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Efficacy of an error reporting-based education program on nursing students' skill confidence, immersion, and satisfaction

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ABSTRACT

The purpose of this study is to assess the impact of an innovative 'practice education program utilizing error reporting' on nursing students' immersion in practice, learning satisfaction, and confidence in executing fundamental nursing skills. Conducted over two days (November 28-29, 2022), this descriptive research engaged 110 second-year nursing students from a university in City S. The program, encompassing 24 sessions, each lasting an hour, culminated in debriefings and reflective exercises. Methodologically, the study employed an array of statistical tools, including independent t-tests, one-way ANOVA, Cheffe's test, Pearson's correlation coefficient, and multiple regression analysis. Key findings revealed a significant positive correlation between confidence in core nursing skill execution and practice immersion (r=.259, p=.006), as well as between practice immersion and learning satisfaction (r=.266, p=.005). Notably, practice immersion emerged as a pivotal factor influencing core nursing skill performance confidence (β=.272, p=.006), underscoring that heightened immersion positively impacts skill confidence. These insights suggest the need for ongoing program development, reinforced education, and heightened awareness around error prevention and reporting, to further augment nursing education outcomes.

1. Introduction

At present, as the pace of industrialization accelerates due to the Fourth Industrial Revolution and innovation in medical services, information and communication technologies such as the Internet of Things, cloud computing, and big data, as well as core technologies such as artificial intelligence, robotics, 3D printing, and augmented reality, are also being applied in the medical field. With their rapid application, the healthcare ecosystem is changing in the direction of expanding from diagnosis- and treatment-centered medical services to a patient-centered, customized lifelong health management system from prevention to follow-up care (Ross and Maynard, 2021; Andreadis et al., 2022; Araújo, 2020; KHIDI, 2012).

These rapid changes and developments in the field of healthcare require advances in education and training to ensure that not only healthcare workers in the field but also the next generation of healthcare workers, can fully demonstrate the capabilities expected in the field through the full acquisition of new knowledge and innovative technologies (IOM, 2016). Therefore, the nursing profession, which plays a pivotal role in health care, should be quick to recognize these changes and respond preemptively, not only to promote the health of the nation but also to promote professional development. Nursing is a practical discipline, and nurses need to be equipped with knowledge-based practical skills in addition to professional knowledge to fully demonstrate their ability to solve patients' health problems (Lee et al., 2021; Waldner and Olson, 2007).

Nursing practice education plays a key role in developing nurses with clinical competence by enabling them to apply the nursing knowledge and skills learned at school in various clinical situations (Shin and Cho, 2012). If you grow into a new nurse with high self-confidence in performing nursing skills, your job performance is high and your work stress is low. Sufficient practice training before graduation will help prevent nurses from maladaptation to the practice field due to a lack of clinical performance skills and improve their work performance competency (Bang and Kim, 2014).

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However, the number of nursing students has increased rapidly due to the recent establishment and expansion of nursing departments in Korea, and there are many cases where there are no hospitals or foundation hospitals, resulting in a shortage of practice sites. Furthermore, there are many cases in which subjects are reluctant to receive nursing from practice students due to changes in their perception, and most of the clinical practice of students is actual nursing practice due to ethical problems when nursing students who have not been issued a license directly perform nursing skills while the practice is focused on observation rather than taking on the actual act of nursing (Kim et al., 2010).

It has been confirmed that such observation-centric practices have a high probability of medical errors (Kim et al., 2007b). Among various measures to manage and prevent errors, the most effective is the use of an error reporting system that prevents recurrence by reporting errors that have already occurred (Kim et al., 2007b; Weingart et al., 2001). It is absolutely necessary to expand the knowledge of error reporting of nursing students through education for error reporting. The reason for the nurses' lack of awareness about error reporting is a lack of positive recognition, reluctance to report due to fear of punishment or blame, and lack of awareness about the necessity of reporting. and it has been confirmed that there is a lack of self-awareness (Elder et al., 2007). Accordingly, having a positive attitude in nursing students can be a factor in improving the health of the subjects. In addition, it would be helpful for nursing organizations to have the nurses build a patient safety culture (Sexton et al., 2000).

Hence, there is a need to provide education to actively participate in error reporting, based on the practice immersion in nursing skills, learning satisfaction, and confidence in performing core nursing skills through the improvement of nursing skill skills through error reporting education for nursing students, improvements will have to be made (Etchell et al., 2003). Through this series of training courses, it is expected that when performing duties as a clinical nurse in the future, confidence in nursing skills and awareness of patient safety will be heightened, and much more efficient nursing will be achieved for the subject. conducted a study on medication administration (Kim, 2021), operating room nursing errors (Seo and Kim, 2021), and experiences related to nursing errors (Park and Kong, 2021). Hence, this study seeks to prepare foundational materials for developing an effective learning strategy for fostering nursing students into competent professional nursing personnel by confirming the effects of practice education using error reporting for nursing students on practice commitment to nursing skills, learning satisfaction, and core nursing skill performance confidence.

The purpose of this study is to develop and apply an educational module for a practical education program using error reporting for nursing students. The specific purposes are to:

1. Develop an educational module for a practical training program using error reporting for nursing students.
2. Apply the education module for the utilization of error report practice education program, identify the extent of practice immersion, learning satisfaction, and core nursing skill performance confidence level.
3. Confirm the correlation between the subjects' practice immersion, learning satisfaction, and confidence in core nursing skills.
4. Confirm the factors affecting the extent of self-confidence in core nursing skills of the subjects.

2. Research method

This study is a descriptive research study that develops and applies an 'error reporting utilization practice education program' for students in the department of nursing to check practice immersion, learning satisfaction and satisfaction, and confidence in performing core nursing skills.

The subjects of this study were 2nd-year students who participated in basic nursing theory and practice education from March through December 2022 at the Department of Nursing at S University located in City S. 114 students who understood the purpose of the study and gave written consent to participate in the study were selected as the research subjects. Out of 114 distributed questionnaires, 101 copies were collected (response rate of 88.6%) and finally analyzed.

The measurement tool used for the study can be summarized as follows:

1. Practice immersion: The extent of immersion in practice (Engeser and Rheinberg, 2008) was measured by flow short scale, which Yoo (2016) verified the validity of the Korean language. A total of 10 questions, on a 5-point scale, the score ranges from 10 to 50, with higher scores indicating higher levels of immersion. At the time of development, Cronbach's alpha value was .92, .84 in Yoo's (2016) study, and .93 in this study, respectively.
2. Learning satisfaction: The tool developed by Jung (2005) was modified and supplemented by the researcher to be suitable for this study, and then the content validity was verified. Content validity was tested by a group of three experts, two professors of basic nursing and one professor of adult nursing, and only items with a Content Validity Index (CVI) of .80 or higher were selected and used. Each item is on a Likert scale ranging from 1 point for "not at all" to 5 points for "very much so", and higher scores mean higher learning satisfaction. At the time of development, Cronbach's α value of reliability was .75, and in this study, Cronbach's α value was .94, respectively.
3. Confidence in core nursing skills: Confidence in performing core basic nursing skills is a subjective score for the extent of confidence that nursing

students perform core basic nursing skills during the practice course for 20 core basic nursing skills presented by the Korean Accreditation Board of Nursing Education. Ranging from 'Can do it skillfully' for 5 points, 'Can do it well' for 4 points, 'Can do it to some extent' for 3 points, 'Improficient but can do it' for 2 points, to 'I can't do it at all' for 1 point, it indicates the evaluation score written in the questionnaire. The higher the measurement score, the higher the confidence in performance. As for the reliability of the tool, Cronbach's α value in the study of Bang and Kim (2014) was .95, and Cronbach's α value in this study was .90, respectively.

2.1. Error report utilization training program development process

The development of the educational program in this study consisted of five stages of analysis, design, development, implementation, and evaluation based on the ADDIE model, a representative teaching system design (Table 1).

Table 1: Formation of scenario of practice training program using error reporting

Core nursing skills	Error content	Error items No
Administration 1 (oral administration, intramuscular injection)	Injection area, medication confirmation error, preparation error, recording error	8
Administration 2 (subcutaneous injection, intradermal injection)	Preparation error, patient identification error, record error, separate recycling collection error	8
Excretion (exhaustion enema, indwelling catheterization)	Error in preparation, error in nursing performance	8
Nutrition (gavage, intravenous infusion therapy)	Error in medication confirmation, error in nursing performance, error in preparation	8
Safety requirements (bandage method, protection)	Nursing knowledge errors, nursing practice situation errors	7
Oxygenation 1 (electrocardiogram, nasal cannula)	Order confirmation error, nursing performance error, preparation error, machine operation error	7
Administration 3 (transfusion therapy)	Error in medication confirmation, error in nursing performance, error in separate recycling collection, error in patient identification	7
Surgery cycle care (pre-surgery care, post-surgery care)	Nursing performance error, patient identification error, and preparation error	6

2.2. Analytical step

In the analytical step, domestic and foreign literature reviews and preceding studies were conducted. In the literature review process, domestic and foreign literature related to core nursing skills was searched, and as a result of the search, it was confirmed that nursing students' nursing skills competency was strengthened through systematic regular course education such as curriculum management, simulation, and core nursing skills evaluation in nursing colleges. Following this, in order to assess the educational needs of the research subjects for nursing skills, a self-reported diagnostic evaluation form was distributed to 114 patients before class. Based on this, the interest in core nursing skills was confirmed, and the educational direction of nursing skills and the necessity of systematic practice education were confirmed.

2.3. Design step

In the design step, the purpose and goal setting of the educational program, the composition of program contents, educational methods, and evaluation tools were designed. The goal of the program was designed to 'improve core nursing skills through a practical training program using error reporting' based on domestic and international research and policy cases in the analytical step. Based on the patient safety simulation scenario development (Yu et al., 2021), this study was designed in the order of (1) template composition and contents, (2) evaluation, and (3) debriefing, respectively.

2.4. Development stage

2.4.1. Template composition and contents

Scenario design is a step of drawing a blueprint for the operation of an error-reporting practical training program using a template. This study was developed in accordance with the components of the simulation scenario template presented in the guidelines for the development of evidence-based clinical simulation scenarios (Waxman, 2020). Scenario templates include learning goals (broad goals, specific learning goals, and main factors (algorithms), plans for assessment and measurement tools (evaluation methods), presentation of evidence for learning goals and assessments, learners' prior learning, and general debriefing plans are included, and it is proposed to evaluate and verify validity during the development process. Hence, this study was intended to proceed to the validity evaluation stage.

The topics to be developed in this study were developed in eight sections of 10 minutes each, determining that there were many types of core nursing skills to be included in one scenario, and the operating time would take more than 60 minutes. Furthermore, in each scenario, various situations such as medication, excretion, safety, and oxygenation were configured to ensure that the core nursing skills learned through basic nursing practice classes could be experienced. Each scenario includes one or more core nursing skills, and it is planned to implement errors in nursing situations using mannequins and medical instruments. For the order of progression of the scenario, referring to the three

steps of identifying, interrupting, and correcting errors for patient safety presented in a previous study (Henneman et al., 2010), this study identifies and resolves errors related to core nursing skills and a large frame of discussion and technology in the solution finding-solving stage was formed.

The constructed program went through a program validity test by 3 nursing professors. After providing the content of the program composed to each expert, an evaluation was requested with 8 questions on a 4-point scale, and the validity of the content of the evaluation questions for each scenario was rated on a 4-point scale, from 'not appropriate at all' to 4, from 1 to 'very appropriate'. It was evaluated up to a point, and a scenario with a Content Validity Index (CVI) of .80 or higher was adopted. The average score of the Content Validity Index (CVI) was .90 (Table 2).

2.4.2. Evaluation

The evaluation is for the instructor to evaluate the learner's performance after the end of the program, and the evaluation areas and stages were configured for each of the 8 scenarios. In accordance with the goal to be achieved in this scenario, the items that students must perform were listed and reorganized as evaluation items.

2.4.3. Debriefing

Debriefing is a reflection process in which learners share their feelings about nursing after experiencing the program, and in this study, 'Context' presented by Gross Forneris and Fey (2016), Content (Content), and Course (Process)' were applied. A dialogue structure was provided to ensure that the instructor could use his or her knowledge to help learners discern meaningful and relevant content and solve problems in nursing practice. The guiding questions about the context were structured to ensure that the patient could tell about the patient's main problem, what kind of situation it was, and how he or she felt or thought about the performance. The content uses objective and specific data to clarify perspectives, discuss learners' thoughts during practice, what knowledge has influenced their thoughts, and how the past practice experience and knowledge that students have helped in the current situation, and it includes an analysis process for error checking asking when it was helpful. The course was composed of questions to induce thinking about the goals of future practice classes regarding the learning effects learned through error reporting and their utilization.

2.4.4. Execution step

The program intervention was executed for a total of 24 sessions of 1 hour each for 2 days on November 28-29, 2022. Before the experiment, the detailed core skill protocol and program operation method were announced, and after the application of the program, the instructor measured the students' ability to report errors and discriminate. After mediation, debriefing was conducted, and confidence in the performance of core nursing skills was collected through the same questionnaire as well as practice immersion and learning satisfaction. Responding to the questionnaire took less than 10 minutes, and a researcher was selected as a data collection assistant to distribute and collect the questionnaire to the study subjects and help the program run amicably.

2.4.5. Evaluation step

The final program was finalized based on the expert validity results for the error reporting utilization practice training program. As a tool to evaluate the effectiveness of the program, self-reported questionnaires were conducted immediately after the program was completed to evaluate immersion in practice, satisfaction with learning, and confidence in performing core nursing skills. At the end of each session, the debriefing contents on the day's educational program were evaluated.

2.5. Data analysis

The collected data were analyzed using the SPSS/Win 26.0 program as follows:

1. The frequency, percentage, mean and standard deviation of the subjects' general characteristics, practice immersion, learning satisfaction, and confidence in core nursing skills were obtained using descriptive statistics.
2. Differences in immersion in practice, learning satisfaction, and confidence in performing core nursing skills according to the general characteristics of the subjects were analyzed using independent t-test and one-way ANOVA, and Scheffe's test was used for the post hoc test.
3. The correlation between the extent of practice immersion, learning satisfaction, and confidence in performing core nursing skills was identified by Pearson's correlation coefficient.
4. The effect on self-confidence in core nursing skills was analyzed by multiple regression analysis.

3. Research results

3.1. General characteristics, level of practice immersion, learning satisfaction, confidence in performing core nursing skills

The subjects were 20 to 25 years old, 85%, and 79.1% were female. 62.7% of respondents answered that they were satisfied with their major, 55.5% of their academic achievement was average, and 39.1% of them were satisfied. In general characteristics, there was a significant correlation between

immersion in practice, gender (t=-2.370, p=.021), and academic achievement (F5.856, p=.004) (Table 2).

3.2. The subjects' practice immersion, learning satisfaction, and confidence in performing core nursing skills

It turned out that the subjects' immersion in practice was 3.7 ± .61, and learning satisfaction was 4.2 ±. .511, and core nursing skill performance confidence was 3.7 ± .42 (Table 3).

3.3. Correlation among practice immersion, learning satisfaction, and confidence in core nursing skills

Confidence in performing core nursing skills demonstrated a significant positive correlation between immersion in practice (r=.259, p=.006). Furthermore, it turned out that there was a significant correlation between immersion in practice and learning satisfaction (r=.266, p=.005) (Table 4).

Table 2: General characteristics of and differences among practice immersion, learning satisfaction, and core nursing skill performance confidence (N= 110)

Characteristics	Categories	n	(%)	Degree of immersion in practice		Learning satisfaction		Core nursing skills performance confidence	
				M±SD	t/F(p) Scheffe	M±SD	t/F(p) Scheffe	M±SD	t/F(p) Scheffe
Age (year)	20~25	85	77.3	3.77 ± .66	.482 (.930)	4.18 ± .52	.846 (.611)	3.73 ± 0.39	1.370 (.188)
	26~30	20	18.2	3.64 ± .36		4.16 ± .50		3.56 ± 0.48	
	30< n	5	4.5	3.35 ± .46		4.16 ± .42		3.29 ± 0.52	
Gender	Male	23	20.9	3.5 ± 0.41	-2.370 (.021)	4.29 ± .48	1.219 (.225)	3.54 ± 0.45	.824 (.086)
	Female	87	79.1	3.8 ± 0.64		4.15 ± .52		3..71 ± 0.41	
Major satisfaction	Satisfactory	69	62.7	3.63 ±.54	2.532 (.084)	4.17 ± .51	.474 (.624)	3.67 ± 0.45	.593 (.554)
	Average	39	35.5	3.90 ± .70		4.21 ± .51		3.67 ± 0.38	
	Unsatisfactory	2	1.8	3.85 ± .61		3.85 ± .64		4.00 ± 0.07	
Academic achievement	Satisfactory(a)	43	39.1	3.61 ± .54	5.856 (.004) a<b+c	3.68 ± .41	.112 (.994)	3.68 ± 0.41	.006 (.994)
	Average(b)	61	55.5	3.87 ± .62		3.68 ± .44		3.67 ± 0.44	
	Unsatisfactory(c)	6	5.5	3.13 ± .61		3.67 ± .34		3.67 ± 0.34	

Table 3: Levels of immersion in practice, learning satisfaction, and core nursing skill performance confidence (N= 110)

Variables	Possible range	Min	Max	Mean	SD
Degree of immersion in practice	1~5	2.7	5.0	3.7	.61
Learning satisfaction	1~5	3.4	5.0	4.2	.51
Core nursing skill performance confidence	1~5	2.8	4.5	3.7	.42

Table 4: Correlations among immersion, learning satisfaction, and confidence in core nursing skills (N=101)

Variables	Degree of immersion in practice	Learning satisfaction	Core nursing skill performance confidence
	r (*p*)	r (*p*)	r (*p*)
Degree of immersion in practice	1		
Learning satisfaction	.266** (.005)	1	
Core nursing skill performance confidence	.259** (.006)	.024 (.807)	1

**: p<0.01

3.4. Analysis of the factors influencing the core nursing skills performance confidence

In the course of verifying the presence of multicollinearity among various predictors aimed at ascertaining the determinants influencing the subjects' assurance in executing fundamental nursing competencies, an analysis was conducted. This analysis revealed that the Variance Inflation Factor (VIF) stood at 1.076, markedly below the conventional threshold of 10. Concurrently, the tolerance parameter was observed at 0.929, surpassing the typically accepted benchmark of 0.1. These findings collectively suggest the absence of significant multicollinearity concerns within the dataset.

Further, in addressing the residual independence within the model, the application of the Durbin-Watson statistic yielded a value of 1.599. This result substantiates the lack of autocorrelation among the independent variables, thereby reinforcing the model's validity.

Subsequent to the execution of multiple regression analyses, it emerged that the predominant factors exerting influence on the confidence in performing essential nursing skills were the degree of immersion in practical experience (β = .272, p = .006) and the level of

learning satisfaction (β = -.049, p = .616). Notably, it was deduced that an enhanced engagement in practical activities positively correlates with an increase in confidence regarding the execution of core nursing skills. Furthermore, the explanatory power of these variables was quantified to be 5.2%, indicating a modest yet noteworthy impact on the overall model (Table 5).

4. Discussion

Currently, in Korea, the introduction of an error reporting system for patient safety is at a lower level than in other countries, and hospitals are building error reporting programs, it is reported that support from medical institutions for patient safety and medical error reporting is very insufficient (Kim et al., 2007a). Nursing students are in charge of clinical practice immediately after graduation, and there is a high possibility of medical errors due to unfamiliar nursing skills. Hence, correct knowledge and attitudes regarding patient safety must be acquired through systematic error reporting education from the nursing school curriculum. This study attempted to examine and understand the factors affecting core nursing skills error reporting after developing a core nursing skills error reporting education program for nursing students. In this study, the core nursing skills error reporting program was organized in the order of identifying errors, finding solutions, and solving steps. The first emphasized the legitimacy of error checking. By explaining the occurrence of frequent errors that can occur in clinical situations and emphasizing that continuing incompetence can be developed if these mistakes are covered up, positive perceptions about reporting errors were made (Weaver et al., 2008). Second, to find a solution to the error content, the reported error content was recognized. It was announced that the purpose of this report was to find out the contents of the error and prevent duplication of contents, and not to criticize or expose the reported error, but to identify and prevent the type of error. As the third solution step, it was explained that nurses should have the ethical responsibility to protect patients' rights and interests and that patients' safety should come first. Through such a program, it is considered that core nursing skills errors can be reduced, and immersion in practice, satisfaction, and confidence in education can be improved, thereby increasing the effectiveness of education. As the current core nursing error reporting program is difficult to compare with previously developed programs, it is considered that objective evaluation and supplementation of the core nursing error reporting program will be necessary through future studies.

Table 5: Factors affecting practice immersion and learning satisfaction on performance confidence (N=110)

Independent variable	B	SE	*β*	t	*p*	Tol	VIF
Constant	3.145	.362		8.689	<.001		
Degree of immersion in practice	.188	.067	.272	2.809	.006	.929	1.076
Learning satisfaction	-.040	.080	-.049	-.503	.616	.929	1.076

R=.263; R2=.069; Adjusted R2=.052; F=3.977; *p*=.022; Durbin-Watson *d*= 1.599

In this study, the average level of immersion in practice was 3.70 points out of 5 points, and the level of learning satisfaction was confirmed as an average of 4.20 points out of 5 points. Nursing and in the case of a previous study (Kang and Hwang, 2022) targeting health students, the average score of immersion in practice was 4.73 points and the average score of learning satisfaction was 4.49 points, which was higher than the results of this study. Based on the results of this study, it is necessary to improve through feedback after applying the core nursing skills error reporting program to nursing students to ensure that the core nursing skills error reporting program can increase immersion in practice and improve the satisfaction of education.

Confidence in performing core nursing skills was demonstrated to be an average of 3.70 points, and in a study (Suh, 2012) conducted with nursing students using the same tool as this study, the overall average was 4.90, which was higher than that of this study. Confidence in performing core nursing skills improves with repeated practice and as the grade goes up, it is considered that core nursing skills are repeatedly reconstructed by grade level and repeated research is needed in the future. In the general characteristics, there was a statistically significant difference in practice commitment according to gender, and nursing In a previous study (Kang and Hwang, 2022) targeting students in the nursing and public health department, it was confirmed that the results of this study were similar to the results of this study, as there were differences in practice commitment by gender. The Core Nursing Error Reporting Program is an important part of clinical practice in the future. If training is provided by setting the difficulty level of the module according to the general characteristics of the learner and the learner's competency, it can improve learning satisfaction and confidence (Kang, 2020), and have a positive effect on immersion in practice.

As a result of this study, it was confirmed that the core nursing skills performance confidence of nursing students demonstrated a significant positive correlation between practice commitment, and practice commitment had a significant correlation between learning satisfaction. The core nursing skill error reporting program conducted in this study is unreasonable for direct comparison with previous studies as no previous studies have been conducted. However, it was confirmed that there are similar results to previous studies (Kang and Hwang, 2022) that confirmed satisfaction, confidence, and immersion after applying a simulation-based

education module with the same tool as the results of this study. In a previous study by Lee et al. (2017), it was found that the students who participated in a simulation-based education program improved their confidence, satisfaction, problem-solving ability, and clinical performance through the simulated simulation program. Successful nursing performance in the clinical practice of nursing students is very important, and hence, the Core Nursing Error Reporting Program is a very important program. Furthermore, it is considered to be significant in that it verifies the effects of the practice satisfaction, confidence, and immersion of nursing students after applying to the program.

In this study, through the core nursing skills error reporting program of nursing students, it was found that the higher the practice immersion, the more positively affected the core nursing skills performance confidence. In previous studies (Kang and Hwang, 2022; Lee et al., 2017; 2021; Suh, 2012), the positive effect of learning flow was confirmed after applying the simulation-based education module, and it can be seen that it is similar to this study. Accordingly, it is considered that an educational strategy to achieve more effective practice immersion should be prepared by considering the improvement in practice immersion confirmed as a result of the study.

Currently, the core nursing skill error reporting program for nursing students is incomplete. However, this study is significant in that it developed a program for reporting errors in core nursing skills and derived the results of nursing students' engagement in practice, learning satisfaction, and confidence in performing core nursing skills. For the pre-nursing students who will be active as nurses in clinical practice in the future, it would be necessary to conduct repeated education and publicity to strengthen awareness of error prevention and error reporting through the core nursing error reporting program.

5. Conclusion and recommendation

This study is a descriptive research study to identify factors that affect nursing students' core nursing skill error reporting program after development. As a result of this study, it was confirmed that the higher the immersion in practice after applying the core nursing skills error reporting program, the more positive the effect was on the core nursing skill performance confidence.

The programs and studies on reporting errors in core nursing skills targeting nursing students are insufficient. A qualitative study that investigates the perception of nursing students in-depth after applying the program to report errors in core nursing skills of nursing students is needed. Moving forward, when an error is discovered during clinical practice or in the process of implementing core nursing skills as a new nurse, it is recommended that an educational program be developed to help report medical errors, and a study to verify the effect.

Compliance with ethical standards

Ethical considerations

Prior to the data collection, the research subjects, nursing students, were explained how they would be guaranteed anonymity for research purposes, methods, research participation, confidentiality of personal information, and the fact that there is no disadvantage due to consent or refusal to participate, and the collected data will be used only for research purposes. Sufficient explanation was given about the disposal of data after storage for 3 years after the study was completed. Furthermore, it was explained that the freedom of expression of opinions of the research participants was guaranteed and that even if they participated in the research, they could discontinue at any time, and voluntarily written consent was obtained. In particular, it was explained to the subjects of this study that there would be no class loss due to class-related research and that there would be no disadvantages in evaluation and grades, and consent was obtained.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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