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Original Article

The effect of surgical preference card on the clinical self-efficacy of operating room students

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ABSTRACT

Background & Aim: A wide range of clinical education of operating room students is done in the operating room. One of the problems in students' clinical education is the lack of appropriate learning tools in the operating room. The use of educational tools that improve students' performance affects students' self-efficacy in the operating room. So, the purpose of this study was to investigate the influence of the surgical preference card as an educational aid tool on the self-efficacy of the operating room students.
Methods & Materials: This quasi-experimental study was carried out on 64 operating room students of Isfahan University of Medical Sciences at AL-Zahra Hospital in the year 2018. Participates were selected through convenience sampling and were divided into experimental (n=32) and control (n=32) groups. The students in the intervention group performed surgical care with using the surgical preference card. The data collection tool was a clinical self-efficacy questionnaire. Data were analyzed with SPSS-21 software using the independent-t, paired t-test, and chi-square test.
Results: The findings of this study showed that there was no significant difference between the average self-efficacy score of the control group before and after the intervention ($p>0.05$). while the average self-efficacy score of the experimental group increased significantly after the intervention as compared with before the intervention ($p <0.001$).
Conclusion: The surgical preference card as an educational aid tool improved the students' self-efficacy. Therefore, it is recommended to use this tool for the clinical education of other operating room students.

Introduction

The operating room is a dynamic, high-risk setting requiring effective teamwork to provide optimal care for patients (1). The teaching and learning process in the operating room environment, then other clinical environments because of variations in surgical procedures and unpredictability of surgeries is difficult (2). So, students should coordinate their learning with their activities in different clinical situations (3).

Clinical education is an essential part of the operating room students' curriculum in which students integrate knowledge, skills, attitudes, and philosophies of the profession (2). Unfortunately, existing clinical education does not equip the operating room students with the required ability to acquire clinical skills. Some reasons for this inadequacy are the lack of coordination between the theoretical and techniques contents, the lack of cooperation surgeons and operating room staff with students, and the lack of use of educational aid tools in the operating room (4).

Clinical self-efficacy is an important part of clinical education and influences the ability of students to take proper care of patients (5). According to Bandura's self-efficacy theory, self-efficacy is defined as believing in one's own ability to do things effectively in different situations (6). Effective clinical training brings a sense of self-efficacy and self-esteem in students.

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Therefore, Students with high self-efficacy can have a better performance in difficult conditions (7). Studies show that the self-efficacy of operating room students is at a moderate level (8, 9). The use of learning strategies and tools that students take part actively in the learning process will increase the students' self-efficacy (10).

Surgical Preference Card (SPC) is considered an educational tool in the operating room; Operating room nurses know the technical requirements of surgical procedures, and these nursing and surgical routines are recorded as the Surgical Preference Card (11). These cards contain information, such as surgical position, medications, and solutions needed for a surgical field, equipment, supplies, instrumentation, suture, type of surgical dressing, and other instructions (figure1) (12). With access to these cards, staff and students can prepare the operating room and predict surgical needs as a result; it improves the operating room efficiency (13-14).

Although positive results have been reported regarding the use of SPC in the operating room environment, its impact on clinical education on student self-efficacy has not been investigated. Therefore, considering the importance of the training of operating room students in clinical practice and the need to pay more attention to their clinical education, On the other hand, lack of studies on the effect of clinical teaching methods on self-efficacy of operating room students, the present study was conducted to investigate the effect of the SPC on the self-efficacy of operating room students at Al-Zahra Hospital in Isfahan.

Splenectomy Laparoscopic

Position	Right lateral
Medications	Povidone iodine 7.5% & 10% Alcohol 70% Sodium Chloride 0.9% Injection 1L Lidocaine gel , Sterile distilled water
Equipment	Electrosurgical unite with dispersive electrode Monitor , Cylinder Co2 , Insufflator , Cold light source Charge-Coupled Device (CCD) Video cassette recorder (VCR) Suction machine medical Ligasure unit
Supplies	Basic pack 2-Way Silicone Foley catheter , Urine bag , 10 cc Syringe Rubber band 15cm (2), Velband 15cm (2) Surgical scalpel blade 11 5 mm trocar (2) , 12 mm trocar (1) , Visiport (1) Jackson-Pratt Drain Lens cover , Red Nelaton Chatter Hemolok Ligating clip Irrigation-aspiration set (suction tubing, urology irrigation set) Sterile gauze, Sterile surgical gloves
Instrumentation	General Set Laparoscopic instrument: Lens 30^0 , Veress Needle , Metz Scissor Fenestrated Grasping, Maryland Grasper, L-Hook Clip Applier, Suction - Irrigator, Bowel Grasping Forceps Endo Clinch, Endobag, Ligasure Handpiece
Suture and usage	Fascia: 1 Vicryl Round Skin: 3-0 Nylon Sharp Drain fixation: 0 Silk Sharp
Dressing	Simple Dressing
Other orders	Pillow/pad , Belt , kidney rest , Armboard

Figure 1. Simple of surgical preference card

Methods

This quasi-experimental study was carried out between two groups with a pretest-posttest design at Al-Zahra Hospital, in the year 2018. The study population in this research included 83 operating room students in total. Considering 95% confidence coefficient, 80% Statistical power, the minimum sample size was selected 64 individuals (32 in each group). Students were selected through convenience sampling and divided into experimental (n=32) and control (n=32) groups. Students in both groups were matched based on the academic year, grade point average, and gender.

The Inclusion criteria included, samples were selected from the second, third, and fourth-year operating room students, the student has passed internship theory courses and participants should be selected from undergraduate operating theatre students.

To measure the self-efficacy of students, a questionnaire was used that was developed by Sedigh et al., (2017) as a self-report instrument (15). This tool consists of two parts, the first section included demographic characteristics (age, gender, Grade Point Average, and academic year, Marital status, habitat); and the second section contained 17 items with a 5-point Likert scale (1=strongly disagree, to 5=strongly agree) to assess clinical self-efficacy of students. The score for the entire questionnaire ranged from 17 to 85, which to a better ranking, it turned into percent. Therefore, Low self-efficacy score from 0 to 33 percent, 34 to 67 percent of mediocre self-efficacy, and high self-efficacy was 68 to 100 percent.

Phrases in the questionnaire were about perioperative care, preparing surgical requisites (surgical set, equipment, instrumentation, sutures, surgical dressing, and other instructions) and the self-confidence and independence of students in the operating room. Based on the Sedigh et al report, the reliability of the instrument was calculated using the Cronbach alpha coefficient, which was equal to 0.84 (15). After a brief change in the questionnaire, its validity and reliability were re-evaluated in our study. Therefore, the validity of the questionnaire was confirmed by 10 faculty members of School of Nursing and Midwifery of Isfahan, Iran and to confirm the reliability of the questionnaire, 10 operating room students completed the questionnaire before the intervention, and its reliability was calculated using the Cronbach alpha coefficient, which was equal to 0.81. The intervention was conducted in two stages. Students of the control group attended apprenticeship in March 2018 and students of the experimental group attended apprenticeship in April 2018. The course of apprenticeship lasted 5 days (Diagram1):

First stage: At this stage, the students of the experimental and control groups without any intervention and based on their experiences of surgical procedure performed surgical care. Post-surgical, self-efficacy questionnaire was completed by the students (pre-test).

Second stage: At this stage, the students of the control group, as in the first stage, the surgical care without using SPC and based on their experiences performed. The students of the experimental group in this stage were familiarized with SPC. Then, students with access to these cards performed surgical care. Post-surgical, self-efficacy questionnaire was completed by students of the experimental and control groups (post-test).

Data were analyzed using IBM SPSS ver. 21.0 (IBM Corp., Armonk, NY, USA) software. The normality of data was tested using the Kolmogorov–Smirnov test. The independent t-test was used to determine the difference in the mean score of age, Grade Point Average (GPA), and self-efficacy of students in two groups. The chi-square test was used to determine the difference in the frequency distribution of gender, marital status, and academic year between the two groups. A paired t-test was used to determine the difference in the mean scores of self-efficacy in two groups before and

after the intervention. The level of significance was set at <0.05.

This study was approved by the Ethics Committee of Isfahan University of Medical Sciences, Iran (with the code of IR.MUI.REC.1396.3.842). We explained the objectives to the participants and received their written consent for participation in the study. The participants were further assured that their information would be kept confidential.

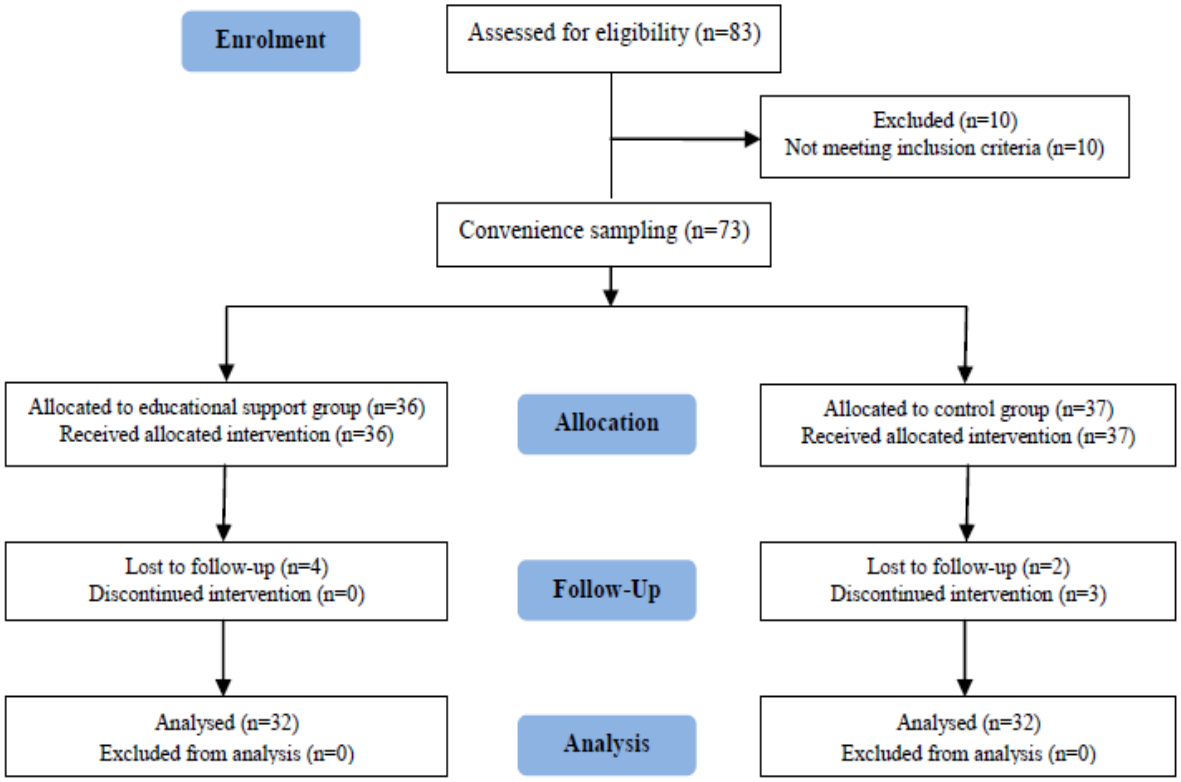

Figure 2. The research process

Results

The demographic characteristics of the 64 study participants are presented in Table 1. Based on the results of the independent t-test, the chi-square test the 2 groups were non-significantly different in terms of Age (P=0.46, t=0.74), GPA (P=0.94, t=0.07); gender (P= 0.52, X2=0.41), Marital status (P=0.40, X2=0.72), residence (P=0.40, X2=0.72) and academic year (P=0.08, X2=0.96) (Table 1).

Based on paired t-test, between the average self-efficacy scores of the control group before and after the intervention, there was no significant difference (p>0.05), while the average self-efficacy scores of the experimental group were significantly higher after the intervention as compared to before the intervention (p<0.001) (Table 2).

Based on independent t-test, the average self-efficacy scores of the control and experimental groups equaled 68.19 and 68.53 (out of 100), which before the intervention indicating that statistically there was no significant difference between the mean scores of the two groups (P=0.90), while after the intervention the average self-efficacy scores of the control and experimental groups recorded to be 67.93 and 77.33 respectively, which was statistically significant (P<0.001). Based on the independent t-test, the mean of changes in self-efficacy scores in the experimental group increased compared to the control group, which was statistically significant (p<0.001). (Table 3).

Table 1. Demographic and qualitative characteristics of students in two groups

Outcomes	Groups		P-value
	Experimental n(%)/mean±SD	Control n(%)/mean±SD	
Gender			
Female	25 (78.1)	27 (84.4)	**X2=0.41, P= 0.52**
Male	7 (21.9)	5 (15.6)	
Marital status			
Single	25 (78/1)	22 (68/8)	**X2=0.72, P= 0.40**
Married	7 (21/9)	10 (31/2)	
residence			
Dorm	10 (31/2)	7 (21/9)	**X2=0.72, P= 0.40**
Non-dorm	22 (68/8)	25 (78/1)	
Academic year			
First	13 (40/6)	14 (43/8)	
Second	7 (21/9)	7 (21/9)	**X2=0.96, P=0 .08**
Third	12 (37/5)	11 (34/3)	
Grade point average	17.07±1.40	17.09 ±1.08	**t=0.07, P=0.94**
Age	21.81±2.76	21.41±1.39	**t=0.74, P= 0.46**

Table 2. Comparison of the average self-efficacy scores of students (out of 100) between before and after intervention in each group

Characteristics		Before mean±SD	After mean±SD	Paired t-test	
				t	p
Self-Efficacy	**Control**	68.19 ±10.71	67.93±9.55	t= 0.25	**P= 0.80**
	Intervention	68.53±11.11	77.33±10.75	t= 6.80	**P<0.001**

Table 3. Comparison of average self-efficacy scores (out of 100) and difference scores before and after between the two groups before and after the intervention

Self-Efficacy	Control group mean±SD	Intervention group mean±SD	Independent t-tests	
			t	p
Before	68.19 ±10.71	68.53±11.11	t= 0.13	**P= 0.90**
After	67.93±9.55	77.33±10.75	t= 3.70	**P<0.001**
Before-After Difference	-0.26±1.03	8.80±1.2	t=5.47	**P<0.001**

Discussion

The findings of this study indicated that the use of SPC improved student self-efficacy; that way the mean self-efficacy score in the experimental group significantly increased after the use of cards compared to the control group.

A review of the literature, no studies were found on the impact of the SPC on students' self-efficacy, but educational methods similar to SPC have been studied on students' self-efficacy.

In a similar study performed by Habibzadeh et al, to examine the effect of evidence-based education on the self-efficacy of nursing students, the mean score of students' self-efficacy in the experimental group increased compared to the control group (16). In another study by Abdal et al, to examine the Clinical self-efficacy in senior nursing students, the use of logbooks in clinical settings was introduced as a tool for improving the self-efficacy of students (7). The findings of Habibzadeh and Abdel's studies were in line with our results and indicated the use of educational guides in clinical settings can improve students' self-efficacy. Nowadays, due to the abundant emphasis on resource management, cost control, the effectiveness of patient care, quality improvement, and responsibility, the use of Strategies that can improve patient care seems to be essential. These frameworks and Strategies can be formulated as educational guidelines (16).

The studies that contradict the results with our results are the study of Tuttle and cox. In a study by Tuttle et al., to investigate the impact of simulated training programs on clinical self-efficacy of nursing students, the results showed that using simulated

training programs increased the students' self-efficacy in the experimental group compared to the control group but this increase was not statistically significant (10).

In another study by cox, et al; which aims was to compare three training methods (established curriculum (readings only), Faculty-led curriculum, and Web-based curriculum) on self-efficacy of medical students. The results of this study showed that using a web-based curriculum and Faculty-led curriculum compared to the established curriculum (readings only) significantly increased students' self-efficacy inpatient care (17). The results of this study were in contrast to the results of our study. The reason for this discrepancy may be due to differences in the samples studied or the use of training programs with an appropriate approach to clinical guidelines. Overall, clinical instructors by designing the surgical preference card can provide an opportunity for improving students' self-efficacy. Students with access to specific Card to each surgery learn the essentials of that surgery and directly carry out surgical cares, As a result, improve their self-efficacy.

Limitations of the study

The main limitation of this study was the non-random allocation of samples in two experimental and control groups. Due to the problems that exist in the educational planning of college, it was impossible to actually allocate samples randomly. In response to this limitation, the samples were matched in both groups in the academic year, gender and type of surgical procedure.

Conclusion

The use of the surgical preference card for the training of operating room students improves their self-efficacy. The findings of this study showed that there wasn't a significant difference between the average student self-efficacy scores of the two groups before using the SPC while the average student self-efficacy scores in the experimental group significantly increased after using the SPC as compared with the control group. Therefore, it is recommended that operating room students use SPC as an educational aid tool in preparing the perioperative requirements and cares.

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Conflicts of interest

There are no conflicts of interest.

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