THE EFFECT OF IMAGERY TECHNIQUE ON SELF - EFFECTIVENESS – EFFICACY AND ANXIETY LEVELS OF NURSING STUDENTS

İmgeleme Tekniğinin Hemşirelik Öğrencilerinin Öz Yeterlilik - Yeterlilik ve Kaygı Düzeylerine Etkisi

Betul KUS[1], Ozlem SAHIN AKBOGA[1], Gulay YILMAZ[1]

[1]Department of Nursing, Faculty of Health Sciences, Yozgat Bozok University, Yozgat, Türkiye

Betul KUS, Dr. Öğr. Ü.
(0000-0001-7828-2050)
Ozlem SAHIN AKBOGA, Öğr. Gör.
(0000-0002-6767-4195)
Gulay YILMAZ, Dr. Öğr. Ü.
(0000-0002-1386-9018)

İletişim:

Dr. Öğr. Ü. Betul KUS
Department of Nursing, Faculty of Health Sciences, Yozgat Bozok University, Yozgat, Türkiye.

ABSTRACT

Objective: To determine the effect of the imagery technique used in the Nursing Fundamentals course on the self-effectiveness–efficacy and anxiety levels of students.

Material and Methods: This study was designed as a randomized controlled trial. The research was completed with a total of 85 students, 40 of whom were in the intervention group and 45 in the control group. The imagery technique was applied to the intervention group once a week for 4 weeks before the laboratory practice lesson. This study are self-efficacy-sufficiecy and state and trait anxiety levels obtained from the questionnaire before and after the application.

Results: While there was no difference in the mean scores of self-efficacy-sufficiecy and trait anxiety of the students before and after the application of the imagery technique (p=0.515, p=0.456), it was determined that the mean score of state anxiety of the students in the intervention group decreased significantly after the application (p=0.044).

Conclusion: Academic nurses should work on increasing self-efficacy and reducing the level of trait anxiety, in addition to the supportive imagery technique during training.

Keywords: Anxiety; Imagery; Nursing; Student; Self - Efficacy - Sufficiecy

ÖZET

Amaç: Hemşirelik Esasları dersi laboratuvar uygulamasında kullanılan imgeleme tekniğinin hemşirelik bölümü ikinci sınıf öğrencilerinin öz etkililik-yeterlik ve anksiyete düzeyine etkisini belirlemektir.

Gereç ve Yöntemler: Bu araştırma, müdahale (40 öğrenci) ve kontrol gruplu (45 öğrenci), ön-test ve son-test uygulamalı, randomize kontrollü çalışma olarak tasarlandı. Veriler, "Kişisel Bilgi Formu" ve "Öz Etkililik-Yeterlik Ölçeği, Durumluk ve Sürekli Kaygı Ölçeği" ile toplandı.

Bulgular: İmgeleme tekniği uygulaması sonrası öğrencilerin öz etkililik-yeterlik ile sürekli kaygı puan ortalamaları açısından gruplar arasında farklılık saptanmadı (p=0,515, p=0,456). İmgeleme tekniği uygulaması sonrasında ise öğrencilerin durumluk kaygı puan ortalamaları incelendiğinde gruplar arasında farklılık olduğu ve bu farkın istatiksel olarak anlamlı olduğu saptandı (p<0,05).

Sonuç: Uzun süren psikomotor beceri öğretiminde yaşanan kaygı, hemşirelik öğrencilerinin öğrenme düzeyini ve performansı etkilemektedir. Akademisyen hemşireler, hemşirelik öğrencisinin yaşadığı kaygının farkında olmalıdır. Öz etkililiği-yeterliliği arttırmak ve sürekli kaygı düzeyini azaltmak için destekleyici tekniklere yönelik çalışmalar yapılmalıdır.

Anahtar Kelimeler: Kaygı; İmgeleme; Hemşirelik; Öğrenci; Öz Etkililik; Yeterlilik

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INTRODUCTION

Nursing is a profession that deals with all kinds of care, treatment and rehabilitation services of healthy/ sick individuals and their families. Nurses have comprehensive roles within the healthcare system, and they can identify various physical, psychological and social problems in the groups they serve (1). To overcome these problems, nurses need to be prepared during their education and supported in their working life.

During their education, nurses undergo a challenging process of theory and skill applications (2-4).

Besides their general concerns about life, this process is another stressor for the nursing students. They are expected to acquire, develop and use high-level skills such as communication, observation, situation-specific care, critical thinking, problem solving, critical decision making, emergency response and coping with stress. Nursing skills are gained through practice, trial and experience. Many of these skills should be acquired by nurses during their education. However, studies have shown that nursing students face many problems while developing their clinical skills. It has been found that people (such as nurses/educators/patients/ patient relatives), educational environment, personal characteristics of the students, quality of education and students' perceptions of clinical learning are effective in acquiring the clinical skills (5). However, nursing students face many issues such as feeling inadequate, having anxiety about making mistakes, insufficient focus, decrease in clinical performance, decrease in professional values, exposure to stressors in clinical settings, burnout, difficulty in coping, difficulty in combining theoretical knowledge with practical skills and lack of clinical support (6-10). It has been found that nursing students experience above-average stress. Furthermore, academic and practice stress levels have been found to be associated with professional development and professional satisfaction (11). A similar relationship has also been found between the following: educational programmes and self-confidence and anxiety, healthy life behaviours and self-efficacy, self-efficacy, hope and learned resourcefulness, emotional intelligence, clinical communication and self-efficacy, and well-being and self-efficacy (12-16). In this context, individuals with self-efficacy and self-effectiveness believe that they can create change in various events in life, cope with events effectively, initiate the necessary actions to bring about change and obtain positive results from these actions. Nursing education includes hands-on learning experiences. Therefore, students need to develop self-effectiveness–efficacy so that they can create a roadmap during nursing education and use cognitive strategies correctly during skill training (17). Such an approach will help reduce perceived anxiety during acquiring and developing new skills.

Many methods can be used when teaching a new professional skill and when supporting individuals in newly encountered and difficult situations. One of these methods is imagery. Imagination is linked to human creativity. Imagery is how we animate and design an object, situation and/or entity by redefining it and concretising it in our minds. In other words, imagery is the ability to create an idea or image in our minds (18). Imagery supports the development of physical skills as well as mental skills. In terms of ease of use, imagery can be applied at any point of time by a group or an individual in various contexts, such as lessons, sports, home–school–work environment and illness, to increase motivation, change behaviour and strengthen areas of shortcoming (19). Imagery contributes positively to increasing concentration, building self-confidence, improving learning skills, changing behaviour, controlling emotional reactions, success, learning and developing the ability to make the right decision, teamwork and cooperation (20). No studies in the literature have applied the imagery technique on nursing students to increase self-effectiveness and efficacy and decrease stress.

Nursing students need to be prepared and supported to tackle problems they will likely experience in the future. With this in mind, this research was conducted to determine the effect of imagery technique applied in practical courses on the self-effectiveness–efficacy and anxiety levels of the nursing students.

Research Hypotheses: H1: Imagery technique is effective in increasing the students' self-effectiveness–efficacy levels.

H2: Imagery technique is effective in reducing the anxiety level of the students.

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MATERIALS AND METHODS

This research was designed as a randomised controlled experimental study. The research included intervention (45 students) and control (45 students) groups, and a pre-test and post-test were applied.

The research population consisted of 90 second-year nursing students taking the 'Fundamentals of Nursing' course. Sample selection was not performed, and all students voluntarily participated in the study. In this study, 45 students were included in the intervention group and 45 students were included in the control group. In the intervention group, five students left the study because of insufficient participation in interventions. The study was completed with 40 students in the intervention group and 45 students in the control group (n = 85) (Figure 1).

The research was conducted between February 2021 and May 2022 with second-year students in the Nursing Department of the Faculty of Health Sciences of a state university in Türkiye. All students were taking the 'Fundamentals of Nursing' course. The course consisted of 6 hours of theory and 12 hours of practice, of which 8 hours of professional skill practices were performed in a clinical setting and the remaining 4 hours in a practice laboratory. In the skill practice laboratory, the students practised in groups of 8–12 covering the theoretical topic of the week. During this time, an instructor accompanied the students and demonstrated the application. The students were then asked to repeat the application until they could perform it without mistakes. In the fall semester of the 2021–2022 academic year, the 'Fundamentals of Nursing' course consisted of 6 hours of theoretical lectures on Wednesday, 8 hours of clinical practice on Thursday and 4 hours of laboratory practice on Friday. To avoid bias and ensure homogeneity, male:female ratio was kept as close as possible between the groups and the students were assigned to groups by tossing a coin according to sex.

The students were informed about the purpose and scope of the study and the intervention. Students who volunteered to participate in the study were randomised into groups. Afterwards, 'Personal Information Form', 'Self-Effectiveness–Efficacy Scale' and 'State–Trait Anxiety Inventory' were distributed to all students as the pre-test.

Intervention group: The imagery technique was applied to the students in this group on the day of the laboratory practice, before the lesson, once a week for 4 weeks. The laboratory practice consisted of 6 weeks. Pre-test was performed on the first week, followed by 4 weeks of imagery technique, and the pre-test was performed on the final week. In each application of the imagery technique, four scenarios that could be encountered in clinical practice that required skill practice were used for 30 minutes (Table 1). The imagery technique was applied by the author who had expertise and training in nursing and imagery technique. The stages of the imagery technique included preparation of a suitable environment, preparation of the students, setting the background music (ney sound), relaxation, focusing on the technique, visualising the situation to be imagined, loading positive and constructive expressions on the individual, distracting the student from the imagined situation, relaxation and ending the session.

Control group: No intervention was performed on the students in this group. After the post-test, students in the control group were shown a video on imagery technique so that they would not feel excluded and less competent and also to reduce the possible bias among the students.

The data were collected twice, before and after the application of the imagery technique, using the 'Personal Information Form' prepared by the researchers in line with the relevant literature, 'Self-Effectiveness–Efficacy Scale'and 'State and Trait Anxiety Inventory'. (5, 13, 14, 21-24).

Personal Information Form: This form consisted of eight questions on age, sex, satisfaction with nursing, adequacy of training applications and causes of anxiety (5, 13, 14).

Self-Effectiveness–Efficacy Scale (SEES): SEES was developed by Sherer et al. and adapted to Turkish by Gözüm and Aksayan (21, 22). SEES is a 5-point Likert-type self-assessment scale that consists of 23 items (1=Does not describe me at all, 2=Describes me a little, 3=I am undecided, 4=Describes me well, 5=Describes me very well). SEES has four sub-dimensions: Initiating the behaviour (items 2, 11, 12, 14, 17, 18, 20 and 22), maintaining the behaviour (items 4, 5, 6, 7, 10, 16 and 19), completing the behaviour (CB, items 3, 8, 9, 15 and 23) and coping with obstacles

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Figure 1. Flowchart of the randomized controlled trial
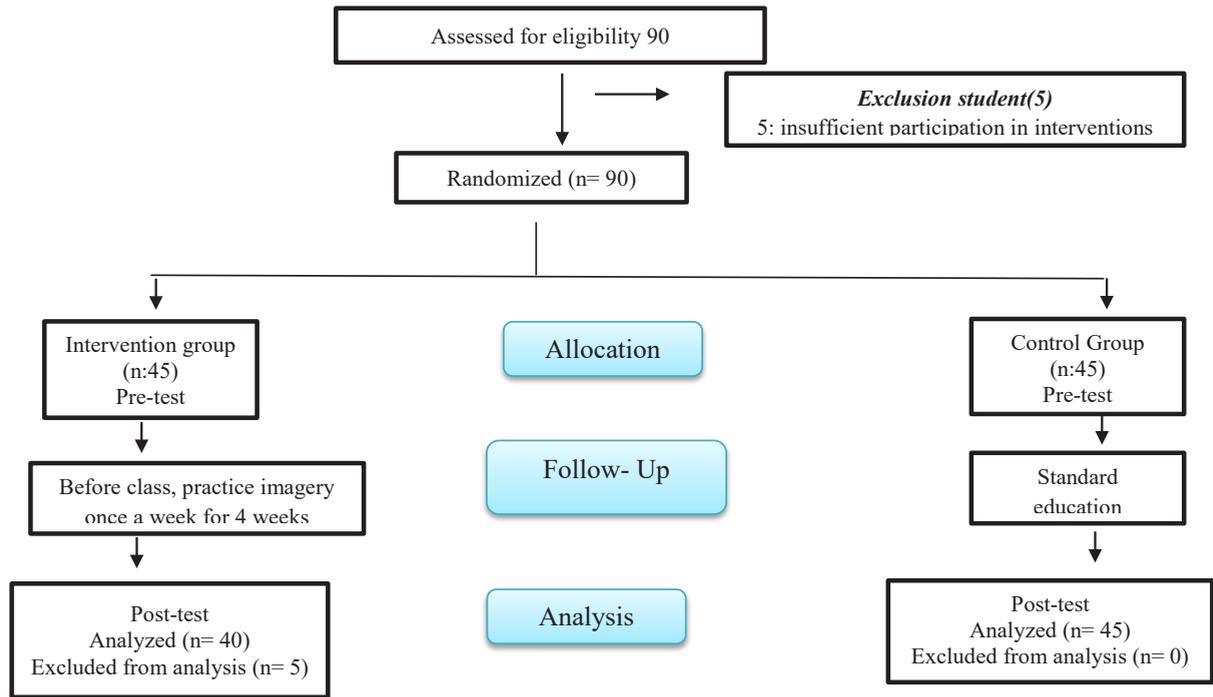
Table 1. Imagery Technique Session Topics

Number of Sessions	Session Topic	Session Content
1st session	Patient admission and measurement of vitals	The student initiates first communication with the patient and/or healthy individual, introduces himself/herself, meets the patient and performs the measurement of vitals by explaining it the individual.
2nd session	Caring for a bedridden individual	The student gives information to a bedridden individual, explains something/interviews the individual while empathising with them and provides nursing care specific to the bedridden individual.
3rd session	Interviewing an individual who is anxious due to respiratory distress and providing nursing care	The student becomes aware of the anxiety experienced by the individual suffering from respiratory distress due to chronic obstructive pulmonary disease, communicates with the patient and provides nursing care for respiratory distress.
4th session	Providing nursing care to an individual with pain	The student evaluates the pain of the patient, prepares the treatment, informs the individual about pain and treatment, applies the treatment for pain and provides nursing care.

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(CO, items 1, 13 and 21). Items 2, 4, 5, 6, 7, 10, 11, 12, 14, 16, 17, 18, 20 and 22 are scored in reverse. A minimum of 23 and a maximum of 115 points can be obtained from the scale. A high total score indicates that the individual's self-effectiveness–efficacy perception is at a good level. The Cronbach's alpha value of the scale was 0.81 in the original study (21, 22). In the present research, the value was found to be 0.84 and 0.85 before and after the application, respectively.

State–Trait Anxiety Inventory (STAI): STAI was developed by Spielberger et al. and adapted to Turkish by Öner and Le Compte (25). STAI consists of 40 items and two sub-dimensions: state anxiety (items 1–20) and trait anxiety level (items 21–40). While the State Anxiety Inventory determines how the individual feels at a certain moment and under certain conditions, the Trait Anxiety Inventory determines how the individual generally feels. Both sub-dimensions are 4-point Likert-type scales. State Anxiety Inventory is scored according to the severity of experiences, as follows: 1=not at all, 2=somewhat, 3=moderately so and 4=very much so. Trait Anxiety Inventory, on the other hand, is scored according to the frequency of experiences, as follows: 1=almost never, 2=sometimes, 3=often and 4=almost always. Furthermore, 10 items (items 1, 2, 5, 8, 10, 11, 15, 16, 19 and 20) of the State Anxiety Inventory and 7 items (items 21, 26, 27, 30, 33, 36 and 39) of the Trait Anxiety Inventory are scored in reverse. The score that can be obtained from both scales ranges between 20 and 80. Higher scores indicate higher level of anxiety. The internal reliability coefficient of State Anxiety Inventory is between 0.94 and 0.96, while that of Trait Anxiety Inventory is between 0.83 and 0.87 (23, 24). In the present research, the Cronbach alpha value was found to be 0.92 and 0.89 for the State Anxiety Inventory before and after the application, respectively, and 0.81 for the Trait Anxiety Inventory before as well as after the application.

Data were analyzed using statistics software (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0 Armonk, NY: IBM Corp). While evaluating the study data, the normal distribution of the data of numerical variables was evaluated with the Shapiro Wilk test of normality, as well as descriptive statistical methods (ratio, mean, standard deviation, median). Chi-square test was used to compare groups according to gender, and Mann-Whitney U test was used to compare groups according to age. Two-way analysis of variance was used in repeated measurements in the comparison of pretest-posttest scale scores between and within groups. Bonferroni correction was applied for multiple comparisons in two-way analysis of variance in repeated measures. The results were evaluated at the 95% confidence interval and the significance level was $p<0.05$. Institutional permission was obtained from the relevant health sciences faculty to conduct the study (Date: 11.11.2020). Ethical approval was obtained from the local ethics committee (Date: 11.11.2020 Decision No: 2017-KAEK-189_2020.11.11_03). Written consent was obtained from all participants in the study. The research was conducted in accordance with the Declaration of Helsinki.

RESULTS

As shown in Table 2, 70.5% of the participants were women and the mean age was 19.89 ± 1.41 years. No significant difference was found between the groups in terms of age and sex ($\chi^2=0.202$ p=0.653, t=1.555 p=0.538). The groups were similar in terms of descriptive characteristics (Table 2).

The mean SEES scores of the students in the intervention and control groups were 86.93 ± 13.18 and 88.93 ± 12.07, respectively, while the mean SEES scores of the students in the intervention and control groups after the application were 86.06 ± 12.18 and 88.15 ± 12.93, respectively. Accordingly, no significant difference was found between the SEES scores of the groups before and after the application (p=0.472, p=0.515). Furthermore, no significant difference was found in the intra-group comparisons before and after the application (p=0.788 for the intervention group, and p=0.272 for the control group) (Table 3).

The mean state anxiety scores of the intervention and control group were 40.09 ± 11.72 and 40.2 ± 11.87, respectively, while the mean trait anxiety scores were 45.16 ± 9.97 and 44.73 ± 12.57, respectively. No significant difference was found between the state and trait anxiety scores before the application (p=0.933, p=0.996), and the anxiety level of the students before the application was moderate.

After the application, the mean state anxiety scores

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of the intervention and control groups were found to be 37.53 ± 9.28 and 41.75 ± 9.74, respectively. A statistically significant difference was found between the groups (p=0.044). In addition, no significant difference was found in the intra-group comparison of the state anxiety scores between the intervention and control groups (p=0.384, p=0.472).

After the application, the mean trait anxiety scores of the intervention and control groups were 41.33 ± 9.32 and 42.7 ± 7.21, respectively. No significant difference was found between the groups (p=0.456). In addition, no significant difference was found in the intra-group comparison of the trait anxiety scores between the intervention and control groups (p=0.216, p=0.367) (Table 4).

DISCUSSION

This research was conducted to determine the effect of the imagery technique on the nursing students' self-effectiveness–efficacy and anxiety levels during skill teaching. The results showed that the students in the intervention and control groups had similar characteristics and that there was no significant difference between the groups (Table 1). Other studies using the imagery technique also reported descriptive characteristics similar to this results (25).

Self-effectiveness–efficacy is the perception of being able to complete an action successfully and being in control (26). The active participation of nursing students who are acquiring cognitive, psychomotor and affective skills in education and regular and systematic practice increase the level of success and self-efficacy (27,28).

High self-effectiveness–efficacy levels positively contribute to learning skills. In a previous study, it was determined that the clinical skill development of the students depended on their self-efficacy levels and that the students with high self-efficacy levels were very much successful in learning clinical skills (29). In this research, it was determined that the students in the intervention group had self-effectiveness–efficacy scores of 86.93 ± 13.18 before the application and 86.06 ± 12.18 after the application. Similarly, the students in the control group had self-effectiveness–efficacy scores of 88.93 ± 12.07 before the application and 88.15 ± 12.93 after the application (p>0.05). In parallel with

Table 2. Descriptive Characteristics of the Students (n: 85)

Characteristics		Intervention group (n: 40)	Control group (n: 45)	Test statistic	p
Sex					
Female	n (%)	31 (68.2)	29 (75.0)	: 0.202	0.653
Male	n (%)	14 (31.8)	11 (25.0)		
Age (years)	x ± SD	19.66 ± 1.31	20.15 ± 1.49	U: 1.555	0.538
	Median (min–max)	20 (18–27)	20 (19–28)		

χ^2 : Chi square, U: Mann–Whitney U test, x ± SD: Arithmetic mean ± standard deviation

Table 3. Comparison of Self-Effectiveness–Efficacy Levels Between the Intervention and Control Groups (n: 85)

Self-effectiveness–efficacy total score		Intervention group	Control group	Test statistic [a]	p
Pre-test	x ± SD	86.93 ± 13.18	88.93 ± 12.07	0.723	0.472
	Median (min–max)	90 (48–110)	89 (56–114)		
Post-test	x ± SD	86.06 ± 12.18	88.15 ± 12.93	0.339	0.515
	Median (min–max)	92 (57–110)	89.5 (60–110)		
	Test statistic [b]	t: 0.270	t: −1.112		
	p	0.788	0.272		

a Independent samples t-test b Paired-samples t-test, x ± SD: Arithmetic mean ± standard deviation

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Table 4. Comparison of Anxiety Levels Between the Intervention and Control Groups (n: 85)

Anxiety score		Intervention group	Control group	Test statistic	p
State anxiety score					
Pre-test	x ± SD	40.09 ± 11.72	40.2 ± 11.87	U: 890.500	0.933
	Median (min–max)	38 (23–74)	37.5 (20–74)		
Post-test	x ± SD	37.53 ± 9.28	41.75 ± 9.74	t: 2.043	0.044
	Median (min–max)	37 (20–61)	40 (24–65)		
	Test statistic [b]	z: 401.000	−0.726		
	p	0.384	0.472		
Trait anxiety score					
Pre-test	x ± SD	45.16 ± 9.97	44.73 ± 12.57	U: 899.500	0.996
	Median (min–max)	44 (29–77)	43.5 (23–80)		
Post-test	x ± SD	41.33 ± 9.32	42.7 ± 7.21	t: 0.749	0.456
	Median (min–max)	42 (21–64)	43 (24–62)		
	Test statistic [b]	z: 370.500	0.912		
	p	0.216	0.367		

U: Mann–Whitney U b Paired-samples t-test, z: Wilcoxon test, t: Independent samples t-test, x ± SD: Arithmetic mean ± standard deviation
*$p < 0.05$

our findings, Bramson et al. applied the imagery technique on medical students while practicing lumbar puncture and found no significant difference between the groups in terms of practice skills (25). It can therefore be argued that repeatedly practicing skills in the laboratory environment before clinical practice affects the students' self-efficacy perception positively. Nursing is a profession that heavily requires lifelong learning. Therefore, nurses can use the imagery technique to improve basic nursing practices.

In the present research, the mean state anxiety scores of the students in the intervention group before and after the application were 40.09 ± 11.72 and 37.53 ± 9.28, respectively, and the mean trait anxiety scores of the students in the control group before and after the application were 40.2 ± 11.87 and 41.75 ± 9.74, respectively. The state anxiety scores decreased significantly in the intervention group after the application of the imagery technique when compared with the control group (p<0.05). While a high level of anxiety negatively affects academic achievement, low level of anxiety also affects success negatively. In a previous study examining the relationship between academic achievement and anxiety, it was found that normal anxiety levels increased academic achievement (30). In another study, it was reported that as the knowledge level of individuals increased, anxiety levels

decreased and they performed better (31). Studies examining the relationship between clinical practice and the anxiety level of nursing students reported that the anxiety levels were high before nurses performed a clinical practice for the first time and that it decreased gradually as they repeatedly performed the clinical practice (32-35). In this research, the level of anxiety decreased in intervention groups after skill practices in the laboratory. Consistent with the results of this research, three other studies also found that the anxiety levels of the students decreased after the mind-developing practices aimed at reducing anxiety (30, 31, 35). In a study examining the effect of the imagery technique on drawing blood, it was determined that the achievement level of the intervention group was significantly higher than that of the control group (27). Cognitive and psychomotor development of the mind in turn improve skill training practices.

The study includes university students in a particular region. Therefore, the results cannot be generalized to the whole population. These are the limitations of our study.

CONCLUSION
The results of this study show that the imagery technique resulted in a significant decrease in the state anxiety levels of the nursing students, while the trait

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anxiety and self-effectiveness–efficacy levels were not affected. There are only limited studies in the literature evaluating the effectiveness of imagery technique in basic skill practice training of the nursing students. Therefore, the results of this study are expected to contribute to the nursing profession. We recommend that the academic nurses develop various imagery technique applications for skill training based on the results of this study. The imagery technique should not replace the skill practice in the laboratory but rather serve as a supporting method for areas involving psychomotor learning, such as professional skill teaching in nursing. Since the results obtained in this research are limited to students in a single university, more comprehensive randomised controlled studies should be conducted to support and validate the findings.

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