

# The Effects of Using Standardized Patients on Nursing Students' Head, Neck and Neurological Examination Skills, Self-Confidence and Satisfaction

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## Abstract

**BACKGROUND/AIMS:** The aim of this study was to examine the effects of standardized patient (SP) practice on students' head, neck and neurological examination skills, satisfaction and self-confidence.

**MATERIALS AND METHODS:** This study was conducted in April and May, 2019 using a comparative design. The sample of this study consisted of 79 students enrolled in the "Assessment of Health" course who agreed to participate. The students were randomly assigned to either two SP simulations (head and neck with a neurological examination) (group 1; n=35) or one SP simulation (just head and neck examination) (group 2; n=44) groups. Data were collected using the "Demographic Data Collection Form for Students", "Skill Evaluation Form (Head and Neck Exam and Neurological Examination)" and "Student Satisfaction and Confidence in Learning Scale."

**RESULTS:** The performance scores obtained by the head, neck and neurological examination of real patients in both groups were significantly higher than those obtained from the SP performances. The self-confidence and satisfaction scores of the group 1 students after performing the head, neck and neurological examinations on real patients were higher than the group 2 students.

**CONCLUSION:** The results of this study showed that SP use was effective in improving students' performance levels in head, neck and neurological examinations. Although the students' self-confidence and satisfaction scores were not statistically significant after the actual patient experience, there was an increase.

**Keywords:** Standardized patient, nursing student, physical assessment, self-confidence, satisfaction

## INTRODUCTION

The basis of the nursing profession is using the nursing process as a problem solving method in order to determine the response to treatment of potential or existing health problems of patients of all ages in the healthcare field. The skills used during the nursing process are necessary for the clinical application of knowledge and theory.

The diagnostic/data collection phase of the nursing process refers to the determination or assessment of the patient's health. Physical examination of the patient plays an important role in collecting diagnostic data.<sup>1</sup>

In order to perform physical examination, nurses must have psychomotor skills, which are a combination of cognitive and motor activities.

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At first, it is recommended that students apply their newly learned physical examination skills on their peers. This can help students gain organization, trust and certain skills before approaching patients. The development of these skills is only gained when it is applied repeatedly. Before practicing nursing skills on real patients in a clinical setting, it is important to perform repetitive studies in skill laboratories during their nursing education.<sup>2</sup> For this reason, the focus nowadays is on new strategies which make teaching in skill laboratories more effective in order to better prepare students for the clinical environment.

In the literature, it has been stated that the use of teaching methods similar to the clinical environment is beneficial in reducing students' stress and increasing their self-confidence, especially in clinical practice.<sup>3,4</sup> For this reason, simulation practice is widely used in nursing education nowadays. The simulation practice in nursing education enables students to handle an incident as if it were a real case and practice educational work in a laboratory environment.<sup>5</sup> Simulation methods are divided into three groups as low, medium or high reality according to the level of reality and difficulty. Body-separated models, basic plastic mannequins, virtual and tactile reality, realistic high-tech interactive patient simulators and standardized patient (SP) practice are among the methods used.<sup>6,7</sup> The SP practice which belongs in the high reality category is used to gain psychomotor skills,<sup>8,9</sup> teach physical examination methods,<sup>10,11</sup> improve students' communication skills,<sup>12,13</sup> increase students' self-confidence,<sup>4,14</sup> and reduce anxiety.<sup>15,16</sup> SPs who were called "programmed patients" in earlier applications and are now called "simulated patients" are individuals trained to describe disease-consistent behaviors.<sup>17,18</sup>

In nursing studies where SP practice is used, it is stated that this practice has significant contributions on the learning process. It has been observed that SP practice improves students' communication skills and increases their self-confidence in particular.<sup>4,12-14</sup> In recent years, the use of simulation in nursing education has become more common in our country. It has been stated in the literature<sup>6,19</sup> that, despite the benefits gained from simulations with high levels of reality, the proficiency and confidence gained by students with simulation training is not the same as the self-confidence and competency gained when they encounter a real patient in the clinic or field.

As reported, simulation is widely used to create a learning environment which contributes to the students' knowledge, skills and self-confidence; however, there is a gap in the transfer of these gains to the clinical setting.<sup>20</sup> The results of this study are hoped to be beneficial on this point. The aim of this study was to examine the effects of SP practice on students' head, neck and neurological examination skills, satisfaction and self-confidence.

### Research Hypotheses

- SP practice increases nursing students' skills in head, neck and neurological examination.
- Repeated SP applications increase the satisfaction of nursing students.
- Repeated SP applications increase the confidence of nursing students.

## MATERIALS AND METHODS

A comparative design was used in this study. This research was carried out during the spring semester of the 2018-2019 academic year in April

and May. The study protocol was approved by the Clinical Research Ethics Committee of the university hospital (approval number: 19.07.2017/451). Written and verbal informed consent was obtained from all students. Verbal consent was obtained from the patients.

### Participants

Students who had one SP experience (head and neck examination) were compared to those who had two SP experiences (head and neck as well as neurological examination) to determine their performances, self-confidence and satisfaction with real patients in a real clinical setting. The sample of this study consisted of 79 students enrolled in the "Assessment of Health" course which aims to teach the physical examination methods to evaluate the body systems of the patient and healthy individual who agreed to participate. Students who volunteered to participate in this study were assigned to the intervention group (head, neck and neurological examination) (group 1; n=35) and the other students were assigned to the control group (just head and neck examination) (group 2; n=44).

Data were collected using the "Demographic Data Collection Form for Students", the "Skill Evaluation Form (Head and Neck Exam and Neurological Examination)", the "Student Evaluation Form for SP" and the "Student Satisfaction and Confidence in Learning Scale."

### Demographic Data Collection Form for Students

The form consisting of 7 questions regarding personal information such as the age, gender, place of residence and the reasons for choosing nursing was created by the researcher.

### Skill Evaluation Form

The skill evaluation forms are revised by the department's academic staff in line with the literature every academic year. The head and neck examination skill evaluation form consists of 19 items, while the neurological examination skill evaluation form consists of 17 items. On these forms, each item is rated as either "0=Step bypassed or wrong application", or "1=Correct application of the step."

### Student Evaluation Form for Standardized Patients

There are 10 statements on this form which was created by scanning the literature.<sup>21,22</sup> SP evaluated the students by responding to these statements as "I agree", "I partially agree" or "I disagree."

### Student Satisfaction and Self Confidence Scale in Learning

This commonly used scale to measure students' attitudes and beliefs about simulations was published by the National League of Nurses.<sup>23</sup> The 13-item scale has two sub-dimensions; "Satisfaction with Learning" and "Self-Confidence" in Learning.

The "Satisfaction with Learning" sub-dimension consists of five items: satisfaction with teaching method, diversity of learning materials, facilitation, motivation, and general suitability of the simulation. The self-confidence sub-dimension has eight sub-items which include self-confidence in scope adequacy, content requirement, skill development, available resources and information on how to get help to solve clinical problems in simulation. Item 13 was coded reversely in the scale. The answer options are 5=strongly agree, 4=agree, 3=undecided-neither agree nor disagree, 2=disagree, 1=strongly disagree.

The participants are asked to mark the number which best expresses their opinions for each item. The score is obtained from the sum of all the items of the scale. The highest possible score is 65, while the lowest possible score is 13. High scores obtained from the scale express high satisfaction and self-confidence. The internal consistency coefficient of the scale was found to be 0.94. The internal consistency coefficient of the Student Satisfaction and Self-Confidence in Learning Scale, which was translated into Turkish by Karaçay and Kaya<sup>24</sup>, is 0.90). In our study, the internal consistency coefficient of the scale was found to be 0.84.

**Procedure**

The application of this study was carried out in six stages (Flowchart 1).

**Theoretical education of students:** Two hours of presentation on head and neck examination and two hours of neurological examination presentation were given to the students by the researcher.

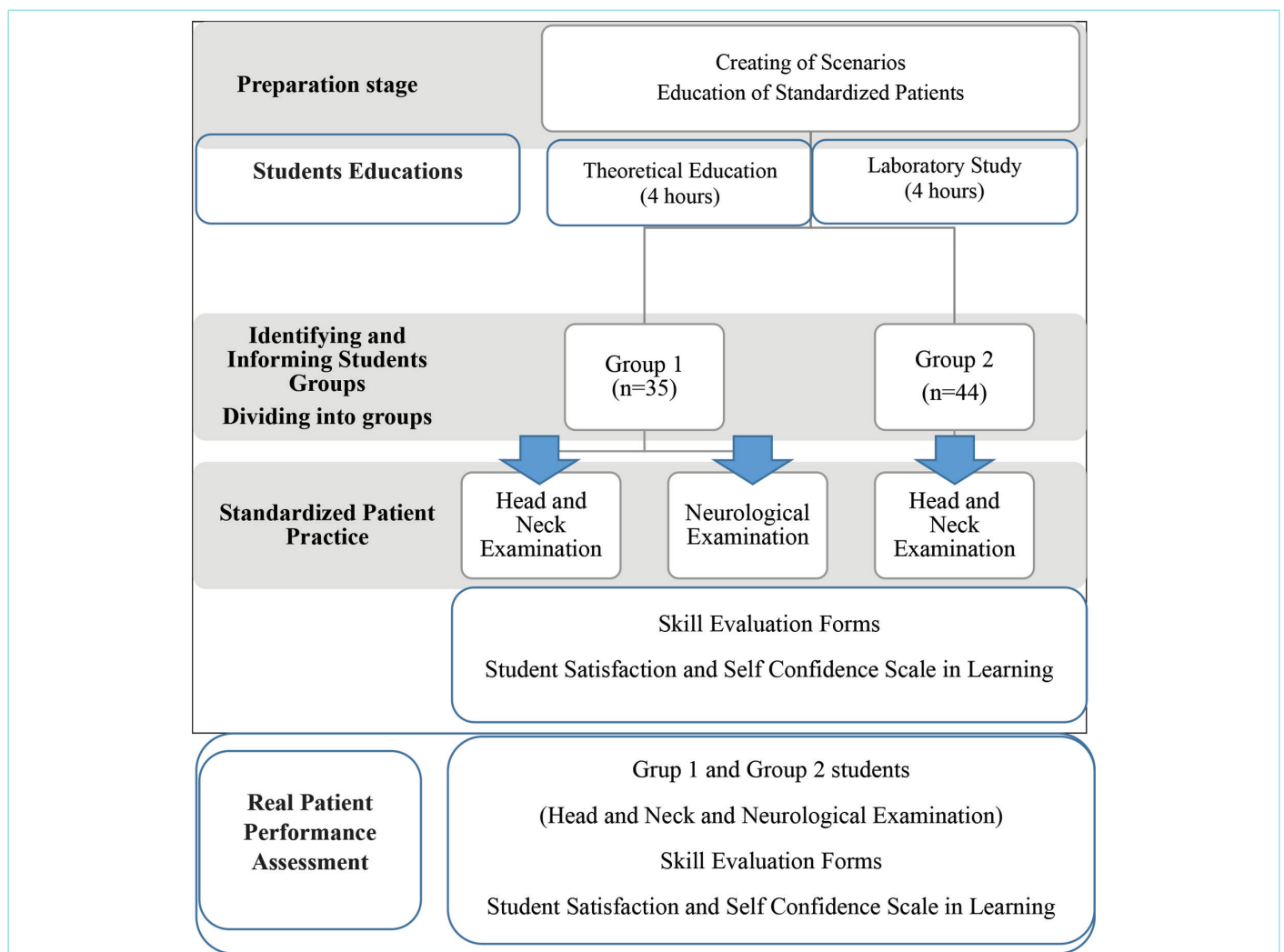
**Faculty information meeting:** Before the laboratory implementation sessions, an informative meeting was held with the faculty members who would perform the sessions. The purpose of the study was explained and the “SP Practice Instructor Guide” was given to the

academic staff in order to ensure consistency. The guide includes the purpose and objectives of the SP simulation, what the instructor should do before the implementation, the SP scenarios, and the laboratory skill checklists.

**Laboratory practice:** Students performed 4-hour laboratory practices on a model or peer in nine groups of 11-12 people under the supervision of faculty members. The laboratory sessions were carried out simultaneously.

**Standardized patient practice student information meeting:** Students were informed about the purpose of this study and how to perform SP practice. In addition, students were informed about the simulation scenario including the duration, patient, the psychomotor skills required, the learning objectives, and the activities which they must complete before the simulation. The students were asked to fill out the “Student Demographic Data Collection Form.”

**Standardized patient practice:** In order to ensure the content validity of the scenarios prepared by the researcher, opinions of one of the course instructors, one of the nursing fundamentals department faculty members and a nurse were received prior to the SP practice.

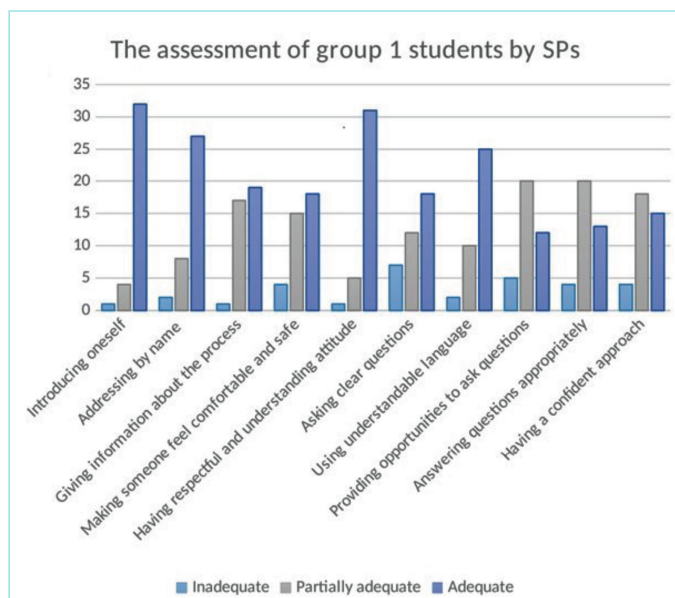


Flowchart 1. Study of flowchart.

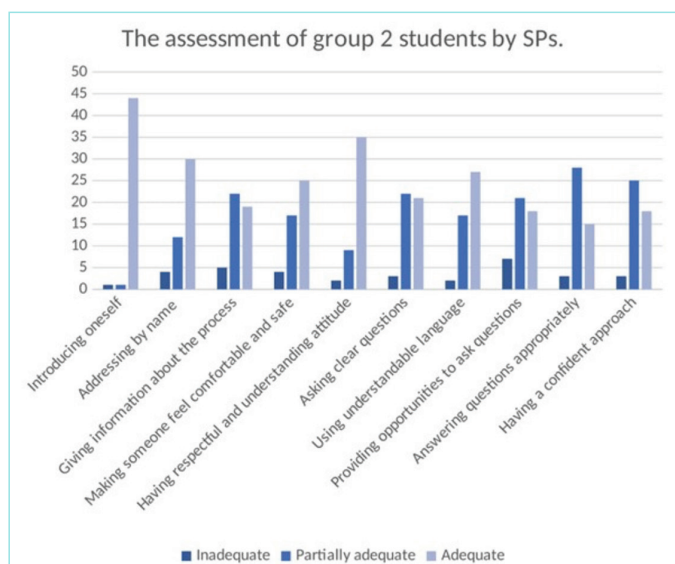
The scenarios were used after the necessary modifications were made in line with their recommendations. The applications were performed with four SPs taken from the SP pool of the faculty of medicine. All SPs were females aged between 40-55 years old. The SP application was performed twice with one week in between the sessions. The SPs received two hours of training on the scenarios two days prior to each application. The SP completed the Student Evaluation Form for SP after each student's performance (Figure 1, 2).

**Standardized Patient Scenarios**

The head and neck examination scenario included the examination of a patient who was hospitalized in the otorhinolaryngology service with



**Figure 1.** The assessment of group 1 students by SPs. SP: Standardized patient.



**Figure 2.** The assessment of group 2 students by SPs. SP: Standardized patient.

complaints of vision loss for a week and pain and hearing loss in the right ear for the purpose of performing advanced examinations.

The neurological examination scenario included the examination of a patient who had been hospitalized for a week with complaints of numbness and loss of sensation on the right hand and face, weakness in the right arm and clouding of consciousness.

The SP practicum took place in the skills laboratories of the faculty of nursing. Group 1 students performed head and neck and also neurological examinations with SP in line with the scenario under instructor supervision in the skills labs with one-week intervals. The students' performances were evaluated using the skill assessment forms. After the practicum, the students filled out the "Student Satisfaction and Self-Confidence Scale in Learning." After the SP application, the students were given feedback about their performances (their thoughts on the SP implementation process, how they felt, how they evaluated their performance, etc.) in groups of 5 to 6 people.

Group 2 students performed only the head and neck examination on the SPs according to the scenario. The student performances were evaluated by the instructor using the skill assessment forms. After the practicum, the students filled out the "Student Satisfaction and Self-Confidence Scale in Learning." The students were given feedback about their performances.

**Clinical performance evaluation:** The students were expected to perform a physical evaluation of the patients for whom they were responsible during the clinical practicum. Each student was responsible for the care of one patient. They carried out the care practices in line with the care plan. The students routinely performed physical examinations of their patients for data collection and diagnosis.

Two weeks after the completion of the SP applications, under the supervision of faculty members, the students performed head and neck and neurological examinations on real patients in a clinical setting using the skill assessment forms. After the practicum, the students were asked to fill out the "Student Satisfaction and Self-Confidence Scale in Learning."

**Statistical Analysis**

Statistical analyses were performed using the SPSS software version 23.0 (IBM SPSS Corp.; Armonk, NY, USA). Descriptive statistical methods (number, percentage, mean, standard deviation) were used while evaluating the data. Parametric tests were used for statistical evaluations since the assumption of normal distribution was provided in the analysis of the data. The independent sample t-test was used to compare the quantitative means of two groups. For the dependent measurements, the dependent sample t-test was used for two measurements, and the Friedman test was used for three replicates. The Cronbach's alpha coefficient was calculated for the reliability of the scale.

The performances of the group 2 students who had one SP application and the group 1 students who had two SP applications on real a patient in the clinic were compared using the t-test. The students' performance scores were converted to percentage values. The students' scores on the Self-Satisfaction and Confidence in Learning Scale were compared by t-test.

## RESULTS

The vast majority of students (88.6%) were women. The mean age of the group 1 students was 19.17±1.04 years and for the group 2 students, it was 17.77±0.83 years.

The data obtained from this study are presented under sections of the students' SP performances, performance in clinical practice, and self-confidence and satisfaction.

### Students' Standardized Patient Performances

The first SP performance scores of the students in group 1 for head and neck examination were 59.70±19.48 and for group 2, they were 64.71±15.08. When the mean scores were examined, it was seen that the performance scores of the group 2 students were higher than those of the experimental group students. No statistically significant difference was found (p=0.201, p>0.05) (Table 1).

Although the difference between the 1<sup>st</sup> and 2<sup>nd</sup> SP performances of the group 1 students was not statistically significant, the second SP (neurological examination) performance scores (66.72±14.75) were higher than the head and neck examination performance scores (Table 1).

### Clinical Application Performances

There was a significant difference (p=0.001) between the head and neck examination skill performance scores of the group 1 students on the SP (59.70±19.48) and on the real patients (84.66±12.79). Comparison of the head and neck examination performance scores (group 1= 84.66±12.79; group 2= 72.85±13.04) for group 1 and group 2 students on the real patient was performed with the t-test. The difference was significant (p=0.001). The performance scores obtained by the head and neck examination of the real patients in both groups were significantly

higher than those obtained from standard post-patient performances (Table 1).

There was a significant difference between the clinical setting neurological examination performance scores of the group 1 students (82.35±12.11) who carried out neurological examination with the SP and the group 2 students (67.38±15.40) who did not have SP experience (p=0.001) (Table 1).

### Self Confidence and Satisfaction Scores

Self-confidence and satisfaction scores after the head and neck examination of the group 1 students (48.37±5.11) were lower than the group 2 students (49.52±6.47). This difference was not statistically significant (p=0.392) (Table 2).

The self-confidence and satisfaction scores of the group 1 students after performing head and neck and neurological examinations on real patients (49.91±2.79) were higher than the group 2 students (48.34±5.55). This difference was not statistically significant (p=0.106) (Table 2).

When the clinical satisfaction scores of the group 1 and group 2 students were examined, it was determined that there was a difference (Table 2). It was determined that the total scores of the group 2 students were higher than those of the group 1 students (Table 2).

### Standardized Patients' Views on Student Performance

Figure 1, 2 show the SPs' assessments of the group 1 and group 2 students during their head and neck examination according to the assessment criteria. 86.5% of the group 1 students and 95.7% of the group 2 students introduced themselves to the SP and the majority addressed the patient by name. More than half of the students (group 1= 67.6%; group 2= 58.7%) used a language that the patient could understand. Both groups

**Table 1. Comparison of mean scores of students' performance on skills**

Skill Evaluation Form	Group 1 (n=35)	Group 2 (n=44)	p
	Mean ± SD	Mean ± SD	
SP head and neck skill	59.70±19.48	64.71±15.08	0.201
Clinical head and neck skill	84.66±12.79	72.85±13.04	<0.001
Clinical neurological skill	82.35±12.11	67.38±15.40	<0.001

P<0.05, independent t-test, SD: Standard deviation, SP: Standardized patient.

**Table 2. Comparison of mean scores of students' satisfaction and Self Confidence Scale in learning**

	Grup 1 (n=35)	Grup 2 (n=44)	p
	Mean ± SD	Mean ± SD	
<b>SP application</b>			
Satisfaction	19.17±2.96	20.18±2.96	0.136
Self-confidence	28.83±2.96	29.34±4.03	0.531
Satisfaction and self-confidence	48.37±5.11	49.52±6.47	0.392
<b>Clinical application</b>			
	Mean ± SD	Mean ± SD	p
Satisfaction	20.17±1.65	19.14±2.83	0.046*
Self-confidence	29.83±1.73	29.20±3.22	0.275
Satisfaction and self-confidence	49.91±2.79	48.34±5.55	0.106

P<0.05, independent t-test, SP: Standardized patient, SD: Standard deviation.

had similar ratios in asking questions to the patient, giving the patient the opportunity to ask questions and answering their questions but with less than half of the students achieving this adequately. 48.6% of the group 1 students and 39.1% of the group 2 students had a safe approach during implementation.

## DISCUSSION

The results of our study showed that the use of SPs improved the head, neck and neurological examination skill performances of the undergraduate nursing students. In addition, it is possible to say that more applications with SPs before experience with a real patient contributes significantly to the students' skills performance.

In one study aiming to compare the effects of using high-fidelity simulators and SPs measuring the levels of knowledge and skills related to thorax, lung and cardiac examinations, using SPs was shown to be effective in improving the knowledge levels of undergraduate nursing students.<sup>10</sup> In another study conducted to evaluate the effectiveness of SPs in developing the health assessment skills of first year nursing students, it was found that the performance scores of students who had worked with SPs were significantly higher than those who had not.<sup>8</sup> In their study, Slater et al.<sup>11</sup> evaluated whether there was a difference between peer education and SP training for physical examination skills. The students stated that the SP was much more realistic than practicing on their peers and that they were more comfortable doing physical examinations. In addition, the students stated that they were satisfied with the reality of the scenario and the feedback of the patients. Luctkar-Flude et al.<sup>25</sup> investigated SP, high-fidelity human simulator and community volunteer methods in the development of physical examination skills. At the end of their study, it was seen that practice with SPs had improved communication skills but that the high fidelity human simulator was more useful for respiratory evaluation.

There are studies emphasizing the positive effects of SP use on nursing students' physical examination skills as well as their nursing skills related to different practices. In a study by Yoo and Yoo<sup>12</sup>, students performed oral care, back care, positioning, nasogastric catheter and glycerin enema applications with the aid of SP practice. As a result of these applications, when the psychomotor skills of the students were measured by checking skill lists, the students obtained higher scores. In addition to the development of the students' psychomotor skills, an increase in communication and clinical reasoning skills was also observed. Sarmasoglu et al.<sup>9</sup> conducted a study where students performed arterial blood pressure measurement and subcutaneous drug administration with SPs. At the end of their study, it was determined that the students working with SPs had developed their psychomotor skills. In the same study, a student stated the benefit of SP practice to clinical learning as follows; "I had the opportunity to see my mistakes so that I will be more experienced in the clinic." In our study, the clinical performance scores of the students who experienced head, neck and neurological examination skills on SPs saw a significant increase. Liaw et al.<sup>26</sup> stated that frequent applications of simulations with SPs allow the students to prepare for similar cases during real nursing practices.

DeMaria et al.<sup>27</sup> reported that SP applications were considered as additional stress by the participants of the SP group, and that they felt students were more ready to perform similar tasks in real-life settings because they had had this more stressful experience. It is thought that

the significantly higher performance scores of the group 1 students who practiced with SPs repeatedly before performing head, neck and neurological examinations with real patients were related to the fact that they felt more prepared for these applications.

Although there was a significant increase in the skill performance scores of the students in our study, there was no difference between the groups in terms of their self-confidence and satisfaction. The ultimate source of self-efficacy beliefs are physiological and emotional states, such as feelings of anxiety. Individuals can assume that their physiological status in a stressful situation indicates a probability of failure. Our students practiced for the first time with SPs and real patients in a clinical setting, both of whom constituted a stress factor for them. Therefore, this stress may have led to a lack of self-confidence in the students.

The complexity and unpredictability of real patients in real clinical settings makes it difficult to make the simulated experiences truly authentic.<sup>6</sup> Pike and O'Donnell<sup>28</sup> stated that clinical simulation can increase the student's self-efficacy in performing skills in a simulated environment, however, since this does not happen while practicing skills in the clinical setting, it therefore can potentially produce a sense of false efficiency. Moreover, it is important to have these experiences to be as realistic as possible in order to improve the learning process.<sup>29</sup> Although the necessary conditions were provided for creating a real clinical environment in our study and the scenarios reflected real situations, it is thought that the stress/anxiety experienced by the student negatively affects their self-confidence. There are studies showing that students had anxiety and stress for every application (laboratory or clinical) which they perform.<sup>30,31</sup> Similarly, Mun<sup>32</sup> reported that students were concerned about what to say to patients in clinical practice and that this was related to their lack of knowledge and experience. At this point, it was thought that since the students were inexperienced and in their first year of schooling, this was reflected in their scores. In addition, the students' perception that they were being evaluated by their mentors during the physical examinations on the real patients may have caused them to focus only on the steps of the application and so to lack self-confidence.

Bandura<sup>33</sup> described the effective mastery of experiences as the most effective sources of information on which self-efficacy beliefs are built. Yong-Shian et al.<sup>4</sup> conducted a study to determine the changes in the satisfaction and self-confidence levels of students using SP practice with or without psychiatric patient care experience. The satisfaction and self-confidence of those students who had previously had care experience with psychiatric patients were found to be significantly higher than for those students without any care experience. As a result of that study, the students stated that they were satisfied with the SP application and "SP application helped them learn and the application motivated them."

In a study by Pike and O'Donnell<sup>28</sup>, students expressed a lack of confidence in communication skills categorized as "non-technical skills." Students defined their communication skills as an area of concern and stated that they were very focused on psychomotor aspects. In our study, the application may have focused on psychomotor skills due to the nature of the scenario. The SPs statements about the students being focused more on the process supports this finding. The SPs also stated that the students exhibited a respectful and understanding attitude towards them. However, the students did not give sufficient opportunities to the SPs to ask questions and they did not answer their questions during the

application. This result shows that students were not at the desired level regarding their communication skills. The SPs stated that the students did not have sufficient skills in safely approaching them.

In conclusion, SP practice was shown to be an effective method for developing student skills and applying these improved skills on real patients in real clinical settings. Although there were increases in the self-confidence and satisfaction of students, they were not significant. Different studies have stated that<sup>4,12,13,14,34,35</sup> the SP experience has positive effects on students' self-confidence and satisfaction. Ignacio et al.<sup>19</sup> stated that since the results are obtained from studies conducted in simulated environments, any findings may not be similar to those which are investigated in real clinical settings. We believe that our results should be evaluated in real clinical setting considering performance and self-confidence and satisfaction limitations.

### Study Limitations

Since our study was conducted in a single nursing school, our results cannot be generalized. Another limitation is that the SP sessions were conducted with four faculty members in addition to the researcher. These faculty members conducted physical examination laboratories and SP sessions related to different applications on other occasions; however, not all variables which may have affected the SP sessions were controlled. On a different note, the students' feelings of being evaluated may have negatively affected their self-confidence. Despite the fact that the students were informed during the information session that the SP practices would not be part of their course evaluation, performing these applications under the supervision of an educator may have caused stress to the students. This stress factor could not be controlled. Therefore, the students' stress levels in the clinical setting should be considered while evaluating their learning outcomes (self-confidence, skills, critical thinking, etc.). Another limitation of this study can be said to be the use of a single teaching method (SP). It is recommended to plan studies in which different methods can be compared. In addition, due to time constraints in this study, a comparison of two SP applications with a single SP practice was made. It is important to interpret our results in light of this. In order to evaluate the effects of repeated SP practice, it is recommended to increase the number of applications in future studies.

### CONCLUSION

The results of this study showed that SP use was effective in improving students' performance levels in head, neck and neurological examinations. In addition, it was determined that experiencing more SPs before performing these applications with real patients significantly contributed to the students' performances. Although the students' self-confidence and satisfaction scores were not statistically significant after the actual patient experience, there was an increase.

SP practice and all other clinical simulation types should not be limited to psycho-motor skills, but also include a number of other skills, such as interpersonal, communication and decision-making skills. It is recommended that studies to determine the effectiveness of SP practices on self-confidence be carried out with students in higher classes.

### MAIN POINTS

- The use of standardized patients helped students prepare for the clinical setting.

- The use of standardized patients improved the physical examination skill performances of the undergraduate nursing students.
- Recurrent applications with standardized patients before experience with real patients contributed significantly to the students' skills performance.

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### ETHICS

**Ethics Committee Approval:** The study protocol was approved by the Clinical Research Ethics Committee of the university hospital (approval number: 19.07.2017/451).

**Informed Consent:** Written and verbal informed consent was obtained from all students.

### DISCLOSURES

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