Effect of online case-based learning on nursing students’ self-confidence amid COVID-19 pandemic

Totok Harjanto*, Made Satya Nugraha Gautama², Dimas Sumunar³

ABSTRACT

Introduction: Amid the COVID-19 pandemic, nursing educational programs have shifted from physical to online learning. Both academic and clinical learning. Case-based learning is one of the clinical learning methods which is adapted to current circumstances. The learning method connects theoretical knowledge and practical experiences on nursing students’ clinical environment. This study aimed to evaluate the effect of online case-based learning on the clinical nursing students’ self-confidence.

Methods: Forty-five clinical nursing students participated in this quasi-experimental study with one group pre-post-test design. The students’ self-confidence was evaluated using an instrument consisting of 15 Likert-scale items with cognitive, affective, and psychomotor subscales. The students’ self-confidence was measured before and after the online case-based learning (O-CBL) activities. The activities included case presentation, individual case analysis, small group discussion, and problem-solving practice for students.

Results: This study successfully organized the O-CBL method to enhance the students’ self-confidence. The average self-confidence level of the students increased from 57.84 to 60.62. Paired t-test analysis yielded p=0.006 (p <0.05), which indicated a significant effect of O-CBL on the students’ self-confidence. Significant findings were also discovered from the cognitive (p=0.01) and psychomotor (p=0.004) domains. The students’ affective domain did not significantly improve (p=0.089, p>0.05).

Conclusion: O-CBL increases nursing students’ self-confidence specifically in cognitive and psychomotor aspects.

Keywords: nursing student, online case-based learning, self-confidence.


INTRODUCTION

Among low-middle income countries, COVID-19 remains a challenge for community health.¹ Indonesia has been reported as the emerging COVID-19 hotspot in Asia with 4.71 million infections and increased daily active cases.² As a consequence, restrictions on community movements are in place. The public health authority has mandated universities to substitute offline teaching and learning activities into online or distance learning.³ Measures have taken to reduce the spread of the COVID-19 virus in the educational setting, including hospital-based clinical learning for medical and health professions students.⁴,⁵ The COVID-19 pandemic requires universities to transform face-to-face teaching and learning to online or remote study. Clinical learning is a fundamental aspect of a learning process in preparing professional and competent nurses in the future.⁶ Clinical learning is a process in connecting students’ theoretical knowledge to practical experience based on actual nursing care in hospitals and the community.⁷ The transition poses challenges for nursing students in dealing with clinical problems. Improvements of students’ motivation, sense of responsibility, experience, and self-confidence are necessary.⁸ Self-confidence is considered as the main component in mastering nursing competency.⁹ A study reported that 90.5% of nursing students lack of confidence in dealing with clinical situations and patient care management.¹⁰ Distance learning is the ultimate option for higher education to continue students’ learning activities amid the COVID-19 pandemic.¹¹ Online learning has been reported to be effective and dynamic for the delivery of learning materials.¹² Educational institutions apply various online modalities to provide their students with novel experiences and to maintain their competency.¹³ Lack of clinical competence affects students’ preparedness for professional career and leads to inability of fulfilling stakeholders’ demands.¹⁴ Therefore, an efficient learning method is essential to integrate theoretical knowledge with practical experience in improving nursing students’ competence.

Case-based learning (CBL) is one of the widely applied methods in student-centered learning (SCL).¹⁴,¹⁵ Case-based learning has become a part of medical and nursing education programs in around the world and deemed as an effective teaching and learning method.¹⁶ The learning method encourages students to actively explore their knowledge. The CBL learning method includes a clinical discussion or
tutorial under the supervision of a clinical tutor or facilitator. The effectiveness of CBL in delivering a wide range of learning materials in a relatively short period of time has been proven. CBL method applied in this study facilitated a nursing clinical learning process in a distance learning setting (online case-based learning/O-CBL).

Amid COVID-19 pandemic, nursing education institutions were expected to properly address rapid changes of teaching-learning modalities. Adapting to the restrictions in favor of satisfying learners’ needs was challenging. Institutions were implementing various approaches to tailor the needs of students in parallel with optimizing the learning opportunity. This study aimed to identify the effect of O-CBL on nursing students’ self-confidence.

**METHODS**

**Study Design**

A quasi-experimental quantitative study with one group pre-post-test design took place between October-November 2020 at the School of Nursing, Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada (PSIK FK-KMK UGM). Forty-five nursing students participated in this study. The study evaluated the nursing students’ self-confidence in dealing with clinical learning experiences. The self-confidence was measured with an instrument which was adapted and modified from the Student Satisfaction and Self-Confidence in Learning (SCLS). The instrument which was adapted and modified by Gautama et al focused on self-confidence with eight statements into cognitive, affective, and psychomotor subscales. The validity and reliability of this instrument had been verified by V value of 15 items>0.6 and Cronbach Alpha=0.782>0.7. The study was approved by the Medical and Health Research Ethics Committee of FK-KMK UGM with Reference Number KE/FF/0976/EC/2020.

**Data Collection**

Study participants at their first semester of clinical study were recruited through a popular chatting platform. Prior to participating in this study, the students received audio recordings and text explanations about the study process. Following the explanation, the students were asked to sign an informed consent. The student participants completed a self-confidence evaluation in a web-based questionnaire. During the clinical learning, the students were divided into fifteen groups. The number of groups considering students-supervisor ratio, institutional policy and patient availability. Each group was supervised by an academic or clinical facilitator which was responsible for introducing the discussion topic, learning objectives, and study. The first meeting between the students and facilitator was carried out one week before the scheduled discussion.

The online-CBL method was implemented in four stages. The first and second sessions of O-CBL were organized asynchronously, while the third and fourth sessions were carried out synchronously using an online video conference software. The first session of the O-CBL was a case presentation. The university learning management system (LMS) was used for the case discussions between the students and facilitators. The facilitators described a non-fictional patient case for discussion. The students were expected to learn about the patient and the disease independently. At the second session, a case analysis was carried out by each of the students. The students assessed the case by reading the materials and supporting articles. The facilitator evaluated the references listed by the students for the discussion at this session.

Session 3 and 4 required the students and facilitators engage in a live discussion. During the session, the facilitators are entitled to direct the forum in accordance with the expected learning objectives. The facilitators were also responsible for nurturing interactions among the students, providing suggestions for any difficulties, giving appropriate responses, and evaluating the students’ arguments according to evidence-based findings. Since the students completed their case analysis at early sessions, their study results were discussed, compared, and analyzed in this group activity. The facilitators encouraged the students to make nursing diagnoses and prepare for nursing care plans by considering the patient’s history. The final session of the O-CBL was dedicated to delivering feedback to the students’ nursing care plans.

**Statistical Analysis**

Data were analyzed statistically by using the SPSS computer program. The results were presented as mean ± standard deviation (SD). When p-value less
than 0.05 was indicated any significant differences.

**RESULTS**

A total of 5 male and 40 female nursing students participated in this study. The students’ characteristics are presented in Table 1.

This study measured the nursing students’ self-confidence before and after intervention using the O-CBL method. In terms of the students’ self-confidence, the average post test score was 60.62 (SD=6.59). Compared to the pretest score, the average post test score was greater by 2.8. Several students achieved the maximum score for the post-test.

In general, the O-CBL methods increased the students’ self-confidence. The study results were then analyzed using the Bloom’s Taxonomy in terms of the cognitive, affective, and psychomotor aspects. The result of the study indicated that the students’ psychomotor aspect significantly improved by 1.25 differences. The margins for the cognitive and affective domains were 0.93 and 0.58, respectively (see Table 3).

In this study, the students’ self-confidence, cognitive, and psychomotor domains significantly improved. A paired t test statistical analysis indicated significance value of the self-confidence by 0.006 (p<0.05). Similar findings were reported for the cognitive (p=0.01) and psychomotor domains (p=0.000) with p<0.05. The results indicated that the implementation of the O-CBL method was effective to enhance the students’ self-confidence, cognitive level, and psychomotor skills. However, in terms of the affective domain, there was not any significant effect (p>0.05).

A further analysis of the effectiveness of the O-CBL method was done in this study. The effect size was calculated using Cohen’s D. The average pre-test and post-test difference was divided with standard deviation, resulting in d=0.43 for the effect size. Based on this calculation, the O-CBL method was categorized as having a moderate effect.

**DISCUSSION**

Online case-based learning (CBL) is a form of learning method transformation to facilitate nursing students in solving actual cases during the clinical practice. This study discovered that O-CBL increased the nursing students’ self-confidence (p=0.006, 95% CI: 0.82 – 4.735; t=2.86, d=0.43). It was also confirmed that the O-CBL generated a significant impact on the cognitive aspect (p=0.01; 95% CI: 0.239 – 1.627; t=2.71), and the psychomotor aspect (p=0.004, 95% CI: 0.411 – 2.078, t=3.01) of the self-confidence subscale. A positive association was also reported in a study by Blanco et al which also aimed to maintain nursing students’ self-confidence and self-efficacy amid the COVID-19 pandemic.

Online learning promotes students’ efficacy and self-confidence which ultimately improve students’ academic performance. The O-CBL is a student-centered learning method designed to enhance students’ problem solving and critical thinking skills. CBL is widely known as case-based reasoning which combines students’ experiences and theoretical thinking skills. Study findings reveal that self-efficacy and confidence are important factors for students in performing a particular clinical procedure. It is essential for educators and students to take advantage of the online platforms in enhancing efficacy for higher quality learning. CBL requires behavioral, emotional, and cognitive skills as well as engagement to build comprehensive understanding of theoretical concepts which are fundamental for students in developing skills and performance. The effectiveness of the method in increasing learning motivation has been validated.

**Table 1.** Characteristics of nursing students in online case-based learning (n=45).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>Mean</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>11.1</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>88.9</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>22.2</td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.00-2.74 (Satisfactory)</td>
<td>1</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>2.75-3.50 (Excellent)</td>
<td>11</td>
<td>24.4</td>
<td></td>
</tr>
<tr>
<td>3.51-4.00 (Cum Laude)</td>
<td>33</td>
<td>73.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2.** Average nursing students’ self-confidence score before and after O-CBL (n=45).

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>39</td>
<td>71</td>
</tr>
</tbody>
</table>

**Table 3.** Nursing Students’ Cognitive, Affective, and Psychomotor Subscale (n=45).

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Cognitive</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>Affective</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Psychomotor</td>
<td>13</td>
<td>23</td>
</tr>
</tbody>
</table>

**Table 4.** The effect of the O-CBL method on nursing students’ self-confidence.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M±SD</th>
<th>t</th>
<th>df</th>
<th>Sig (2-tailed).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-confidence</td>
<td>2.78±6.52</td>
<td>2.86</td>
<td>44</td>
<td>0.006*</td>
</tr>
<tr>
<td>Subscale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive</td>
<td>0.93±2.31</td>
<td>2.71</td>
<td>44</td>
<td>0.01</td>
</tr>
<tr>
<td>Affective</td>
<td>0.58±2.23</td>
<td>1.74</td>
<td>44</td>
<td>0.09</td>
</tr>
<tr>
<td>Psychomotor</td>
<td>1.24±2.77</td>
<td>3.01</td>
<td>44</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*p<0.05
The group discussion organized in O-CBL offers flexibility for students to express their opinions, in-depth analysis, and build interactions with educators and peers. A study suggested that students' active involvement in learning determines the overall performance. In this sense, course directors are obliged to provide clear instructions for facilitators in nurturing students' engagement in case-based learning. Applying O-CBL as an effective pedagogical tool requires direct linkage between learning objectives and learning materials during clinical practices to ensure the effectiveness of the method.

A similar study by Malureanu et al which utilized e-learning platforms reported improved students' self-confidence (p<0.001). In clinical learning, nursing students indicated high self-confidence after receiving educational contents through e-learning. Confident learners are willing to face challenges, be committed to leveraging clinical skills, and tackle complex tasks.

Promoting students' self-confidence during a clinical practice requires supportive a learning environment and appropriate educational system. Educators are responsible for increasing students' self-confidence by creating rich and constructive learning experiences. Early identification of students with lack of self-confidence is crucial to develop tailored teaching practices. Future directives of self-confidence are associated with clinical skill mastery and consistent self-improvements. In terms of communication skills, interactions with patients, and ability to appropriately respond to the ongoing circumstances, self-confidence plays a crucial role to help students behave effectively.

This study discovered that upon the completion of the O-CBL sessions, the students' affective domain did not significantly improve. The affective domain was represented by the students' behaviors, reflecting awareness, interest, attention, responsibility, listening ability, and response to the stimulus from other people. Behaviors are subject to existing values, attitudes, and customs from the surrounding environments. In an educational setting, affective domain involves students' engagement and their response to the media. Therefore, well-designed learning activities and proper delivery of learning materials are prerequisites to satisfy students' emotional experiences.

A significant improvement of the cognitive domain was observed in this study. The O-CBL method successfully delivered the learning materials for the students. Role of facilitators, supportive environments, reliable sources of teaching contents, clear instructions, and suitable evaluation are among essential elements to create meaningful learning. Similar findings by Amouzeshi et al confirmed that the combination of online learning and case discussion enhanced students' cognitive level.

The students' psychomotor skills significantly improved in this study, facilitated through the problem-solving exercises. Clinical cases provided in the learning sessions combined the students' theoretical knowledge and practical experiences from the healthcare facility. Experiential learning actively engages students in the learning process, thus delivering more meaningful understanding of professional practice in real situations. Focusing on the link between theory and practice in inquiry-based learning promotes the achievement of learning outcomes.

Addressing students' psychomotor development requires facilitators offer diverse learning materials from low-cost resources such as handouts and videos to high fidelity simulations, virtual or augmented reality for examples. Medium fidelity of learning resources in the form of a video simulation is considered sufficient to enhance students' clinical skills. The visual representation from the video helps students be familiar with clinical environment, mitigate fears, and improve clinical competencies for the future placements.

This research has been successfully evaluating the effect of O-CBL on nursing students’ self-confidence. However, this research was limited to measuring a student's confidence level based on three subscales. The original version of the instruments included more variables to be assessed. Future study needs to elaborate more on the whole self-confidence questionnaire with a bigger sample size and involve nursing institutions with enhanced generalizability.

CONCLUSION

Online case-based learning effectively serves as an alternative method in clinical education amid a pandemic. Students are facilitated to connect theoretical knowledge and practical experiences during online learning. O-CBL enhanced the nursing students' level of confidence specifically in terms of cognitive and psychomotor aspects. However, the students' affective domain of self-confidence did not significantly improve due to lack of engagement in case discussions. Development of online case-based learning has potential to enhance nursing student's self-confidence. Additional efforts are required to better address the affective domain by increasing students’ and facilitators’ awareness, interest, responsibility, active listening skills, response, and interactions. Further research with a different study design and a larger sample size is needed, as well as a more in-depth analysis to determine the factors that affect the effect of online case-based learning on nursing students' self-confidence amid COVID-19 pandemic.

CONFLICT OF INTEREST

The author declared no conflict of interest associated with this research.

FUNDING

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ETHICAL CONSIDERATION

This research has been approved by the Medical and Health Research Ethics Committee Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada.

AUTHOR CONTRIBUTION

Authors in this study contributed equally in the research execution and manuscript writing. Totok Harjanto is responsible for managing the research project and
establishing the framework for the manuscript.

Satya Noughra Gautama organized the research activities and developed the manuscript.

Dimas S.E.W. Sumunar developed the manuscript specifically in statistical data analysis.

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ORIGINAL ARTICLE