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INVESTIGATING THE EFFECT OF DISPLAYING FILM BEFORE CRANIOTOMY SURGERY ON SELF-EFFICACY AND STRESS IN OPERATING ROOM TECHNOLOGY STUDENTS IN ISFAHAN'S SELECTED EDUCATIONAL HOSPITALS, IN 2017

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ABSTRACT

Background and Objective: the researchers are seeking to find ways to more effectively offer the educational programs to the university students. There are numerous advantages in delivering the instructional material by way of educational films. The present study aims at investigating the effect of displaying films before craniotomy surgery on self-efficacy and stress in operating room technology students in Isfahan's selected educational hospitals.
Materials and Methods: Fifty operating room bachelor student from semesters 4, 6 and 8 were stochastically assigned to two test and control groups in the current randomized two-staged (before and after) clinical trial research with evidence group. Craniotomy surgery films were displayed for the test group before the onset of operation and the control group was given the routine instructions. Data collection instrument was comprised of two researcher-constructed questionnaires which were based upon the standard perceived stress scale (PSS) and self-efficacy questionnaire by Sherer. Both of the questionnaires underwent reliability and validity tests and they were put into use after they were confirmed. The data were analyzed by means of SPSS 16 through taking advantage of descriptive and analytical tests in a 0.05 significance level.
Findings: the results indicated that the pre-intervention perceived stress mean scores of the two test and control groups are not reflective of a significant difference (P>0.05). Also, the pre-intervention self-efficacy mean scores of the two test and control group was not suggestive of a significant difference (P>0.05). Post-intervention perceived stress mean score in test group was found significantly lower than the control group. Furthermore, post-intervention self-efficacy mean score was found significantly higher in test group than the control group (P<0.05).

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Introduction

Nowadays, the university students require knowledge of various subjects from different fields to successfully deliver nursing cares. Having a clear understanding of the nature of the surgery and the techniques commonly used in various surgical operations is among these subjects. It is through this attainment of an accepted level of awareness and assessment of the university students' performance that their educational needs can be determined to a great extent [1]. Due to the importance of their duties, the operating room students need to learn and be taught with the fundamental materials so as to be able to play a part in critical operations like craniotomy. Craniotomy surgery is a very complicated and critical operation [2]. It is

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necessary to provide the university students with appropriate curriculum programs to enable them carry out proper interventions during surgical operations. Today, dynamic curriculum programs are envisaged more optimum and they are under constant revisions and reviews as a consequence of environmental feedback received. Programmed teaching is one of the accepted principles in the modern education [3]. Also, establishing an appropriate communication between the professors and students is of a great significance for the improvement of education process [4]. On the other hand, making better uses of novel methods within various educational levels, particularly higher education is one of the most important challenges in the face of education officials.

It is continuously endeavored in this method to make more optimized use of the existing facilities and get the learners more actively participated in educational affairs [5]. Educational films such as images, charts, posters, listening audios and books are among the educational media that provide the university students with considerable facilities. Educational films featuring such significant elements as image, sound and motion can facilitate the clinical education process and set up more optimum learning environments to the university students [6]. Educational films are extensively applicable in medical sciences fields of study, especially in areas that there is a need for acquiring clinical skills and practical precisions [7]. Studies are indicative of a substantial enhancement in students' skills after the use of educational films in contribution to their learning of the clinical processes. These studies are indicative of the idea that the proper utilization of images and films in teaching skills can lead to a better learning accompanied by greater satisfaction of the learners. The more the education is fruitful the more the university students are capable of delivering more optimized performance [8]. On the other hand, some researches underline the neutrality of such methods [9&10]. Also, some graduates from operating room majors do not seem to have an optimum evaluation of their clinical skills [11]. One factor that influences the students' viewpoints towards education is their self-efficacy levels [12]. Self-efficacy is conceptualized as the individuals' beliefs in their abilities for exerting some control over their own performances as well as on the environmental events [13]. In educational environments, self-efficacy points to the university students' opinions in respect to their abilities for accomplishing the assigned educational tasks. The students with higher self-efficacy attribute their failures to lower efforts they have made rather than to their lower levels of abilities and competencies; on the contrary, the students with lower self-efficacy know their failures a result of their lower levels of abilities [14].

Also, education is a highly stressful experience, particularly in medical sciences professions where it is the humans' lives that are on the line [15]. That is because the students are in the process of combining their theoretical knowledge with their mental, psychological and motor skills that are required for taking care of the patients in such a stage of education the outcome of which would be an acquisition of professional competencies [16]. Various tensing factors lead to stress and anxiety in the nursing students within clinical environments. The most important tensing clinical factors in the students are the first clinical experience, fear of implementing wrong methods, being evaluated by the professors and the insufficient availability of the clinical instructors. The accumulation of stressing factors results in burnout and would have negative effects on learning [17].

According to the different results obtained in various studies regarding the effectiveness of displaying films and the importance that is given to the way the operating room technology students are trained clinically, especially for craniotomy surgeries due to the need for careful observation of sterility points and high risk of infection for the patient and, also, the necessity for paying a far greater attention to their clinical education and, on the other hand, the extent of the students' stress and self-efficacy as two problems that come about in confrontation with specialized surgical operations that are directly connected to the professors' teaching methods, the current research paper aims at the investigating the effect of displaying films before craniotomy surgeries on the stress and self-efficacy in operating room technology students.

Materials and Methods

The present study has been carried out in the form of a randomized two-staged (before and after) clinical trial with evidence group. The study population included all the bachelor student from semesters 4, 6 and 8. First of all, the entire students were selected and then 50 students were assigned to two control and test groups considering the inclusion criteria. Data collection instrument was consisted of two researcher-made questionnaires: standard perceived stress scale (PSS) and Sherer's self-efficacy questionnaire. Standard self-efficacy questionnaire contained 17 questions for which a Cronbach's alpha coefficient of 0.79 had been obtained in the previous researches. For every question in self-efficacy questionnaire five responses are suggested. The scores for questions 3, 6, 8, 9, 13 and 15 are increased from right to left and the rest of the questions' scores increase inversely, to wit from left to right. The individuals who acquire higher or lower standard deviation values are to be determined as individuals having higher or lower self-efficacy, respectively.

Standard perceived stress scale contained 14 questions for which a Cronbach's alpha coefficient equal to 0.86 had been found in the prior studies. The questions were scored based on Likert's five-point scale as follows: "0=never", "1=almost never", "2=sometimes", "3=often" and "4=almost always". Phrases 4, 5, 6, 7, 9, 10 and 13 are scored inversely ranging from "4=never" to "0=almost always". The minimum possible score is 0 and the maximum possible score is 56. Higher scores are reflective of higher levels of perceived stress. The questionnaire was adjusted by taking advantage of Sherer's standard self-efficacy questionnaire and standard perceived stress scale (PSS). The questionnaire's content validity was confirmed by ten faculty members (three members from nursing psychology, two members from management department and five members

from operating room department) from Isfahan's obstetrics and nursing faculty. Both the scales were also subjected to reliability verification tests. Cronbach's alpha coefficients equal to 0.86 and 0.84 were obtained for self-efficacy questionnaire and perceived stress scale after running pilot studies.

Data collection was done for control group before and after scrubbing and at operation termination. As for the test group, data were collected before displaying the film and after the termination of surgery.

Study environment was the orthopedic and nerves operation room in Kashani Hospital and the Al-Zahra (peace be upon her) hospital's operation room. The study subjects were to provide informed consent letters. Surgery film was displayed for the test group students on the surgery day in the morning through getting it coordinated with the individual in charge of the operating room. This 25-minute educational film exhibited the entire surgery stages and techniques as well as the necessary tools.

Data were analyzed by taking advantage of SPSS ver.16 and through running covariance analyses tests (ANCOVA), paired sample t-tests and independent t-tests, chi-square tests and Mann-Whitney U-test in a 0.05 significance level.

Results

In a randomized two-staged (before and after) clinical trial with evidence group, 50 operating room BA students from semesters 4, 6 and 8 were randomly assigned to two 25-individual, test and control, groups. The subjects were investigated for the effect of displaying films before craniotomy surgery on the self-efficacy and stress levels of operating room technology students in Isfahan's selected educational hospitals.

The demographic characteristics and qualitative specifications of the two groups are presented in (Tables 1 , 2). The results indicated that there is no significant difference (P-value>0.05) between the two studied groups in terms of gender and educational semesters frequency distributions. Also, the students' average ages was significantly lower in intervention group as compared to the control group (P-value<0.05). This is while the students' average marks were not found having significant difference in both of the groups (P-value>0.05).

Table 1: frequency distribution of the study groups' qualitative demographic characteristics

		Sex		Total	P-value
		Female	Male		
Group	Intervention	12 48.0%	13 52.0%	25 100.0%	0.571
	Control	14 56.0%	11 56.0%	25 100.0%	
Total		26 52.0%	24 48.0%	50 100.0%	

		Term			Total	P-value
		Term 4	Term 6	Term 6		
Group	Intervention	8 32.0%	9 36.0%	8 32.0%	25 100.0%	1.00
	Control	8 32.0%	9 36.0%	8 32.0%	25 100.0%	
Total		16 32.0%	18 36.0%	16 32.0%	50 100.0%	

Table 2: frequency distribution of the study groups' qualitative demographic characteristics

	Group	Mean	Std. Deviation	Std. Error Mean	P-value
Age (year)	Intervention	21.04	1.27	0.25	0.035*
	Control	22.16	2.25	0.45	
Grade	Intervention	16.91	1.25	0.25	0.905
	Control	16.95	1.14	0.23	

There was no significant difference between the two groups in terms of the pre-intervention perceived stress mean scores (P-value=0.057>0.05). Also, no significant difference was figured out between the two groups in terms of pre-intervention self-efficacy mean scores (P-value=0.051>0.05). According to a mean score obtained for the perceived stress scale, based on the questions' coding, equal to 28, it was observed that on average both the groups had high perceived stress rates. According to a mean score obtained for the self-efficacy scale, based on the questions' coding, equal to 34, it was observed that on average both the groups had low self-efficacy rates (Table 3). The results are given based on groups' independent t-tests.

Table 3: determination and comparison of perceived stress and self-efficacy pre-intervention mean scores between the two study groups

	Group	Mean	Std. Deviation	Std. Error Mean	P-value
Stress before intervention	Intervention	44.36	5.84	1.17	0.057
	Control	41.28	5.92	1.18	
Self-efficacy before intervention	Intervention	18.00	2.80	0.56	0.051
	Control	19.80	4.93	0.99	

As it is shown below, the post-intervention perceived stress mean score is significantly lower in the intervention group in contrast to the control group (*P-value=0.001<0.05). Also, it was found out that post-intervention self-efficacy was significantly higher in intervention group in respect to the control group (*P-value=0.001<0.05).
It is noteworthy that the intervention was followed on average with a lower perceived stress (the perceived stress mean score was 12.94 which is lower than the mean score obtained by means of questionnaire, 28); moreover, the self-efficacy was shown on average to have undergone an increase in the intervention group. Also, the perceived stress mean score for post-intervention control group indicated a significant increase (*P-value=0.012<0.05) and the self-efficacy mean score, on the contrary, showed a decline (*P-value=0.048<0.05) (Table 4).

Table 4: determination and comparison of the perceived stress and self-efficacy mean scores of the two study groups after intervention

Group (stress)	Mean	Std. Error	95% confidence interval		P-value
Intervention	13.43	1.73	9.95	16.91	0.001*
Control	44.81	1.73	41.33	48.29	
Group (self-efficacy)	Mean	Std. Error	95% confidence interval		P-value
Intervention	55.81	2.48	50.82	60.81	0.001*
Control	20.67	2.48	15.67	25.67	
*Covariance appearing in the model are evaluated at the following values: Age(year)=21.60, self-efficacy=18.90 and Stress before=42.82					

Based on (Tables 5 , 6), the test groups' post-intervention perceived stress mean score has undergone a significant decrease in respect to what was found pre-intervention (*P-value=0.003<0.05) and there is observable a significant increase in self-efficacy mean score as compared to what was calculated for pre-intervention (*P-value=0.001<0.05).

Table 5: determination and comparison of the stress and self-efficacy mean scores for pre- and post-intervention control group

Control group	Mean	Std. Deviation	Std. Error Mean	P-value
Stress before intervention	41.28	25.00	5.92	0.367
Stress after intervention	44.76	25.00	11.23	
Self-efficacy before intervention	19.80	25.00	4.93	0.306
Self-efficacy after intervention	21.00	25.00	14.28	

Table 6: determination and comparison of the stress and self-efficacy mean scores pre- and post-intervention in test group

Intervention group	Mean	Std. Deviation	Std. Error Mean	P-value
Stress before intervention	44.36	5.84	1.17	0.003*
Stress after intervention	13.48	2.86	0.57	
Self-efficacy before intervention	18.00	2.80	0.56	0.001*
Self-efficacy after intervention	55.48	8.86	1.77	

Discussions

Having access to an appropriate teaching method besides decreasing the educational costs causes an enhancement in the students' self-efficacy and mitigation of stress in performing the clinical activities. The current research paper with the objective of investigating the effect of displaying films before craniotomy surgery on the operating room technology students' stress and self-efficacy demonstrated that showing educational films to the students exerts positive effects on stress reduction and self-efficacy enhancement. In the present study, the post-intervention perceived stress rate was found lower in the test group as compared to the control group; furthermore, it was found that there is a significant difference between the test and control groups in terms of post-intervention self-efficacy mean scores. The findings of the current research paper indicated that the test group students' self-efficacy was increased after watching educational films. These students were capable of properly preparing the surgery instruments and they could hand over the surgery tools to the surgeons by twice as much readiness. Also, showing craniotomy surgery films could improve the self-efficacy of the students who were also concomitantly found to have lower stress.

The results of the study by Brearley on the use of film displaying and live show for two groups of dentistry students showed that the students were able to follow the work a lot more vividly and in a more detailed manner when they were shown films. The university students believed that if the film displays could be accompanied by direct observation in a surgery unit and if the facilities for video conferencing could be utilized so as to provide for direct communication and interaction between the surgeon and the students the results would be a lot better [18]. Therefore, the results obtained in the present study conform to what was found in the foresaid research.

In addition, a research undertaken by Ma et al in China in 2014 studied 100 medical students. The results showed that the use of educational films in teaching the clinical examinations to the medical students is effective on enhancing their self-efficacy as well as their practical skills in comparison to the traditional teaching methods [19]. The findings of the present study are also consistent with the foresaid research.

In a study performed by Odell et al (2001), many of the professors were found quite satisfied with the idea that they could spend much lesser time on teaching a subject and they asserted that materials are presented more vividly and more perfectly in video conferencing films, though the quality of film was also indicated as being an effective factor in learning [20]. Also, the results obtained in the study carried out by Beigi et al (2012) signified that teaching assertiveness skills in groups makes significant differences in boy and girl students' mean self-efficacy opinions and, therefore, it can be stated that teaching assertiveness in groups can bring about an increase in university students' self-efficacy beliefs [21].

Despite the results obtained herein, the results attained by Nikboresh (2002) in a study aimed at surveying the effect of displaying cartons on children's stress during dental surgeries through examining the saliva cortisol level indicated that showing cartons does not have any effect on the children's reduction of stress [9]. In a study conducted by Jeffries aiming at comparing the effectiveness of the two methods, namely traditional teaching (short lectures and presentation of the instructional materials by the teacher) and electronic teaching (interactive multimedia), on ECG performing skill, the results indicated that both of the groups were satisfied with their teaching methods and there was not found any significant difference in terms of the intended skill. Meanwhile enhancing the students' knowledge of the subject, both of the methods were found having identical performance and this is not complying with the results obtained herein [22]. Also, the results obtained in a study undertaken by Mo'emeni et al with the objective of "comparatively investigating the effect of teaching by taking advantage of film displays and instructional manuals in two different times on the pre-surgery anxiety of the patients nominated for coronary artery bypass graft" showed that teaching by means of films, on the day before surgery, has not been effective on the apparent anxiety of the patients which is against what has been found in the current research paper. It seems that this disagreement of the results has been due to the differences in the samples types and the study population as well as the discrepancies in the study sample volumes in the abovementioned studies.

Conclusion

According to the obtained results, the operating room students have high rates of stress when participating in substantial surgical operations like craniotomy and this adversely influences the students' self-efficacy and role-playing. Displaying films before scrubbing for surgical operation not only enhances the students' learning and their practical utilization of their skills during surgical operation but it also helps the students experience professionalization process in practice and attend the surgery with a lower level of stress. Due to the same reason, the professors should pay a greater deal of attention to educational film displaying before the onset of surgical and scrubbing operations.

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