, and holistic nursing competence from 134.48 to 146.46. The student performance was above average on all research variables. The GEE was performed to compare the level of teamwork skills, nursing competence, and self-reflection in the four assessment moments, and the data are presented in Table 1. To understand the pattern of every research variable at four different time points, the data was presented in Figure 1.

Self-reflection and Insight
Very different patterns were observed over the four time points for self-reflection and insight, as shown in Table 1 and Figure 1. It can be observed that the mean value in the pre-test (time 1) assessment decreased at time 2 and time 3. However, at time 4, the mean increased and was higher than that at the pre-test (time 1). The GEE analysis showed that there were no significant differences between the four assessment points (Table 1).

Teamwork Skills
As shown in Table 1 and Figure 1, the mean values in the pre-test assessment of teamwork skills gradually increased in the three post-tests (times 2, 3, and 4). The GEE analysis shows that there were significant differences between the fourth time test and time 1 (β = −2.370), time 2 (β = −1.97), and time 3 (β = −1.78).

Holistic Nursing Competence
Finally, it was also observed that mean values in the pre-test (time 1) assessment of nursing competence gradually increased in the three post-tests (times 2, 3, and 4; Table 1 and

Table 1.
Compare Changes and Trends of Measured Variables Over Time With Generalized Estimating Equation (GEE) Analysis (N=102)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Self-Reflection and Insight</th>
<th>Teamwork Skills</th>
<th>Holistic Nursing Competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1</td>
<td>M (SD)</td>
<td>β</td>
<td>SE</td>
</tr>
<tr>
<td>Time 1</td>
<td>77.28</td>
<td>−0.72</td>
<td>0.78</td>
</tr>
<tr>
<td>Time 2</td>
<td>76.68</td>
<td>−2.37</td>
<td>0.79</td>
</tr>
<tr>
<td>Time 3</td>
<td>76.90</td>
<td>−3.27</td>
<td>0.76</td>
</tr>
<tr>
<td>Time 4</td>
<td>78.00</td>
<td>0.020</td>
<td>0.76</td>
</tr>
</tbody>
</table>

Note: CI = confidence interval; SE = standard error; Time 1 = pre-test (baseline); Time 2 = post-test 1; Time 3 = post-test 2; Time 4 = post-test 3.

0° = reference value (Time 4), as compared to Time 1 or Time 2 or Time 3.
The GEE analysis shows that there were significant differences between the fourth test and time 1 ($\beta = -11.98$), time 2 ($\beta = -8.68$), and time 3 ($\beta = -7.62$).

**Discussion**

The main effect it was expected to achieve with this CSCT-SA program was to promote students’ self-reflection and insight, teamwork skills, and holistic nursing competence. Aside from this, it was expected these skills to be maintained and to improve following a real clinical practice. At this point, it will be discussed discuss the effects of this program according to the data analysis.

It was observed very different patterns in self-reflection and insight in that a decreasing and an increasing trend were observed. Students reported lower self-reflection and insight at time 2 after CSCT-SA than before the training program. However, when they were assessed at time 3 and time 4, their perceived self-reflection gradually improved, and at time 4, it was even greater than before the program. What is the explanation for this trend? These results may have occurred because students have previously consciously considered that their own self-reflection and insight abilities were sufficient, but through a series of skill exercises and teacher-led discussions, they discovered that their self-reflection was insufficient. However, as the program continued, students’ self-reflection gradually improved, especially in the fourth time when they came into contact with real clinical practice, and their scores exceeded the first measurement. These findings are consistent with previous research that indicated that an individual’s self-reflection is initially slightly reduced via CSCT-SA (Pai et al., 2020); however, as the program continues and students progress to real clinical practice, their self-reflection ability is enhanced more.
It was expected that these skills would be maintained and improved and continue until they entered real clinical practice. These results echo those of Schön (1987), who indicated that learning through reflection in action can be enabled and encouraged through coaching. It also accords with a previous study that reported that students showed higher levels of reflectivity after the use of reflective diaries during a period of community health care practice.

It was observed an increase in teamwork skills and holistic nursing competencies after the program. In addition, these abilities were even greater at weeks 15 and 20. It is interesting to note a significant difference between the third and fourth scores. This also shows that the score of the fourth time in teamwork and nursing competencies was the highest among all time points. This shows that our program promotes the improvement of student teamwork skills and nursing abilities, and these abilities increased even more after real clinical practice. These outcomes confirm the effectiveness of our program and highlight the importance of clinical practice. Our findings also confirmed the findings of Mulli et al. (2022), who indicated that the learning of reflection-in-action could promote collaborative learning.

It is worth noting that students reported that the top three items at time 4 in the 17 questions on teamwork skills were to “complete tasks assigned in the team in a timely fashion,” “appreciate diverse perspectives of team members,” and “recognize that individual differences can improve the team’s outcome.” These findings explain the students’ responsibility for the nursing task and the acceptance of the diverse views of the team. This is in line with the goal of nurturing students’ accountability in clinical practice (Chin, 2010). At the same time, students can accept the diverse views of the team and reflect on their own about whether the care task has integrity. Our findings accord with those of Gartrell and White (2021) who state that “we can learn by analyzing and reflecting on our errors, by building safer processes, improving our knowledge and increasing our vigilance” (p. 1). On the other hand, the lowest scores at time 4 were to “manage and resolve team conflicts effectively,” “identify and manage misunderstandings,” and “identify important issues or problems in a team.” These findings show that students’ integration and negotiation abilities in the face of different opinions need to be improved. Therefore, it was suggested that future program designs can increase the training in negotiation and integration ability to enhance students’ ability to resolve team conflicts.

Additionally, students reported on the four dimensions of holistic nursing competencies. The two dimensions with the highest score growth from time 1 to time 4 were “ethically oriented practice” (mean difference = 4.48, p < 0.001) and “nursing care in a team” (mean difference = 4.06, p < 0.001). These results are in line with our expectations and can improve students’ abilities in professional care and ethical practice. This finding seems consistent with previous research by Takase and Teraoaka (2011), who used the same scale to survey Japanese registered nurses’ holistic nursing competencies, and also found that the two dimensions (ethically oriented practice and nursing care in a team) had the highest average score compared to other dimensions. It also confirms the clinical importance of the two abilities of ethically oriented practice and nursing care in a team. Our findings are also consistent with those of Palesy and Levett-Jones (2020), who reported that reflective activities change students’ clinical practice, career progression, and increase their confidence.

Overall, our study confirmed the effectiveness of integrating the CSCT-SA program into the teaching of the two credits compulsory course (Fundamental Nursing Laboratory), and its benefits can be extended to real-life clinical practice.

**Study Limitations**

We would like to mention the limitations of this research. The sample was recruited from a medical university and lacked a control group, limiting the broad applicability of our conclusions. An enlarged and multiple-group sample is recommended. If the sample can include a control group, it will increase the generalizability of the program.

**Conclusion and Recommendations**

According to the results, it can be affirmed that a CSCT-SA program can be effective in promoting students’ self-reflection and insight, teamwork skills, and holistic nursing competence. Hypotheses 2 and 3 were confirmed by the results obtained at the follow-up over four different periods. Overall, this study highlights the importance of students’ self-reflection and insight through the experience of knowing in action and reflection in action. This can further enhance their teamwork skills and holistic nursing competencies.

**Ethics Committee Approval:** The action research was approved by the Institutional Review Board at Chung Shan Medical University Hospital (approval number: CS2-19071).

**Informed Consent:** Written informed consent was obtained from all participants who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – H-C.P.; Design – H-C.P.; Supervision – H-C.P.; Funding – H-C.P.; Materials – H-C.P.; Data Collection and/or Processing – H-C.P., H-M.C., Y-C.L.; Analysis and/or Interpretation – H-C.P.; Literature Review – H-C.P., H-M.C., Y-C.L.; Writing – H-C.P.; Critical Review – H-C.P., H-M.C.

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