

Investigating the effect of video-based training on stress score

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ABSTRACT

Introduction: Researchers are looking for ways to offer more effective education programs for students. There are many benefits to offer educational content via video. This study aimed to examine the effect of film-based education on the stress of operating room technology students in selected teaching hospitals in Isfahan. **Methods:** In this randomized controlled clinical trial and two-stage (before and after) study, 50 undergraduate operating room students in the 4th, 6th and 8th semesters were randomly assigned to the experimental and control groups. For the experimental group, a surgery training video was shown before the operation and the control group received routine training. The data collection tool was a researcher-made questionnaire that after confirming the reliability and validity of the content was used based on the standard Perceived Stress Scale (PSS). Data were analyzed using SPSS 16 software through descriptive and analytical tests with a significance level of 0.05. **Findings:** The results revealed that the perceived stress mean score before the intervention was not significantly different between the experimental and control groups ($p > 0.05$). The mean score of perceived stress after the intervention in the experimental group was significantly lower than the control group. **Conclusion:** Showing educational video as an educational supplement can decrease the stress of operating room technology students in performing surgeries. Consequently, using this method for teaching students is suggested as a complementary teaching method.

Keywords: Video, Stress, Operating room, Students.

Introduction

The operating room is a complex system that coordinates the person, technology, and patients in a physical environment to achieve the desired outcomes in patients [1]. Some of the problems that may happen to the patient after the operation are due to the lack of experience of the operating room staff. These cases may result in the death of the patient. Due to this fact, it is necessary to strengthen the necessary knowledge and skills of nurses in operating room environments [2].

Because operating room students have to scrub and be ready for surgery, they need basic training to play a role in the operating

room by learning all the necessary points. Learning and adapting to different types of skills and different work roles in the operating room environment is difficult because students have to undergo many interventions in the process before, during, and after surgery. The wide field of activity in the operating room highlights the need for adequate skills and knowledge because students should be able to coordinate their information with their activities in different situations of the operating room [1].

As we live in an advancing technology era, we need to be aware of the audio-visual tools available, their quality, their ability, and their effect on learning. Over the past two decades, health centers have started to use educational videos for different people [3].

It has been several years that films have been widely used in group education, but with the advent of the videotape, which is easier to display in the classroom than film, the use of video tutorials has increased. Consequently, at present, dissimilar types of video training programs are made for use in different parts of education. To have an optimal teaching method, in its

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true sense, displaying short videotapes can be appropriately combined with the method of teaching lectures to provide learners with visual stimuli, different types of approaches, rich learning materials, and so on.

Also, educational videos are good tools for improving group discussions; because they can record real-life situations. This technique can be used as an educational tool; since its use as a tool for the critique of life events, it can provide direct feedback on complex actions related to interpersonal and psychomotor skills ^[3].

Video-based training is one of the methods that has received a lot of attention lately. The prominence of this method is particularly obvious in the fields in which the student must obtain practical skills in addition to theoretical teachings. For in this method, the film can be repeated many times so that the audience can see the desired practical skill repeatedly if necessary. Now, if the relevant instructor is present while watching the video, it is possible to exchange views and questions and answers between the instructor and the trainee in each part of the video, and this will help to make the educational process more productive. At different levels of higher education, including medical education, the use of this method can solve many problems and educational gaps ^[4]. Simulation enables students to avoid mistakes before practicing clinical skills and consequently increases their self-confidence ^[5]. The use of simulation in learning how to use staplers, laparoscopic devices, drep and prep, and other surgeries has played an important role in increasing students' self-confidence and self-efficacy and improving their clinical skills ^[6]. The use of simulators and multimedia in performing clinical skills increases students' self-confidence and self-efficacy and reduces their stress, and improves their psychomotor skills and it makes them do their job with more confidence at every step ^[7]. Nonetheless, the results of a 2009 Tiffen's study in Chicago on 18 nursing students to investigate the effect of mannequin simulation on nursing students' self-esteem in assessing the cardiac system did not report a significant difference between the two groups of simulation and lecture ^[8]. A study by Carvalho et al. (2004) to investigate the anxiety of 30 nursing students showed that 80% of nursing students in the clinical environment and interaction with the instructor suffer from overt moderate anxiety ^[9].

Research reveals that most university lecturers are still unfamiliar with active teaching methods and teach in the same ways that they were trained. For this reason, many of them still rely on traditional teaching methods ^[10]. About 72% of nursing educators use inactive methods (such as lecturing) to teach. Among the consequences of this method are inactivity and fatigue of students, rapid forgetfulness of content, lack of sufficient opportunity for questions and answers, and lack of motivation of students ^[11]. Medical students, on the other hand, prefer teaching methods that involve more participation. More useful, effective, and lasting learning is achieved by activating and involving more students in learning; therefore, education experts emphasize the use of new all-inclusive methods ^[12].

Today, the necessity of using new and active learning and student-centered methods has been felt by educational systems and the application of these methods has become common in various sciences, including medical sciences ^[13].

A pilot study was conducted in 2011 and 2014 on 95 medical students. In this study, the educational program of students in the pediatric ward was performed in the form of 8 short videos, and students were evaluated by 5 independent observers before and after this video program. At the end of the study, it was observed that the ability of students to present materials related to children's diseases had a significant increase. Also, receiving them from real samples of the disease showed real progress ^[14]. The results of Ma research, which was reported by 100 medical students in China in 2014, the use of educational videos in teaching clinical examinations to medical students in comparison with traditional teaching methods has been able to improve self-efficacy and improve practical skills in This field is effective ^[15]. Based on the above studies, which indicate the importance of educating operating room technology students in the clinical field, and especially large surgeries due to the importance of sterility points and high risk of infection and the need to pay more attention to their clinical education, on the other hand, the level of student stress as a problem in dealing with specialized surgeries that are directly related to the type of education provided by the professor, on the other hand, the discrepancy between the results of studies conducted in the use of active learning methods such as video training on students' stress and the lack of a study in operating room students, the researcher decided to conduct a study examining the effect of preoperative video on the stress of operating room technology students.

Method

This study is a randomized controlled clinical trial of two groups at two stages (before and after) that the first stage before scrubbing and the second stage after watching the film and scrubbing and finishing the operation in the intervention group and before and after the operation in the control group. The data were collected in two groups of intervention and control before and after the intervention. The intervention group includes the group for which the surgical film was shown.

The research environment in this study was the elective operating room 1 of Al-Zahra Hospital and the orthopedic and neurological operating room of Kashani Hospital affiliated to Isfahan University of Medical Sciences. The study population was all undergraduate operating room technology students in the 4th semester and beyond. The research sample includes 50 undergraduate students in operating room technology who met the inclusion criteria including lack of previous experience in neurosurgery and scrub at least 5 times in different surgeries.

In this study, a researcher-made questionnaire on perceived stress was used, which was adapted using the standard Perceived Stress Scale (PSS), and for validity, it was given to ten faculty members, 3 in the psychiatric nursing group, 2 in the

management group and 5 members of the operating room group) at Isfahan School of Nursing and Midwifery. The reliability of the self-efficacy and perceived stress questionnaire was obtained after the pilot as 0.86.

The research data are generally quantitative (continuous, discrete) and qualitative (nominal), and for their analysis from SPSS software version 20 was used with descriptive statistics and analysis of covariance (ANCOVA) and paired t-test and independent t-tests and Chi-square and Mann-Whitney test.

Results and Findings

To determine and compare the mean stress score of operating room technology students between before and after the intervention in the control group, Table 1 was set. The results are presented based on a t-test of two dependent groups.

To determine and compare the mean stress score of operating room technology students between before and after the intervention in the experimental group, Table 2 was set. The results are based on the t-test of the two dependent groups.

Table 1: Determining and comparing the mean stress score before and after the intervention in the control group

Control Group	Mean	SD	Average standard error	Z	P-value
Pre-intervention stress	41.28	25.00	5.92	-0.901	.367
Post-intervention stress	44.76	25.00	11.23		

The mean score of perceived stress in the control group after the intervention was not significantly different from before (P-value > 0.05).

Table 2: Determining and comparing the mean stress score before and after the intervention in the intervention group

Intervention Group	Mean	SD	Average standard error	Z	P-value
Pre-intervention stress	44.36	5.84	1.17	24.98	.003*
Post-intervention stress	13.48	2.86	.57		

The mean score of perceived stress in the intervention group after the intervention was significantly lower than before (* P-value < 0.05).

Discussion and Conclusion

Clinical education is a learning support activity in a clinical environment in which the participation of the instructor and the student is the same and the goal is for the student to achieve the desired educational goals for clinical care ^[16] and to create a suitable platform for aligning theoretical knowledge of students with practical skills, diagnosis and treatment of patients and

other professional skills, considering that the purpose of providing internship units is to achieve students' practical skills ^[17], if the student works under the supervision of a teacher with fluent clinical skills and familiar with the realities of the clinical environment, s/he will gain better skills and more realism ^[18].

Regarding the study, "the mean stress score of operating room technology students before and after the intervention in the control group in selected teaching hospitals in Isfahan has no difference. The results based on a t-test of two dependent groups showed that the mean score of perceived stress in the control group after the intervention was not significantly different from before (P-value = 0.367 > 0.05) so that the mean score of perceived stress before the intervention in the control group was 42.28 and after the intervention was 44.76.

Regarding the study "The mean stress score of operating room technology students before and after the intervention in the experimental group in selected teaching hospitals in Isfahan is different", the results using t-test of two dependent groups showed that the average perceived stress score in the intervention group, after the intervention was significantly lower than before (* P-value = 0.003 < 0.05) so that the average perceived stress score in the intervention group before the intervention was 44.36 and after the intervention was 13/48 and the mean self-efficacy score was significantly higher (* P-value = 0.001 < 0.05).

In Brearley's study, using film playing and live show in two groups of dental students, it was shown that in film showing case, students were able to follow the work much more clearly and in more detail. The result was that students believed that playing video was better, if it is used in conjunction with direct observation next to the unit or if it is possible to hold a video conference of the presenter to interact with students ^[19], all these studies evaluate the film positively, which is in line with the results of the present study.

In a study conducted by Norouzi et al. to compare the effect of video and drama instruction on instructional learning skills of one semester nursing students on 48 of them in Mashhad School of Nursing and Midwifery, the first semester students were randomly placed in the videos showing group under the supervision of the university teacher, and the second semester students were placed in the theater group through the film. Students' learning was made through a questionnaire and a researcher checklist and was evaluated during the OSCE test. Independent t-test and Mann-Whitney test were used to compare the learning rate in the two groups. The results showed that the mean scores of inserting and removing the gastric catheter, wearing and removing gloves by the non-surgical method were higher in the film group with the instructor than in the film group, but in terms of non-surgical hand washing skills, the results of the scores did not differ significantly between the two groups ^[11]. These studies are not in line with the results of the present study. Perhaps the reason for this difference is the difference in the skills studied in the two studies because the results of the present study are about large practice,

which is more complex than the skills studied in the mentioned studies.

The results of a 2009 Tiffen study in Chicago of 18 nursing students to investigate the effect of mannequin simulation on nursing students' self-esteem in assessing the cardiovascular system did not report a significant difference between the two groups of simulation via speech^[18]. It is consistent with the present study because, in both studies, students only had the experience of passing units in the faculty practice and working with existing simulators only before the relevant procedure. In Hemmati Maslakpak *et al.*'s study, the effect of peer coaching on the stressors of the clinical environment of nursing students was studied. In this quasi-experimental study, 44 second semester nursing students of Urmia School of Nursing and Midwifery were selected by census and randomly divided into two groups. Control ($n = 21$) and intervention ($n = 23$) were divided. In the intervention group, for every 4-5 people, a 7th semester nursing student, as a peer judge, took on the role of guiding and supporting students. The data collection tool was the Persian version of the clinical environment stressors developed by Kack and Kleehammer. The results showed that the mean scores of clinical stressors of students in the intervention group decreased from 50.45 to 41.9 after the implementation of the peer group program. In the control group, the mean scores of clinical stressors before and after the intervention of students did not show a statistically significant difference^[20]. It is in line with the results of the present study because both studies used new and active educational methods.

The results of the study of Momeni *et al.* with the aim of "comparing the effect of education with two methods of video and educational booklet at two different times on preoperative anxiety in patients undergoing coronary artery bypass grafting" revealed that video education, the day before surgery, it has not been effective on patients' overt anxiety. Also, in a study that Asteli *et al.* (2008) examined the effect of three audio-visual, written, and oral methods on the anxiety levels of angiography patients, the results show that there is no statistically significant difference between the three methods. The results of these studies were not consistent with the results of the present study and this difference may be due to the samples because in these studies the samples were patients^[18].

However, a study by Fredericksen *et al.* (2007) showed that 94% of learners who took the course electronically believed that their learning was as much or more than learning in a traditional classroom^[21].

Findings of the study of Aghvami and colleagues (2010) who compared the two methods of group and computer education on the quality of life of children aged 8-12 years with Asthma indicate a greater impact of computer education in increasing learners' awareness^[18].

Yeganehkah *et al.* (2012) who studied and compared traditional pamphlets and electronic education on reducing the average anxiety of patients with acute myocardial infarction reported no statistically significant difference between these three methods

^[22]. The result of this study is not in line with the current study and this may be due to the type of research samples in which the samples were patients.

In the study of Zraick and Schwartz, the patient and the traditional method were used to teach two groups of students. The results of these two studies show that the use of simulated patients has no advantage over traditional education and suggested that more research is needed^[23].

Findings from the present study showed a reduction in stress among students. According to the results, operating room students have a lot of stress in major surgeries such as neurosurgery. The video before scrubbing not only leads to learning and using skills during the operation, the students also experienced the process of how to become a professional and came to the operation with less stress. For this reason, it is recommended that the use of video methods before surgery and scrubbing be considered by professors.

Suggestions:

- Student education is unquestionably the most significant and basic part of the operating room education program, and any shortcomings and inadequacy in the education of this group certainly affect the quality of health services in the community. According to the results of the present study, it is suggested that new educational methods be used in educating students.
- Using the results, new research can be done in this area and the effect of video on other surgeries can be examined.
- Achieving an appropriate educational method, as well as reducing educational costs, reduces students' stress in performing clinical activities.

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