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A Study on the Effects of Retraining of Core Nursing Skills: Focused on Senior-Year Nursing Students

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Abstract

Background/Objectives: The objective of this study analyze the effects of retraining of core nursing skills on the attitude, performance, and confidence of senior-year nursing students.

Methods/Statistical Analysis: We enrolled 61 senior-year nursing students of a university in D city in this study. The experimental treatment and data collection were performed from September 9 to October 1, 2019. We assessed attitude, self-evaluation, and confidence with 18 core nursing skills before and after retraining. The collected material were conducted via frequency analysis, descriptive statistics, and paired t-test using the IBM SPSS Statistics 26.0 software.

Findings: Self-evaluation of performance of core nursing skills significantly improved after retraining compared to the baseline (p=<.001). Confidence with the following core nursing skills significantly differed after retraining : indwelling catheterization (t=-5.11 p=<.001), simple catheterization (t=-3.69 p=<.001), intramuscular injection (t=-3.47, p=.001), intravenous fluid infusion (t=-3.44 p=.001), use of protective devices and management of wastes (t=-3.29 p=.002), subcutaneous injection (t=-3.17 p=.002), basic cardiopulmonary resuscitation (CPR) and use of defibrillator (t=-2.91 p=.005), enema (t=-2.47 p=.017), and transfusion (t=-2.29 p=.025)

Improvements/Applications: This study examined attitude, performance, and confidence with core nursing skills in senior-year nursing students and confirmed that students' skills were improved after retraining.

***Keywords*:** Core nursing skill, Attitude, Competence, Confidence, Nursing students

1. Introduction

Issues on quality evaluation of hospitals, such as accreditation of healthcare facilities, surfacing, patient safety, and quality of nursing service, have become a priority in hospitals in recent years. Securing competence nursing staff is critical to provide high-quality care [1]. However, most hospitals suffer from staff shortage due to the nursing workforce focusing on tertiary hospitals and high nurse turnover [2]. Therefore, clinical settings demand competent nurses who are capable of delivering prompt and proficient work [3]. However, it has been pointed out that newly graduated nurses fall short of the clinical performance demanded in clinical settings to address various health-related needs [3]. Thus, educating and training nursing students to equip them with at least the minimally required standardized clinical competency is an essential focus in nursing education.

The ultimate goal of nursing education is to foster nursing professionals equipped with the core nursing competencies required in nursing practice [4]. To this end, the Korean Accreditation Board of Nursing (KABN) developed a protocol for 20 core nursing skills and presented it as the competencies demand for nursing students by the time of graduation [5]. Core nursing skills are the most fundamental clinical competencies that must be mastered by nurses to resolve patients' health problems [5, 12-15].

In Korea, studies pertinent to core nursing skills among nursing students have examined performance, knowledge, attitude, and confidence with core nursing skills after retraining of some skills [6]. Further, they investigated the relationship between confidence with core nursing skills and critical thinking skills after pre-clinical skill training [7]. Furthermore, they examined the level of experience with core nursing skills and clinical performance [8]. However, most of these studies only assessed some of the core nursing skills, with an objective assessment of the attitude, performance, and confidence with core nursing skills among senior-year nursing students lacking. In present study, we selected 18 core skills discussed to be necessary, administered retraining of these core skills, and examined the effects of retraining.

Specifically, our study aims to investigate the impacts of retraining of core nursing skills on the attitude, performance, and confidence with core nursing skills among senior-year nursing students.

Fourth, we assessed the effect of retraining of core nursing skills of confidence among senior-year nursing students.

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2. Methods

2.1. Study design

The research is a pre-experimental study that applies a one-group pretest-posttest design to assess the impact of retraining of core nursing skills on self-evaluated performance, attitude, and confidence of senior-year nursing students.

2.2. Study participants

Students in the 4th grade of college nursing in D city, who signed informed consent to participate in the study, were enrolled. Using the G*Power 3.1.9.2 program, the minimum sample size for a paired t-test with a significance level of .05, power of .80, and an effect size of .50 was determined to be 34. Still, in consideration of potential withdrawals, we collected data from 73 participants. After excluding 12 questionnaires with careless responses, a total of 61 participants were included in the analysis.

2.3. Instruments

2.3.1. Core nursing skill performance

We assessed core nursing skill performance using the following three items: "I can determine a situation calling for 20 core nursing skills," "I can accurately perform 20 core nursing skills," and "As a professional, I can instill trust to the patient while performing 20 core nursing skills." These self-evaluation questions are rated on a 5-point Likert scale from "Very poor" (1) to "Excellent" (5), and a higher point indicates a more positive self-evaluated performance of core nursing skills.

2.3.2. Attitude toward core nursing skills

Six items deemed appropriate for use in this study were taken from the Learning Attitude Scale developed by the Korean Educational Development Institute and modified by Hwang [9] for use on nursing students. The items were: "I want to be better with the core nursing skills than other students," "I review the core nursing skills I learned during clinical training," "I want to undergo more training of core nursing skills," "I believe that core nursing skills are essential when working as a nurse," "Learning core nursing skills is boring," "Practicing core nursing skills is boring." These questions are rated on a 5-point Likert scale from "Never true" (1) to "Always true" (5), and a higher point indicates a more positive attitude toward core nursing skills.

2.3.3. Confidence with core nursing skills

Of 20 core nursing skills identified by the KABN [5], administering oral medications and managing admissions were excluded. We included the following 18 core nursing skills in this study: take vital signs, give an intramuscular injection, give a subcutaneous injection, give an intradermal injection, give intravenous (IV) fluids, perform intermittent gastric tube feeding, perform simple catheterization, perform indwelling catheterization, and perform an enema. Confidence with core nursing skills was measured based on self-evaluation of the 18 items using a 10-point scale, where a higher score indicates greater confidence.

2.4. Study procedure

The baseline survey was administered on September 9, 2019. Attitude, performance, and confidence with the 18 core nursing skills were surveyed using a structured questionnaire before retraining. We grouped students into teams of 9–10, and training was given by eight clinical nursing professors, with each professor teaching 2–3 skills, over four days (9/9, 9/10, 9/23, 9/24). The professors demonstrated the skills themselves and provided printouts and video materials for the core skills. After training, the students practiced the skills hands-on, and the professors provided various clinical cases in which students could apply the learned skills. After education and training, the core skills were tested, and feedback was provided on the wrong items on the test. The post-training survey was conducted on October 1, a week after the training and core skills test. The baseline and post-training surveys were conducted via self-report using a structured questionnaire.

2.5. Data collection

The data were gathered from September 9 to October 1, 2019. After adequately informing the participants of the purpose and objective of the study, questionnaire contents, confidentiality with personal information, voluntary nature of study participation, and freedom to quit from the study without any penalty, participants who signed an informed consent form were instructed to complete the study questionnaire. Of 75 questionnaires distributed, 14 were excluded due to careless responses or incomplete surveys, and a total of 61 (83.6%) were used in the final analysis.

2.6. Data analysis

The data were evaluated using the IBM SPSS Statistics 26.0 software. Participants' general and learning-related characteristics were conducted using real numbers, percentages, means, and standard deviations, and changes in attitude, self-evaluated performance, and confidence after training were assessed with paired t-test.

3. Results

3.1. General characteristics

Fifty-two (85.2%) participants were female, and nine (14.8%) were male, with a mean age of 22.82 years. GPA in the preceding semester was 3.0–3.9 (n=43, 70.5%), ≤ 2.9 (n=5, 8.2%), and ≥ 4.0 (n=13, 21.3%). Helpful form of training was comprehensive clinical nursing training (n=22, 36.1%) and objective structured clinical examination (OSCE) training (n=20, 32.8%). Thirty-five (57.4%) students were "satisfied" with OSCE training, while 41 (67.2%) students were "satisfied" with comprehensive clinical nursing training. Twenty-nine (n=29, 47.5%) students were "satisfied" with clinical training. Forty-three

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(70.5%) students were “satisfied” with the nursing major. Twenty-four students (70.6%) and 28 students (82.4%) chose “high” in their interest in basic nursing training and clinical training, respectively (Table 1).

Table 1. General characteristics of subjects (N=61)

Characteristics	Categories	N(%) or Mean±SD
Sex	Male	9(14.8)
	Female	52(85.2)
Age(yr)		22.82±1.31
Academic achievement	≤2.9	5(8.2)
	3.0~3.9	43(70.5)
	4.0 ≤	13(21.3)
Helpful practical training	clinical practicum	17(27.9)
	OSCE practicum	20(32.8)
	comprehensive clinical practicum	22(36.1)
	etc.	2(3.3)
Satisfaction with OSCE practicum	Satisfaction	35(57.4)
	Common	26(42.6)
	Dissatisfaction	0(0.0)
Satisfaction with comprehensive clinical practicum	Satisfaction	41(67.2)
	Average	19(31.1)
	Dissatisfaction	1(1.6)
Satisfaction with clinical practicum	Satisfaction	29(47.5)
	Average	25(41.0)
	Dissatisfaction	7(11.5)
Satisfaction with major	Satisfaction	43(70.5)
	Average	18(29.5)
	Dissatisfaction	0(0.0)

3.2. Attitude toward core nursing skills

The mean score for attitude toward core nursing skills was 3.82 before training and 3.89 after training, showing no statistically significant change (p=.390) (Table 2).

Table 2. Pretest and posttest difference in attitude to core basic nursing skills

Variables	Pre	Post	Difference	t(p)
	Mean±SD	Mean±SD	Mean±SD	
Attitude	3.82±0.55	3.89±0.61	-0.06±0.56	-0.87(.390)

3.3. Performance of core nursing skills

The mean score for the performance of core nursing skills was 3.26 before training and 3.55 after training, showing a statistically significant increase (p=<.001) (Table 3).

Table 3. Pretest and posttest difference in self-evaluation to core basic nursing skills

Variables	Pre	Post	Difference	t(p)	
	Mean±SD	Mean±SD	Mean±SD		
self-evaluation	3.26±0.57	3.55±0.66	-0.28±0.07	-4.30	<.001

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3.4. Confidence with core nursing skills

The mean score for confidence with core nursing skills was 6.99 before training and 7.42 after training, showing a significant increase (p=.002). More specifically, confidence with taking vital signs was the highest after training (9.23±1.10), followed by performing oxygen therapy using a nasal cannula (8.70±1.36) and measuring peripheral saturation and monitoring ECG (8.69±1.41). In contrast, confidence in managing the tracheostomy tube was the lowest (5.66±2.24), flowed by performing indwelling catheterization (6.21±2.00) and performing blood transfusion (6.57±1.79).

Confidence with the following skills statistically significantly differed after retraining: give intramuscular injection (t=-3.47, p=.001), give subcutaneous injection (t=-3.17 p=.002), give IV fluids (t=-3.44 p=.001), perform simple catherization (t=-3.69 p=<.001), perform indwelling catheterization (t=-5.11 p=<.001), perform enema (t=-2.47 p=.017), manage tracheostomy tube (t=2.81 p=.007), use protective devices and manage wastes (t=-3.29 p=.002), perform basic CPR and use defibrillator (t=-2.91 p=.005), and perform blood transfusion (t=-2.29 p=.025) (Table 4).

Table 4. Pretest and posttest difference in Self confidence in performance to core basic nursing skills

Variables	Pre	Post	Difference	t(p)
	Mean±SD	Mean±SD	Mean±SD	
Self confidence in performance	6.99±1.44	7.42±1.33	-0.43±1.02	-3.29 (.002)
Vital sign	9.26±1.45	9.23±1.10	0.03±1.43	0.18 (.858)
Intramuscular injection	6.84±2.11	7.61±1.74	-0.77±1.74	-3.47 (.001)
Subcutaneous injection	7.28±1.73	7.97±1.52	-0.69±1.70	-3.17 (.002)
Intradermal injection	7.28±1.75	7.64±1.74	-0.36±1.67	-1.68 (.098)
Peripheral intravenous fluid injection	5.92±2.12	6.72±2.25	-0.80±1.82	-3.44 (.001)
Intermittent gastric tube feeding	7.44±1.87	7.75±1.74	-0.31±1.41	-1.73 (.089)
Simple catheterization	5.98±1.97	6.84±1.81	-0.85±1.81	-3.69 (<.001)
Indwelling catheterization	5.20±1.90	6.21±2.00	-1.02±1.55	-5.11 (<.001)
Enema	6.39±2.00	6.95±1.84	-0.56±1.77	-2.47 (.017)
Pre operative care	7.49±1.78	7.77±1.87	-0.28±1.68	-1.29 (.201)
Post operative care	7.56±1.77	7.87±1.82	-0.31±1.51	-1.61 (.113)
Oxygen saturation measurements & EKG monitoring	8.56±1.59	8.69±1.41	-0.13±1.19	-0.86 (.393)
Oxygen therapy with nasal canulla	8.34±1.75	8.70±1.36	-0.36±1.67	-1.68 (.098)
Endotracheal suction	6.82±1.82	6.62±1.90	0.20±1.51	1.01 (.314)
Tracheostomy care	6.39±1.84	5.66±2.24	0.74±2.05	2.81 (.007)
Wearing protection equipments and managing medical wastes	7.16±2.19	8.11±1.63	-0.95±2.25	-3.29 (.002)
Application of CPR and defibrillator	6.02±2.25	6.70±1.94	-0.69±1.85	-2.91 (.005)
Blood transfusion	5.92±2.15	6.57±1.79	-0.66±2.24	-2.29 (.025)

4. Discussion

This study analyzed the changes in attitude, performance, and confidence with 18 core nursing skills after retraining among fourth-year nursing students. The results explained that the performance of core nursing skills and confidence with 18 core nursing skills improved after retraining.

The mean performance score was 3.26 before training, which significantly increased to 3.55 after training. The score significantly changed from 3.43 to 3.63 after training in the study that assessed the effects of the core nursing skill education program conducted six months before graduation in fourth-year nursing students by Kim et al. [7]. Further, although a different scale was used and thus the scores cannot be compared directly, the score for the performance of core nursing skills significantly increased after the retraining program in the study by Jung and Kwon [6], which was similar to our findings. In our study, the performance was measured via self-evaluation, and we speculate that increased confidence with the core nursing skills after retraining also increased their self-evaluated performance.

By each core nursing skill, retraining statistically significantly increased confidence with the following nine skills: give an intramuscular injection, give a subcutaneous injection, give IV fluids, perform simple catheterization, perform indwelling catheterization, perform an enema, wear protective devices and manage wastes, perform basic CPR and use a defibrillator, and perform a blood transfusion. On the other hand, confidence in managing the tracheostomy tube decreased after retraining, from

6.39 to 5.66, which was the lowest confidence score among all 18 items. Jeon [10] also observed that the score for confidence with tracheostomy tube (3.02; measured with 5-point Likert scale) was lower than that of other skills among fourth-year nursing students. Han et al. [11] also reported that the score for managing the tracheostomy tube measured with a 5-point Likert scale is on the low side (2.88). As shown here, managing tracheostomy tubes is one of the skills students perceive to be difficult, and the students who participated in this study were commented and given more feedback during the retraining of these skills compared to other skills. In the study by Han et al. [11], students who have experienced a simulation training demonstrated lower confidence in nursing skills than those who have not, and this was interpreted as that students realize how poor their nursing skills are while listening to the feedback given during the debriefing process. It is surmised that students would have also perceived the management of tracheostomy tubes to be more difficult as they are commented and given feedback during the retraining, which would have diminished their confidence. Additional studies are needed on the factors that affect confidence with specific skills that were not significantly changed after retraining.

The ultimate goal of retraining of core nursing skills is to equip fourth-year nursing students with the basic clinical practice competencies demanded in clinical settings. According to several past studies, clinical performance increases with increasing performance frequency and confidence [8,10,]. Therefore, the retraining of core nursing skills administered on fourth-year nursing students in this study is believed to contribute to boosting their clinical performance required by the time of graduation by improving their competency and confidence. Furthermore, on-campus training and clinical training should be implemented to give students more opportunities to perform nursing skills to improve their clinical competencies, and repeated training and repeated assessment of specific goal-achievement pertaining to core nursing skills, as opposed to one-time training and assessment, should be performed for some skills for which students demonstrate low confidence.

On the other hand, there were no significant changes in students' attitudes toward core nursing skills after retraining. Because the number of items and conversion scores are different, scores cannot be directly compared, Jung and Kwon [6] also reported that there were no significant changes in the score for attitude toward core nursing skills after a retraining program. Further studies are needed to examine the impact of retraining of core nursing skills on attitude.

This report was a pre-experimental study without a control group, and thus the influence of exogenous variables, such as interference by a third variable, cannot be eliminated. Additionally, the study population was limited to fourth-year students of a single university, and the findings were not compared with nursing students of other schools. Furthermore, we measured the performance of core nursing skills via self-evaluation. Therefore, subsequent studies should shed light on the relationship between self-evaluated performance scores and actual performance, and studies should also utilize objective measures of performance.

Despite these limitations, however, this study is significant as a study that evaluated the impacts of retraining of core nursing skills in fourth-year nursing students. More specifically, it examined students' performance and confidence with 18 core nursing skills after retraining. As well, it discussed skills with which students show low confidence even after retraining, thereby providing useful data for developing an effective and systematic education strategy for clinical practicum and nursing students.

5. Conclusion

This report assessed changes in confidence, attitude, and performance with core nursing skills after retraining to examine the effects of retraining of core nursing skills in fourth-year nursing students.

The results explained that there were no significant changes in the attitude toward core nursing skills after retraining and that the mean self-evaluated performance score and mean confidence score for 18 items were improved. However, the confidence score for managing tracheostomy tubes, which was the lowest among the scores for 18 items, actually decreased after retraining, calling for measures to provide opportunities for students to practice the skill repeatedly and improve them. Further, the educational curriculum that bridges theory to practice needs to be developed via periodic meetings between schools and clinical training facilities. In the future, studies should assess all 20 items announced by the KABN and objectively assess students' performance of the skills. Further, as this research was measured only on nursing students of a single school, subsequent studies should diversify their study population to improve the generalizability of the findings.

6. References

1. Lee, J. M., Gang, I. S., & Yu, S. J. (2015). The influence of nursing informatics competency on job-satisfaction and nursing performance. The Korean Journal of Health Service Management, 9(1), 109-122. https://doi.org/10.12811/kshsm.2015.9.1.109
2. Hong, J. Y., Chae, J., Song, M. R., & Kim, E. M. (2017). A utilization strategy of nursing staff by types of medical institutions-nurse staffing level of medium and small-sized hospitals. Journal of the Korea Academia-Industrial Cooperation Society, 18(8), 162-170. https://doi.org/10.5762/KAIS.2017.18.8.162
3. Park, H. S., & Han, J. Y. (2013). Factors influencing clinical competence in nursing students. Journal of Korean Academy of Fundamentals of Nursing, 20(4), 438. https://doi.org/10.7739/jkafn.2013.20.4.438
4. Waldner, M. H., & Olson, J. K. (2007). Taking the patient to the classroom: Applying theoretical frameworks to simulation in nursing education. International Journal of Nursing Education Scholarship, 4(1). https://doi.org/10.2202/1548-923X.1317
5. Korean Accreditation Board of Nursing Education. (2017). Core clinical nursing skill evaluation items for Korean nursing education accreditation assessment. Retrieved from:

http://kabone.or.kr/HyAdmin/upload/goodFile/120180126142812.pdf (website)
6. Jung, M. S., & Kwon, Y. S. (2015). The effects of convergence-based reeducation on core basic nursing skills on nursing students' competence and confidence. Journal of digital Convergence, 13(4), 295-302. https://doi.org/10.14400/JDC.2015.13.4.295
7. Kim, Y. H., Hwang, S. Y., & Lee, A. Y. (2014). Perceived confidence in practice of core basic nursing skills of new graduate nurses. The Journal of Korean academic society of nursing education, 20(1), 37-46. http://doi.org/10.5977/jkasne.2014.20.1.37
8. Choi, D. (2014). Clinical competence according to experiences on the essential of fundamental nursing skills in nursing students. The Journal of Korean academic society of nursing education, 20(2), 184-191. https://doi.org/10.5977/jkasne.2014.20.2.184
9. Hwang, S. Y. (2003). Effects of problem-based learning on the knowledge achievement, critical thinking ability, attitude and motivation toward learning of nursing students. *Unpublished doctoral dissertation, Chonnam National University, Gwangju*.
10. Jeon, H. (2018). A Study of Convergence on Experiences of Clinical Performance and Self-Confidence of Core Basic Nursing Skills, Clinical Competence in Nursing Students. *Journal of the Korea Convergence Society*, *9*(11), 569-579. https://doi.org/10.15207/JKCS.2018.9.11.569
11. Han, A., Cho, D. S., & Won, J. (2014). A study on learning experiences and self-confidence of core nursing skills in nursing practicum among final year nursing students. *Journal of Korean Academy of Fundamentals of Nursing*, *21*(2), 162. https://doi.org/10.7739/jkafn.2014.21.2.162
12. Mishra, S., Tripathy, H. K., Mallick, P. K., Bhoi, A. K., & Barsocchi, P. (2020). EAGA-MLP—An Enhanced and Adaptive Hybrid Classification Model for Diabetes Diagnosis. Sensors, 20(14), 4036.
13. Bhoi, A. K., Mallick, P. K., Liu, C. M., & Balas, V. E (Eds.) (2021). Bio-inspired Neurocomputing, Springer.
14. Oniani, S., Marques, G., Barnovi, S., Pires, I. M., & Bhoi, A. K. (2020). Artificial Intelligence for Internet of Things and Enhanced Medical Systems. In Bio-inspired Neurocomputing (pp. 43-59). Springer, Singapore.
15. Marques, G., Bhoi, A.K., Albuquerque, V.H.C. de, K.S., H. (Eds.) (2021). IoT in Healthcare and Ambient Assisted Living, Springer