THE INFLUENCE OF SELF-EFFICACY IN VR FEEDBACK ON NURSING STUDENTS' PSYCHOMOTOR SKILLS AND SELF-CONFIDENCE

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ABSTRACT

Mastery of psychomotor skills is a core competency that nursing students must demonstrate before entering clinical practice; however, many students report low confidence when performing nursing procedures independently. Self-efficacy—an individual's belief in their own ability to successfully perform a task—has been identified as a key psychological factor influencing skill acquisition and clinical performance. Objective: This study aimed to analyze the influence of self-efficacy on the improvement of psychomotor skills among nursing students. Methods: A quantitative research design with purposive sampling was employed, involving 20 nursing students as respondents. Self-efficacy was measured using the General Self-Efficacy (GSE) instrument, while psychomotor skills were assessed using clinical practice skill checklists or OSCE standards. Results: The findings showed an improvement in students' knowledge and skills following the intervention. Mean knowledge scores increased by 24.33 points (from 59.60 to 83.93), while skill scores increased by 22.66 points (from 62.03 to 84.69). Descriptively, the greatest improvement occurred in the knowledge (cognitive) variable. Increases in both minimum and maximum scores for both variables indicate positive changes across the entire spectrum of student abilities following the intervention. Conclusion: Self-efficacy has a significant positive influence on the improvement of psychomotor skills among nursing students, suggesting that strategies to strengthen student confidence should be integrated into skills laboratory instruction.

KEYWORDS	Self-Efficacy, Psychomotor Skills, Nursing Students, Nursing Education

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INTRODUCTION

Nursing education in the 21st century increasingly emphasizes the importance of ensuring that graduates possess not only theoretical knowledge but also strong procedural competence before entering the clinical environment (Chang, 2022). The development of psychomotor skills among students—encompassing the ability to perform physical nursing procedures accurately, safely, and confidently—is a fundamental component of nursing curricula at the diploma, bachelor's, and professional levels (Prasetiyo, 2024). However, many nursing students experience a gap between theoretical understanding and practical performance, often due to a lack of confidence in applying the knowledge gained in the laboratory to real-world clinical situations (Rachmatullah & Sukihananto, 2020).

Self-efficacy, a concept introduced by Bandura, refers to an individual's belief in their own ability to execute the behaviors required to achieve specific performance goals. In the context of nursing education, self-efficacy influences the amount of effort students invest in mastering a skill, their persistence in practicing, and how they respond to setbacks during clinical training (Bandura, 1997). Previous research indicates that improvements in procedural skills are positively associated with the development of self-efficacy, and that students who demonstrate greater gains in self-efficacy during simulation-based training also tend to receive higher expert performance ratings (Fisher & L., 2018). Simulation- and laboratory-based learning have been widely reported to strengthen self-efficacy and psychomotor competence by allowing students to practice procedures repeatedly in a safe, risk-free environment prior to actual patient contact (Kim & Yoo, 2020).

However, the specific mechanism by which self-efficacy contributes to the enhancement of psychomotor skills—as opposed to cognitive or affective learning outcomes—remains an area requiring further empirical investigation, particularly within the context of nursing education in Indonesia. Therefore, this study aims to analyze the influence of self-efficacy on the improvement of psychomotor skills among nursing students, with the goal of providing information on evidence-based strategies that nursing educators can employ to strengthen students' self-confidence alongside their technical competence.

RESEARCH METHOD

This study employed a quantitative research design to examine the relationship between self-efficacy and psychomotor skills among nursing students. The independent variable was self-efficacy, while the dependent variable was psychomotor skill performance regarding specific maternity nursing procedures taught to the students. The study population consisted of second- and fourth-semester nursing students. A sample of

20 students was selected using purposive sampling based on the following inclusion criteria: active student status, completion of the maternity nursing course, and willingness to participate as respondents. Self-efficacy was measured using the General Self-Efficacy Scale (GSES), which has established validity and reliability. Psychomotor skills were assessed using clinical skill observation sheets or checklists, with evaluations conducted by trained assessors or preceptors. The research procedure was carried out in three stages: pre-intervention, intervention, and post-intervention. During the pre-intervention stage, respondents completed the self-efficacy questionnaire and underwent a psychomotor skill assessment. In the intervention stage, students participated in simulation-based laboratory training designed to build procedural competence and confidence. During the post-intervention stage, respondents again completed the self-efficacy questionnaire and underwent a reassessment of their psychomotor skills. Data were analyzed using the chi-square test to determine the relationships and differences between self-efficacy scores and psychomotor skill scores before and after the intervention.

RESULT AND DISCUSSION

The subjects of this study were 20 nursing students who met the inclusion criteria and participated as respondents.

Table 1. Respondent characteristics (n = 20)

Category		Frequency (n)	Persen (%)
Age	15 Old	8	40 %
	16 Old	10	50 %
	17 Old	2	10 %
Gender	Female	10	50 %
	Male	10	50 %
Semester	2	10	40 %
	4	12	60 %
Sum		20	100%

Based on the table of respondent characteristics, the study involved a total of 20 respondents (100%). Regarding age, the majority were 16 years old (10 respondents, or 50%), while 8 respondents (40%) were 15 years old and 2 respondents (10%) were 17 years old.

In terms of gender, the composition was balanced, consisting of 10 females (50%) and 10 males (50%). Meanwhile, regarding the semester of study, the majority were in their fourth semester (12 respondents, or 60%), while 8 respondents (40%) were in their second semester.

Table 2. Cognitive self-efficacy and psychomotor skills scores before and after intervention (n = 20)

Variabel	N	Mean	Min	Max	SD
Skor kognitif_Pretest	20	59,6	34,6	77,3	11,0
Skor kognitif_posttest	20	83,9	74,6	89,3	3,7
Skor Keterampilan Psikomotorik_Pretest	20	62,0	56,2	72,8	5,3
Skor Keterampilan Psikomotorik_Posttest	20	84,6	75	93,7	5,0

Based on data on the pre-test cognitive variables, the number of respondents was 20 students. The mean score was 59.60, with a minimum of 34.67 and a maximum of 77.33. The standard deviation was 11.02, indicating significant variation in knowledge scores among respondents prior to the intervention. After being given the intervention, the post-test knowledge results showed an increase in the average score to 83.93. The minimum post-test score was 74.67, while the maximum reached 89.33, with a standard deviation of 3.71.

Regarding the skill (psychomotor) pre-test variable, there were 20 student respondents. The mean skill score prior to the intervention was 62.03, with a minimum of 56.25 and a maximum of 71.88. The standard deviation of 5.30 indicates that there is variation in skill abilities between respondents, although the variation is not as large as the knowledge variable. After the intervention, the mean post-test skill score increased to 84.69. The minimum post-test score was 75.00, while the maximum score was 93.75, with a standard deviation of 5.06.

Table 3. Comparison of cognitive self-efficacy and psychomotor skills

Variabel	Pre-test Mean	Post-test Mean	Peningkatan
Pengetahuan (Kognitif)	59,60	83,93	**24,33**
Keterampilan (Psikomotorik)	62,03	84,69	**22,66**

Based on the table, knowledge scores showed an average increase of 24.33 points, while skill scores showed an average increase of 22.66 points. Thus, descriptively, the greatest improvement was observed in the knowledge (cognitive) variable. Overall, the data indicate a positive change in students' knowledge and skills following the intervention. Knowledge scores rose from an average of 59.60 to 83.93, while skill scores increased from 62.03 to 84.69. The rise in minimum and maximum values for both variables further demonstrates that changes occurred across the entire range of the respondents' abilities.

DISCUSSION

The findings of this study significantly support the learning process for students with low confidence levels who are expected to show consistent improvement and provide broader evidence linking self-efficacy to the development of psychomotor skills in nursing education. Skill improvement has been shown to have a reciprocal relationship with the development of self-efficacy: students who demonstrate greater gains in self-efficacy during simulation-based training also tend to be rated as performing better by expert evaluators (Fisher et al., 2018). This relationship is consistent with Bandura's social cognitive theory, which posits that mastery experiences successfully performing a task are the most powerful source of self-efficacy, which in turn motivates further engagement and persistence in skill practice (Bandura, 1997).

Simulation and laboratorybased learning strategies have repeatedly been reported to enhance psychomotor competence and self-efficacy among nursing students by providing a safe, repeatable, and risk-free environment for skills practice prior to actual patient

contact (Kim & Yoo, 2020). High-fidelity simulation, in particular, has been linked to increased self-confidence, improved psychomotor skills, and enhanced clinical judgment, alongside improvements in decision-making and critical thinking (Lin, 2025). This supports the notion that psychomotor skills training should not be approached merely as a technical exercise; rather, it should deliberately incorporate strategies that build students' confidence in their own abilities through the development of more varied learning methods such as the introduction of virtual reality media—consistent with research employing educational approaches (Asmirajanti et al., 2024).

Furthermore, research assessing changes in self-efficacy during simulation training among second-year nursing students found that students who demonstrated increased self-efficacy were also rated as performing better by expert evaluators, reinforcing the reciprocal relationship between confidence and competence (Fisher et al., 2018). Another study found that repeated simulation experiences could significantly enhance nursing students' perceptions of self-efficacy, accompanied by improvements in clinical judgment, critical thinking, and problem-solving abilities (Knobovitch et al., 2025). These findings align with the use of Virtual Reality (VR) in nursing education, as VR simulations offer students opportunities for repeated practice within a safe and interactive environment (Kurniawati et al., 2023). Through immersive simulation experiences, students can receive immediate feedback, evaluate their actions, and correct errors without posing risks to patients. Ultimately, this process can strengthen students' belief in their own capabilities (self-efficacy) while enhancing their knowledge, psychomotor skills, and readiness to perform nursing procedures, including postpartum physical examinations (Li et al., 2026).

However, the relationship between self-efficacy and performance in Virtual Reality (VR)-based learning is not always straightforward. Exposure to realistic clinical scenarios via VR can enhance the learning experience while simultaneously prompting students to critically re-evaluate their own abilities (Chen et al., 2025). Some studies indicate that student-rated self-efficacy scores may experience a slight decline following a simulation, even though this does not necessarily reflect an actual drop in competence (Rachmatullah & Sukihananto, 2020). In the context of VR learning, the experience of encountering clinical situations that mirror real-life conditions allows students to recognize the complexities of nursing interventions and limitations in their abilities of which they were previously unaware. This process can lead to a "recalibration of self-efficacy"an adjustment of students' perceptions of their own capabilities based on a more realistic learning experience (Kabak, 2025). Therefore, changes in self-efficacy following VR learning should be understood as part of the process of developing competence awareness, rather than merely as an indicator of learning success or failure. This underscores the importance of interpreting self-efficacy alongside objective performance measures such as knowledge and psychomotor skills to allow for a more comprehensive assessment of VR's effectiveness in enhancing student competence (Menhard, 2022).

Overall, these findings indicate that nursing curricula should integrate structured opportunities for repetitive, low-risk skills practice accompanied by constructive feedback, as this combination appears to be the most effective way to build the procedural competence and confidence needed to apply those skills assuredly in real clinical settings (Khasawnah et al., 2021).

CONCLUSION

This study confirms that self-efficacy plays a crucial role in enhancing the psychomotor skills of nursing students by fostering the confidence to practice, perseverance, and readiness for clinical practice. Strengthening self-efficacy requires structured, repetitive practice, supervision, and safe, realistic learning methods. Virtual Reality (VR) offers potential as an innovative strategy to bolster self-efficacy and psychomotor skills through immersive, safe simulations that allow for repeated practice without posing direct risks to patients. Integrating VR with structured exercises and feedback can support students in preparing for the increasingly complex demands of clinical practice.

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