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Differences in The Effects of Core Nursing Skills Education According to the Use of Peer-Assisted Learning (PAL) Among Nursing Students

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ABSTRACT

This study aimed to develop a peer-assisted learning (PAL) program for use in a core nursing skills education course and to investigate the effects of the education program on three key outcomes. A comparative study was conducted through the division of students of a core nursing skills education program into a treatment group and control group. After the programs, self-efficacy, confidence and satisfaction were compared between the groups. The comparison of these three factors indicated that the related scores were significantly higher in the treatment group receiving the education program with the PAL method than those of the control group receiving traditional education. We concluded that self-efficacy gave the nursing students the confidence that they could successfully perform their tasks and motivation to learn. Education programs using the PAL method are suggested as an effective method for the acquisition of skills among nursing students.

Key words: *Self-efficacy, Confidence, Nurse, Learning, Nursing Education, Peer-Assisted Learning (PAL), OSCE.*

1. NECESSITY OF THIS STUDY

In recent years, the health care environment has been changing quickly due to the aging population, changes in disease patterns, advances in medical knowledge and skills, an enhanced sense of patient rights, and shortened length of hospital stays. As key nursing service providers [1], nurses require a high level of practical nursing competency, including specialized clinical knowledge and skills. Nurses who have recently graduated from a nursing college will need to acquire the expertise and skills required in clinical nursing practice. In particular, they need to be trained in nursing skills that have high performance frequency and importance in clinical practice.

In order to cope appropriately with such environmental changes, nursing education institutions should provide an effective and efficient education—in both theory and practice—to integrate students into nursing practice. Education in nursing practice is divisible into basic nursing practice and clinical practice. Education in basic nursing practice refers to the acquisition of the basic nursing skills and knowledge required for nurses to provide nursing care in clinical settings where complicated and complex situations occur. Education in the core basic skills should be conducted effectively as a priority.

For the core basic skills of nursing practice, which serves as the foundation for professional nursing practice, the Korean Accreditation Board of Nursing Education (KABONE) [1] has identified 20 core basic nursing skills that must be learned and mastered in the nursing curriculum due to their high performance frequency and importance in nursing care; this is reflected in the accreditation of nursing education [2].

Currently, education in basic nursing practice is conducted in labs at universities, and it is difficult for nursing students to master nursing skills from such an education alone. Consequently, when they enter the clinical field, they may often experience difficulties in recalling their professional knowledge and skills [3]. To solve this problem, a wide variety of methods are being introduced, including curriculum integration, simulation-based learning, integrated learning, and the resetting of educational objectives, with the intention of enhancing the effects of their education [4].

In medical education, peer-assisted learning (PAL) for undergraduate courses has emerged as the most suitable method for training and continuous supervision in the area of clinical education and is becoming a general teaching and learning method [5]. PAL can be defined as acquiring knowledge and skills through the active help and support of matched peers or

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partners. It involves individuals from similar social groups, but not professional teachers, helping each other to learn [6].

Because the PAL concept has evolved in different ways in different areas of education—in elementary school and middle schools, business schools, catering, law, science, and medicine—the term is also very diverse [7]. PAL entails learning from or with someone who has a similar level, background, or characteristic, rather than from an expert or professor. Tutors may be peer students in the same grade as the learners or else senior students [8].

PAL is not just a method of teaching and learning. It also involves students acting as facilitators, creating a new culture and sharing the burden of learning between them [9].

PAL program for learners, tutors, and colleges include the advantages in the various fields.

Because PAL is a comfortable and informal approach, interactions between learners and tutors are less threatening and more supportive. Peer tutors can understand peer students' problems, provide role modeling, and enhance learning motivation for the tutored students better than professors can. For colleges, the PAL program can permit cost reductions by the efficient use of resources and foster a learning culture that is collaborative, not competitive [7].

In clinical education, a number of studies have been conducted to demonstrate the effects of PAL, and further studies are being conducted to examine whether the PAL method needs to be introduced into more curricula. PAL is a broad concept in modern medical education and has almost no potential drawbacks while offering many advantages and benefits. PAL is an integral part of medical education, and thanks to the advantages it provides, will not lose this status [10]. PAL has been recommended as a way to improve students' communication skills, increase learning motivation, provide role models for junior students, and reduce teaching staff's education burden [8].

The results of a previous study regarding the PAL program at the higher education level indicated that students who received additional tutoring from their peers had better academic performance than a control group, that tutoring by those of the same age had the same effect as tutoring by those of another age, and that providing specific education to teachers as students showed improved outcomes for learners and better results for the mindset and self-image of both tutors and learners [11]. A study by Soriano reported that about 25% of U.S. medical schools offered PAL programs to their students and used their students mainly as tutors, small group facilitators, or teaching assistants for mentoring programs [12]. Interestingly, some studies have shown that students taught by student-teachers using correct teaching methods or formats performed better in Objective Structured Clinical Examination (OSCE) and that they could maintain a certain level of expertise in carrying out the learned skills for a maximum of six months. [13], [14]

When students were actively involved in nursing care with self-efficacy, they achieved a greater number of the desirable learning effects and improved nursing skills [15]. Self-efficacy is closely related to academic achievement—which induces challenges and efforts for new learning tasks—leads to self-directed learning and improves the performance and achievement of given tasks [16]. Self-efficacy gradually increases through repeated successful experiences and prior vicarious experiences [17]. It is considered that role modeling, repetitive learning, and self-directed learning can be provided as a collaborative learning culture through PAL programs.

Learning satisfaction is a state of mind that is attained when a goal in learning is achieved or when individual learners' expectations are met [18]. High-class satisfaction, positive learning attitudes, and motivations are considered essential factors for improving critical thinking [19].

The traditional learning methods are considered to be lacking in their capacity to stimulate critical thinking and may lead to self-study of knowledge and skills by students who require the integration of theories and practice, including nursing competency, after graduation [19].

Away from the traditional one-way teaching methods in universities, efforts should be made to encourage students to learn actively, with the confidence that they can perform their own tasks successfully. They can thereby gradually improve their nursing competency, including their core nursing skills.

In order to cope with the rapidly changing healthcare environment, the nursing competency of nurses is critical. Therefore, we attempted to develop an educational program that uses a new method to foster nursing students' core basic nursing skills.

This study aimed to investigate the effects—in terms of core nursing skills performance, self-efficacy, performance confidence, and satisfaction—of using a PAL approach to education for nursing college students in relation to learning about the "enema" program of core nursing skills, comparing the results with those of a control group receiving the traditional education.

2. METHODS

2.1 Study design

This quasi-experimental study used a nonequivalent control group with a time-lag design.

2.2 Participants

The participants of this study were fourth-year nursing college students who had undergone basic nursing practice at a nursing college located in D city, South Korea. All participants agreed to participate in this study after the purpose and procedure of this study were explained to them.

2.3 PAL development and application procedure

Creation of "enema" educational materials and teaching plans, and development of assessment tools	Focus group interview Expert panel
	Created teaching plans using OSCE/Clinical Performance Examination (CPX) tools
	OSCE assessment tools for enema, self-efficacy, performance confidence, satisfaction
Selection of tutors	- Selection of students with high academic grades, leadership, and motivation to participate as the priority - Final selection after interviews
Education for tutors	Professor provided an educational session for tutors in a meeting room
Learning plans	Announce detailed learning plans at the first orientation session - Week 1: theoretical lecture, education about enema, a survey of participants' prior knowledge - Week 2: Additional education, self-study. core skill assessment, post-test evaluation, self-study in a lab for 1 hour every day for 5 days - Notes · Requirement to keep time strictly · Preparation materials · Clothing · Participants return home after attendance/absence is checked **<u>Week 1</u>** - The professor(s) instructed the tutors to identify the students' prior knowledge about the enema. Tutors confirmed students' prior knowledge of core basic nursing skills according to the professor's instruction. - Pre-survey: Self-efficacy, performance confidence, and learning satisfaction were examined. - After explaining about the necessity and purpose of an education program using PAL, preliminary education was provided about the participants' roles related to the program's progress. - Information on learning and assessment using the clinical performance assessment tool was provided, as was advice about surveys and procedures. - The trained student tutors conducted the education program using the PAL method for students. - The lab was opened. Participants were divided into groups of five and instructed to self-study in the lab for one hour per day for five days. **<u>Week 2</u>** - Tutors provided the second education session and feedback for students - Additional self-study conducted for 1 hour every day in the lab - The core nursing skills performance of OSCE enema were assessed - Effects compared of the education received by PAL method group and the conventional method group - Post-survey: self-efficacy, performance confidence, and learning satisfaction were surveyed

2.4 Study Tools

- Enema–specific OSCE performance: Enema–specific OSCE assessment tools (29 items).

-Self-efficacy: Measured using a modified and supplemented tool based on the Self-Efficacy Scale developed by Park (2006) [20]. The tool consisted of 10 items in total, measured on a 10-point scale. A higher score indicates higher self-efficacy. In the study by Park, the scale produced a Cronbach's alpha of 0.93 for reliability; for this study, the Cronbach's alpha was 0.81.

- Performance confidence: Confidence in nursing performance was self-rated after performance using a tool developed by Park [21]. This tool consisted of 16 items in total. Each item was rated on a 4-point Likert scale, ranging from 1 point for "not very confident" to 4 points for "very confident," with a higher score indicating higher confidence in nursing performance. In the study by Park [21], the scale had a Cronbach's alpha of 0.94 for reliability; for this study, the Cronbach's alpha was 0.93.

- Learning satisfaction: Measured using a modified and supplemented tool based on that developed by Seong (2008) [22]. This tool consisted of 19 items in total, and each item was rated on a 5-point Likert scale, ranging from 5 points for "strongly agree" and to 1 point for "not at all." A higher score indicates higher learning satisfaction. In the study by Sung, the tool had a Cronbach's alpha of 0.80 for reliability; in this study, the Cronbach's alpha was 0.95.

2.5 Data

Data collection was conducted from March 5, 2018 to April 27, 2018.

The treatment group received an education program using a newly developed PAL method, while the control group received an education program using the traditional educational method. After the education program, the self-efficacy, confidence, and satisfaction of the participants in the different groups were compared.

2.6 Data analysis

With regard to the description of the data, continuous data were expressed as a mean ± standard deviation *(SD)*, and categorical data were expressed by frequency and percentile. In order to test differences in the means of continuous data between the treatment and control groups, a 2-sample t-test was performed under the assumption that there was a normal distribution for the mean based on the central limit theorem. The paired t-test was performed to determine a within-group difference in the mean before and after the education program. Categorical data were analyzed using Fisher's exact test. For "self-efficacy," which showed a significant difference in the pre-test score between the groups, an ANCOVA test was performed to determine a difference in the post-test score between the groups by using the pre-test score as a covariate. The statistical significance level was set at 0.05. All statistical analyses were performed using R version 3.6.1.

3. RESULTS

3.1 Demographic characteristics

The mean ages of those in the treatment and control groups were 23.8 years (*SD* = 2.08) and 23.2 years (*SD* = 1.01), respectively, showing no difference between the two groups (t = 1.49, $p = 0.142$). In terms of the gender ratio of the participants, the numbers of female in the treatment and control group were 25 (86.2%) and 33 (91.7%), respectively, showing no difference between the two groups ($p = 0.69$). All participants were unmarried (Table 1).

Table 1. Participant Characteristics (*n*=65)

Category	Description	Treatment group (n=29)	Control group (n=36)	*p-value*
Age	Mean ± *SD*	23.8±2.08	23.2±1.01	0.142
Sex (n, %)	Female	25 (86.2)	33 (91.7)	
	Male	4 (13.8)	3 (8.3)	0.69
Marriage (n, %)	Unmarried	29 (100)	36 (100)	1

3.2 Main outcomes analysis of the educational program

The mean score for self-efficacy before the education program in the treatment group was 6.11 (*SD* = 1.27), and the mean score after the education program increased to 7.41 (*SD* = 1.41), showing a statistically significant change (t = 4.14, $p < 0.001$). On the other hand, the mean score for self-efficacy before the education program in the control group was 6.91 *(SD* = 1.45) and that after the education program in the control group was 6.58 (*SD* = 1.51), showing no significant change (t = -1.03, $p < 0.309$). In the intergroup analysis, the change before and after the education program was significantly higher in the treatment group than in the control group (t = 3.64, $p < 0.001$).

The mean score for satisfaction before the education program in the treatment group was 3.93 (*SD* = 0.59), while the mean score after the education program was 6.75 (*SD* = 0.45). Meanwhile, the mean score for satisfaction before the education program in the control group was 4.04 (*SD* = 0.43), while the mean score for satisfaction after the education program was 4.20 (*SD* = 0.59), showing no significant change (t = 1.42, $p < 0.164$). A significant change in the satisfaction scores before and after the education program was observed in the treatment group alone (t = 20.95, $p < 0.001$). In the intergroup analysis, the change in the satisfaction score before and after the education program was significantly higher in the treatment group than in the control group (t = 15.4, $p < 0.001$).

The mean score for confidence before the education program in the treatment group was 3.32 (*SD* = 0.47), while the mean score for confidence after the education program was 3.74 (*SD* = 0.24), showing a change that was statistically significant (t = 4.61, $p < 0.001$). The mean score before the education program in the control group was 3.30 (*SD* = 0.42), while its mean score after the education program was 3.34 *(SD* = 0.68), showing no significant change (t = 0.32, $p < 0.75$). In the intergroup analysis, the change before and after the education program was significantly higher in the treatment group than in the control group (t = 2.39, $p < 0.02$) (Table 2).

Table 2. Between-Group Comparison of Main Outcome Variables (*n*=65)

Category	Process	Treatment group (*n*=29)	Within t-value	Within *p*-value†	Control group (*n*=36)	Within t-value	Within *p*-value†	Between t-value	Between *p*-value‡
Self- efficacy	Pre	6.11±1.27			6.91±1.45			-2.37	0.02
	Post	7.41±1.41			6.58±1.51			2.61*	0.011*
	Post - Pre	1.30±1.70	4.14	< 0.001	-0.33±1.90	-1.03	0.309	3.64	< 0.001
Satisfaction	Pre	3.93±0.59			4.04±0.43			-0.9	0.368

	Post	6.75±0.45			4.20±0.59			19.78	< 0.001
	Post - Pre	2.83±0.73	20.95	< 0.001	0.15±0.65	1.42	0.164	15.4	< 0.001
Confidence	Pre	3.32±0.47			3.30±0.42			0.25	0.802
	Post	3.74±0.24			3.34±0.68			3.34	< 0.001
	Post - Pre	0.42±0.49	4.61	< 0.001	0.04±0.78	0.32	0.75	2.39	0.02

* t-value and *P*-value were calculated using ANCOVA

† Within *p*-value was calculated based on paired t-test between Pre and Post

‡ Between *p*-value was calculated based on independent two-sample t-test

4. DISCUSSION

Nurses' expertise, including their nursing knowledge and nursing skills, which are essential for high quality care, can maximize nursing efficiency [23]. In nursing science, education in nursing practice is a key element of nursing education that enables students to integrate their nursing knowledge gained in the field and use it as applicable knowledge [24]. In particular, nursing competence among nursing students should be properly established through the effective learning in the curriculum of core basic nursing skills that are essential because of their high-performance frequency and importance in nursing practice. However, despite the importance of nursing practice education, nursing students fail to master the objectives of practical education because repetitive training with passive forms and evaluation of these do not provide the experience needed for students to understand the actual situation of patients [25]. As an alternative, to overcome this problem, PAL has emerged in medical education [6].

PAL refers to a fundamental learning process, and peer learning, tutoring, and mentoring are related to specific procedures aimed at facilitating that learning process [26]. Peer learning is learner-centered learning that helps students to learn how to share and understand knowledge among themselves [27]. Through this process, learners reflect on their new knowledge and findings, modify their own behaviors, and make their own judgments about how to apply the experiences learned to clinical settings [28].

Nurses need to be equipped with the knowledge and skills, creativity, autonomous inquiry, and teamwork to cope with new changes in the healthcare sector and to provide high quality care to patients. Therefore, it is necessary that students pay attention to the integration of relevant knowledge and to quick and accurate decision-making competences based on autonomy and critical thinking rather than focusing the acquisition of clinical skills [29]. This requires self-efficacy or confidence in one's own ability to perform nursing care successfully [30].

Self-efficacy is affected by past successful experiences, vicarious experiences that change self-efficacy through comparison with peers' achievements, verbal persuasion to believe in one's ability to achieve one's goals, and factors ranging from emotional arousal to subjective threats [17].

PAL provides opportunities for students to review and reinforce what they have learned. It also inspires them to take responsibility and increases their confidence. In addition, it improves students' communication skills, empathy, and observation, and helps their reflection and self-directed learning, thereby enhancing self-efficacy.

Self-efficacy is closely related to academic achievement, inducing students to face challenges and exert effort. It also leads to self-directed learning for new tasks and improves the performance and achievement of given tasks [17].

This study showed that self-efficacy in the treatment group was statistically significantly higher after the education program using PAL than before the education program using PAL. These results are similar to the results of a study by Park and Lee (2008), which found that self-efficacy had a significant effect on basic nursing skills [31].

In addition, these results are also similar to those of a study by Walker-Bartnick et al. (1984) [32], which found that a tutoring program in which senior students offered tutoring to junior students with difficulties in basic science courses received a positive response from both tutors and tutees and had effects on the grades achieved by the latter.

Performance confidence refers to individuals' belief that they can achieve targets they set for themselves [33]. A comparison of differences in performance confidence in this study shows that performance confidence was significantly higher after the education program using PAL than before the education program. This result is similar to that of Bibb and Lefever (2002) [34], who reported that a micro-course developed as PAL at the UCLA School of Dentistry was useful and that, according to student responses, it provided practical and valuable experiences, gave them confidence, helped them understand the curriculum, and helped with presentation skills. PAL programs seem to instill a sense of responsibility and increase confidence, resulting in higher performance confidence. It is thought that the repetitive practice of nursing skills enables students to integrate knowledge and skills, to build confidence in learning contents, and to perform tasks with confidence. We can confirm that PAL learning is a method for improving nursing students' performance confidence in Enema Core Basic Nursing Skills education.

The comparison of differences in learning satisfaction in this study found that learning satisfaction was significantly higher after the education program using PAL than before the education program. This finding is similar to that of a study by Shin (2008) [35], who reported that self-regulated learning ability had a significant effect on learning achievement and learning satisfaction. The outcome is thought to arise because the PAL program provided an opportunity for students to review and reinforce what they had learned in the second year's basic

nursing practice course; enabled peer tutors to understand tutored students' problems—through a comfortable and informal approach—better than professors could; increased role modeling and learning motivation; and prompted students to participate actively in nursing practice, thereby increasing learning satisfaction. Satisfaction with practice means satisfying one's desires and experiencing a sense of accomplishment in the practice process [36]. Higher satisfaction with education is associated with a higher efficiency of education and greater performance [37].

In PAL programs, the teacher-student relationship is changed into a horizontal relationship from the hierarchical relationship of traditional teaching. Senior student tutors were thereby able to help junior students to improve their skills and to reduce their problems and the loneliness experienced in the practice course [38], thereby increasing satisfaction with practice.

Nursing students at a university are supposed to practice the Enema Core Basic Nursing Skills: Level I in the first semester of the second year, followed by the Enema Core Basic Nursing Skills: Level II in the first semester of the fourth year. By using a PAL-based education program, the university became equipped with a more effective learning system for the relevant core nursing skills. In Level II, the self-efficacy and self-confidence of the nursing students were formed through the use of the PAL method, rather than the traditional education method, enabling them to perform enemas accurately and in accordance with its procedures and principles, and to assess accurately and deal quickly with enema according to the situation. As a result, the average academic grade for core nursing skills among fourth-year students improved from 8.79 points (out of 10 points) in the first semester of 2016 to 9.78 points in the first semester of 2018. These results indicate that the PAL program was effective, especially in OSCE, and a year-round PAL was also found to be effective in the areas of communication and nursing skills [39]. These results are consistent with the results of a study showing that the academic achievement level in an anatomy practice course at a medical college in South Korea was higher in a group receiving the PAL program than in a group receiving no PAL program [40]. It is thought that peer feedback itself is a positive help to students' learning process [41], and that it is related to the results of a study [42] showing that negative emotions were high, while positive emotions were low, among those who received feedback from their teacher correcting their performance of nursing skills.

There are concerns about PAL programs that student tutors may have less experience and may deliver knowledge and skills to tutored students in a clumsy way; it also takes time and effort to organize a PAL program, train tutors, and monitor the results [7]. Given these concerns, it is necessary to construct PAL programs carefully. Despite some concerns, PAL has become a common teaching and learning method in medical education owing to a range of advantages [43].

When using the PAL program in this study, the results showed that self-efficacy gave nursing students the performance confidence that they could successfully perform their tasks, the self-regulation to achieve their goals, and the motivation to learn; moreover, performance confidence, satisfaction with practice, and the scores for core nursing skills were also improved through self-directed leaning.

This study is significant because of its development of a PAL program for use in nursing practice education on core basic nursing skills that nursing students should acquire, and empirically examined the effects of that program. Knowledge and nursing skills learned in PAL can become the foundation for strengthening nursing competency and can be used as an effective education and learning strategy. On the basis of the results of this study, it is necessary to develop educational programs that are more diverse and designed to improve self-efficacy and clinical competency among nursing students.

5. CONCLUSIONS

This study developed a PAL program for use in an Enema Core Basic Nursing Skills: Level II course aimed at students at a university and investigated the effects of the program on self-efficacy, performance confidence, and learning satisfaction among nursing students.

The comparison of differences in self-efficacy, performance confidence, and learning satisfaction in this study revealed that the related scores were statistically significantly higher in the treatment group receiving the education program with the use of the PAL method than those of the control group receiving the traditional education. Moreover, the OSCE score was also improved in the treatment group.

It is thought that self-efficacy gives nursing students the confidence that they can successfully perform their tasks, motivates them to learn, and, through self-directed learning, enhances their performance confidence and learning satisfaction; the score for core nursing skills was also improved.

It will be necessary to use extracurricular activities, such as learning clubs, that can promote learning between senior and junior students.

Given the nature of nursing departments that prepare nursing students to acquire core nursing skills, as presented by the KABONE, and to apply them in clinical practice, PAL programs can be suggested as an effective teaching method.

5.1 Limitations

Because the participants in this study are limited to nursing students at a university located in D Metropolitan City, South Korea, it is difficult to generalize the results of this study.

5.2 Suggestions

Further studies are needed to determine the most effective tutor-tutee ratio in PAL groups.

Studies regarding the long-term effects of PAL are also needed to determine the relationship between PAL and clinical nursing care in nurses who have experienced PAL and to analyze the impacts on clinical competency after college graduation.

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