Original Article

# Comparison the effect of multimedia and peer training methods on the anxiety of Trans Esophagus Echocardiography candidate

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## Abstract

**Context:** Transesophageal echocardiography (TEE) is an invasive method that causes anxiety. Studies have shown that education is effective in reducing anxiety.

**Aims:** This study aimed to compare the effect of two educational methods of multimedia and peer training on the anxiety of patients who are candidates for TEE.

**Setting and Design:** This study was a randomized controlled clinical trial conducted in 2018 Mazandaran Heart Center, Sari.

**Materials and Methods:** 46 Patient seeking TEE (16 in the multimedia group(ME), 16 in the peer group(PE) and 14 in the control group) and randomly divided into three groups. The data collection tool was personal information form and the Spielberger State Anxiety Inventory. All groups received routine training. In addition,one intervention group, received PE and another intervention group received ME.

**Statistical Analysis Used:** Data were analyzed using SPSS 25. The significance level was considered below 0.05.

**Results:** There was no significant difference between groups in terms of personal and medical characteristics. The mean of anxiety scores before training was 44.6± 2.2, 46.18± 2.7, 46.5± 2 in the peer group, multimedia and control group ($P = 0.826$). The mean of anxiety scores in the peer group, multimedia and control group after intervention was 42.2 ± 3.3, 41.6 ± 2.6, and 47 ± 7 ($P = 0.354$). This difference was not statistically significant.

**Conclusions:** Both PE and ME groups decreased anxiety in patients with TEE. But it was not statistically and the use of these techniques required more studies.

**Keywords:** Anxiety, Multimedia training, Peer training, Transesophageal echocardiography

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## INTRODUCTION

Cardiovascular diseases are a leading cause of death in the world.[1] Transesophageal echocardiography (TEE) is the most frequently used diagnostic tool for cardiovascular disease;[2] TEE is a semi-invasive method compared to conventional transthoracic echocardiography and causes complications in the patient, especially when patients have poor collaboration.[3] A lack of tolerance to probe placement is often the reason for stopping TEE. The tolerance of TEE is largely dependent on patient's anxiety and his/her understanding of this diagnostic method;[4] therefore, one of the main goals in nursing care is reducing discomfort and increasing patient collaboration.

The methods used to reduce anxiety are divided into pharmacological and nonpharmacological categories.[5,6] Today, the tendency toward using nonpharmacological methods to reduce anxiety and relieve pain is increasing.[7] It is possible to achieve this important case in the treatment centers typically through general anesthesia (GA) or sedation, and of course, these factors reduce the patient's awareness and activity and, as a result, reduce the decision-making capacity and the necessary cooperation to provide the necessary information.[8] Often, midazolam acts as a selective sedative to facilitate the use of TEE.[9] Midazolam is a short-acting benzodiazepine that can provide anti-anxiety, relaxation, pain relief, and relaxation of the muscle.[8] However, midazolam can increase some potential complications, such as excessive relief, as a result, confusion, instability, dizziness,[8,10] significant hemodynamic stimulation, and respiratory depression.[11]

The fact is that only a few patients undergoing TEE receive formal education to recognize the advantages and disadvantages of sedation.[9] The lack of knowledge and awareness can be directly related to the level of their anxiety.[12] Anxiety causes irritability, agitation, and an increase in some physiological parameters such as heart rate and blood pressure and the release of catecholamines, which subsequently increases the need for myocardial oxygen.[13] The results of a review study suggested that nondrug interventions could even reduce the need for sedation and GA in invasive procedures.[14] Methods such as hypnosis, self-relaxation training, and cognitive-behavioral intervention have been successfully introduced to reduce pain and anxiety associated with many medical diagnostic methods.[15] Some of the methods of preparation, including music therapy, peer training, (two-hour sessions, two consecutive days) and multimedia training (Use the DVD for 15 minutes before doing bond-up appointment), can also be useful in this area.[16-18]

According to the results of the studies, as training of the patient is time-consuming and as a result of the shortage of nursing staff,[19-21] multimedia (video, animated pictures, etc.,) using more than one medium of expression or communication training can be used as a convenient and cost-effective way to train patients.[22] By combining audiovisual information, the film is an effective learning tool for acquiring awareness and reducing anxiety for patients, and it also facilitates easy understanding and maintenance of information by patients.[17] Another type of training method for patients that is effective in facilitating and promoting health and creating an environment for learning is peer training.[23] Peer training improves interpersonal interaction; in fact, the peer acts as a connector between patients and health-care professionals.[24,25]

Considering the usefulness of multimedia training and peer training to reduce the anxiety of patients, the researcher aimed to compare the effect of two training methods of multimedia (multimedia training) and peer training on the anxiety of TEE applicants in order that one of these methods can be selected as a nonpharmacological method effective in reducing anxiety in a pre-TEE nursing care program for patients.

## MATERIAL AND METHODS

This is a randomized, controlled clinical trial registered with IRCT20141026019677 N6 at the Center for Clinical Trials and approved by the Ethics Committee of Mazandaran University of Medical Sciences at IR.MAZUMS.REC.1397.1178. This study was conducted on 46 outpatients admitted at the TEE Unit of Fatemeh Zahra Hospital, Sari, affiliated to the Mazandaran University of Medical Sciences, from May to July 2018. The inclusion criteria for the study include having at least 18 years of age, doing TEE for the first time in a nonemergency manner, the patient's willingness to participate in the project and signed a informed consent form, having at least reading and writing skills (elementary education), lack of any cognitive, vision, or hearing impairment, being able to speak and understand Persian language, having no addictions, lack of medical diagnosis of prior depression and anxiety disorders (with information written in the form of individual and medical information as well as self-declaration of patients), and lack of sedation therapy 3 h before the TEE. The exclusion criteria included prior history of TEE, addictions, Age under 18 years, cognitive and Visual, auditory impairment having medical education or related to it, medical diagnosis of prior depression and anxiety disorders (with information written in the form of individual and medical information as well

as self-declaration of patients), lack of satisfaction to continue working with the researcher, and illness or death of the patient. Block random allocation was performed to select the desired groups. To prevent bias and data contamination, the start of the sampling per week was subject to the TEE of all units under investigation in the past week; and if one of the units was not discharged, sampling was done until the time she did not work. Considering the activity of three physicians in the TEE unit, all three physicians collected samples from patients per week. Sample size according to previous studies[26] with a confidence coefficient of 99%, a test power of 95%, was determined using the sample size determination formula for each group of 11 (a total of 33 people). To increase the accuracy, the total sample size was 45 people (15 persons per each group), which was increased.

The intervention in one group was peer training . Two patients (a 23-year-old female and a 30-year-old male) were selected among patients who had successful TEE and no complications. Peer profile included volunteering, having a minimum degree of education, and having appropriate social and communication relationships. Then, peers were trained by holding 2-h training sessions. The location of these meetings was the Mazandaran Heart Center, and the peer training methods were lecture and question-and-answer methods. So that in the first session, peers were trained around the concepts such as the importance and advantages of the peer; strategies for reducing anxiety such as deep breathing, music, sports, and reading; communicative skills such as attention to nonverbal behaviors; and the ability to actively listen and send clear communication messages, and they were asked to recite their experiences and the researcher completed them, so that the peers could pass them on to patients during training sessions. In the second session, descriptions of the requirements before and after the TEE and the process of performing the procedure and possible complications were given to the peers. To ensure that the peers are ready, the researcher examined the items taught during the previous session using the checklist, and if the peer dominated the educational items, the coefficient of educational skills agreement between two peers was measured through the kappa coefficient of agreement using SPSS V25 and then the peers allowed to enter the next stage (training patients). A booklet was prepared for them to review and avoid forgetting materials and unify learned items. Gifts were donated to the peers after the meeting. In the peer group, one day before the TEE, the training was conducted through lecture and question-and-answer method in addition to the routine training at the TEE clinic (educational brochure) by the peers in the groups of 3–5, for 1 h in the presence of a researcher in the clinic of Mazandaran Heart Center. One day before performing the TEE at Mazandaran Heart Center Clinic, the multimedia group patients in groups of 3–5 provided with an educational CD for 7 min and 12 s with the content of the introduction and the necessity of the TEE diagnostic method, the procedure, the possible complications, and the necessary care before and after TEE. After the film was finished, some questions and answers have been mentioned between the patients and the researcher for 10 min. It should be noted that the content of the educational film was based on books, websites, and valid articles of medicine and nursing, which was approved by heart doctors and professors. The control group received routine training in the TEE clinic (educational brochure) as well as the researcher's verbal training. To collect data, two tools were used: the checklist of the patient's personal and medical profiles consisted of two parts – the first part was some questions on personal characteristics of patients including gender, age, marital status, education, occupation, place of residence, the ability to speak and understand Persian, membership in health-care team, and addiction and the second part included information on the history of TEE, the use of sedative medication 3 h before the TEE, prior history of depression and anxiety disorder, history of cognitive, vision, and hearing impairment, and drug use (beta-blocker, cortisone, and thyroid drugs). The second tool was Spielberger's State-Trait Anxiety questionnaire. The questionnaire contained twenty multichoice questions with very low, low, high, and very high options. The following guidelines are recommended for the interpretation of scores: 20–31, mild anxiety; 32–42, mild-to-moderate anxiety; 43–53, moderate-to-high anxiety; 54–64, relatively severe anxiety; 65–75, severe anxiety; and >75, extremely severe anxiety.[26] Persons who had a mild anxiety score[20-31] and an extremely severe anxiety (>75) were excluded from the study using the Spielberger questionnaire. The reliability of the Spielberger questionnaire was measured by a study entitled "*Spielberger Normalization*" by Mahram (2000). The Cronbach's alpha in the norm society was 0.9452 and in the criterion society was 0.9418.[28] Its validity and reliability have also been confirmed in other studies.[29,30]

To assess the anxiety of the patients, Spielberger questionnaire was performed one day before TEE (immediately before the training) at the Fatemeh Zahra Heart Clinic in Sari and the second time one hour before the TEE was performed in the Patient Readiness Room for Blinding (not waiting for patients) at TEE clinic, by patients filled up. A psychiatric nurse also supervised the patient's anxiety measurement. It should be noted that the researcher did not have any role in filling out the questionnaires. After collecting data, data analysis was performed using SPSS-25. Descriptive statistics (mean and

standard deviation) were used to describe the participants' characteristics and their anxiety. Paired *t*-test, Chi-square statistical test (for qualitative characteristics), and *post hoc* test were used to compare groups two by two. It should be noted that the consultant did not know the belonging of any patients to the relevant groups.

## RESULTS

The results of the study showed that most of the patients in these three groups were female, married, and middle-aged; had an elementary education (under the diploma); and were the residents of the city. Chi-square statistical test showed no significant difference in terms of demographic and medical characteristics such as age, sex, marital status, education, occupation, place of residence, and history of angiography. Thus, three groups were homogeneous [Table 1].

The mean scores of anxiety before training were 44.6 ± 2.2, 46.1 ± 2.7, and 46.5 ± 2 in the peer group, multimedia group, and control group, respectively. The mean difference of anxiety before training in the three groups was not statistically significant ($P = 0.826$). As a result, the three groups were homogeneous in terms of the mean score of anxiety before training. The mean scores of anxiety in the peer group, multimedia group, and control group after the intervention were 42.2 ± 3.3, 41.6 ± 2.6, and 47 ± 7, respectively. The mean difference before and after training in peer group ($P = 0.451$), multimedia group ($P = 0.185$), and control group ($P = 0.826$) was not statistically significant. ANOVA results showed that in both peer training and multimedia training, the anxiety score of patients was reduced compared to before intervention, but this difference was not statistically significant in comparison with the control group ($P = 0.354$) [Table 2].

## DISCUSSION

The results of this study showed that both educational methods by peer and multimedia groups can reduce the anxiety of TEE applicants, but the mean score of anxiety

**Table 1: Frequency distribution of personal and medical characteristics of transesophageal echocardiography applicants in two intervention groups and control group**

| Variable | Group | | | Test results |
|---|---|---|---|---|
| | Control group, *n* (%) | Peer group, *n* (%) | Multimedia group, *n* (%) | |
| Gender | | | | |
| Male | 7 (50) | 8 (50) | 6 (37.5) | 0.720 |
| Female | 7 (50) | 8 (50) | 10 (62.5) | |
| Age | | | | |
| Young (18-45 years old) | 1 (7.1) | 4 (25) | 9 (56.3) | 0.052 |
| Middle aged (46-65 years old) | 9 (64.3) | 7 (43.8) | 5 (31.3) | |
| Elderly (65 years and older) | 4 (28.6) | 5 (31.3) | 2 (12.5) | |
| Education | | | | |
| Under the diploma | 9 (64.3) | 8 (50) | 5 (31.3) | 0.504 |
| Diploma | 3 (21.4) | 5 (31.3) | 7 (43.8) | |
| Academic | 2 (14.3) | 3 (18.8) | 4 (25) | |
| Marital status | | | | |
| Single | 1 (7.1) | 1 (6.3) | 1 (6.3) | 1.0 |
| Married | 12 (85.7) | 14 (87.5) | 14 (87.5) | |
| Widow or widower | 1 (7.1) | 1 (6.3) | 1 (6.3) | |
| The place of residence | | | | |
| City | 12 (85.7) | 13 (81.3) | 11 (68.7) | 0.499 |
| Village | 2 (14.3) | 3 (18.8) | 5 (31.3) | |
| Consuming drugs | | | | |
| Beta-blocker | 7 (50) | 3 (18.8) | 1 (6.3) | 0.038 |
| Beta-blocker and thyroid | 1 (7.1) | 1 (6.3) | 0 | |
| Thyroid | 1 (7.1) | 0 | 0 | |
| No drug intake | 5 (35.7) | 12 (75) | 15 (93.8) | |
| Occupation | | | | |
| Employee | 4 (28.6) | 2 (12.5) | 3 (18.8) | 0.640 |
| Unemployed and retired | 6 (42.9) | 7 (43.8) | 8 (50) | |
| Housewife | 1 (7.1) | 1 (6.3) | 0 | |
| Worker | 2 (14.3) | 6 (37.5) | 3 (18.8) | |
| Self employed | 1 (7.1) | 0 | 2 (12.5) | |
| The history of performing angiography | | | | |
| Yes | 3 (21.4) | 3 (18.8) | 0 | 0.155 |
| No | 11 (78.6) | 13 (81.3) | 16 (100) | |
| Time (weeks) | | | | |
| <2 | 14 (100) | 13 (81.3) | 13 (81.3) | 0.315 |
| 2-4 | 0 | 3 (18.8) | 2 (12.5) | |
| >4 | 0 | 0 | 1 (6.3) | |

**Table 2: Comparison of mean and standard deviation of anxiety of transesophageal echocardiography applicants before and after the intervention, into two control and intervention groups**

| Groups | Peer | Video multimedia | Control | *P* |
|---|---|---|---|---|
| One day from TEE intervention | 44.6 ± 2.2 | 46.1 ± 2.7 | 46.5 ± 2 | 0.826 |
| One hour before TEE | 42.2 ± 3.3 | 41.6 ± 2.6 | 47 ± 7 | 0.354 |
| *P* | <0.05 | <0.05 | <0.05 | |

TEE: Transesophageal echocardiography

before the intervention was not significantly different in the three groups. The study conducted by Najafi *et al*. on "*Effect of music on the level of anxiety and vital signs of TEE applicants*" showed that there was no significant relationship between mean score of anxiety before intervention in the test group and control group.[26] These findings are consistent with the results obtained by several previous studies.[31,32]

The results of this study also showed that the use of peer group and multimedia group in reducing the anxiety of TEE applicants was not significantly different compared to the control group. The study conducted Jong *et al*. entitled "*The Effects of Guided Imagery on Preoperative Anxiety and Pain Management in Patients Undergoing Laparoscopic Cholecystectomy in a Multi-Centre RCT Study*" also showed that there was no significant difference in preoperative and postoperative anxiety and no significant change was observed in VAS scores.[33] The findings of this study are consistent with the results of the study conducted by Yeganeh Khah *et al*. on "*Comparison of Different Methods of Education on Reducing the Anxiety of Patients with Myocardial Infarction*."

The results of this study showed that there was no significant difference between educational methods in reducing apparent anxiety in patients.[29] The results of this study were compared with the results of Moemeni *et al*. aimed at "*Comparing the Effects of Various Educational Methods with Film and Instruction Booklet on Preoperative Anxiety in Patients Undergoing Coronary Artery Bypass Graft Surgery in Two Different Time Periods*."[34]

The results of this study showed that training using film the day before surgery did not affect anxiety of patients but 6 days before surgery reduced anxiety. Probably, when the patient is undergoing a preparation for a therapeutic or diagnostic operation, experiences the highest levels of anxiety and stress, and the patient may not be able to express his or her true feelings at that moment, so measuring anxiety 1 h before performing TEE affected the results. The results of the study conducted by Günay *et al*. entitled "*Impact of Multimedia Information on Bronchoscopy Procedure: is it really Helpful*?"[35] were not consistent with the present study. Reduction in anxiety score, greater satisfaction, fewer problems during bronchoscopy, and decreased midazolam dose, and finally reduced bronchoscopy duration in the multimedia group. In Gunay's study, patients who had a history of bronchoscopy or endoscopy also entered the study, while in the present study, one of the exclusion criteria was the history of TEE. The experience of a diagnostic intervention can reduce the patient's fear and anxiety, and furthermore, in the above study, the film was watched on the same day just before performing the bronchoscopy, and the questionnaires were filled two times immediately before and after watching film, while in the present study, the film was presented the day before TEE, and the questionnaires were filled with a time interval of 2 days at admission day and the day of TEE. This time interval can affect the patient's anxiety score. This study is not consistent with the study conducted by Molazem *et al*. entitled *"Effects of a Peer-Led Group Education on Fear, Anxiety and Depression Levels of Patients Undergoing Coronary Angiography*."[36] In this study, patients hospitalized for undergoing coronary angiography were studied. The hospitalization of patients in the department for getting ready, being familiar, and interacting with the environment may reduce the levels of patient's anxiety, while the patients attending the present study were referred to the outpatient clinic, and after a short period of time, they underwent TEE. On the other hand, the darkness of the environment and the fact that they will receive anesthetic drugs before they perform TEE can also increase their anxiety.

## CONCLUSIONS

According to the results of this study and comparison of the mean score of anxiety in the three groups, there was no difference between the mean scores before and after the intervention in the control group, while in the multimedia and peer group, this difference was significant, although it was not statistically significant. There was no significant difference between the mean scores of anxiety in both intervention and control groups. Considering the studies confirming the relationship between education and the reduction of patient anxiety and also the interest of patients in education, changing the method and type of education before TEE can significantly reduce the anxiety of patients. The limitations of the study were that only the trait anxiety level has been measured and it is possible that the difference in state anxiety in patients affects their anxiety levels. Therefore, it is suggested that the normal and state anxiety of the patient is also measured. Moreover, the personal and social differences of patients and the low literacy of the majority of patients participating in the study can affect the responses to the questions of the Spielberger questionnaire; therefore, it is suggested that in

the next studies, another measurement tool such as anxiety visual test should be used.

## Conflicts of interest

There are no conflicts of interest.

## Author contribution

All authors contributed to this research.

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