Possible Effect of Video and Written Education on Anxiety of Patients Undergoing Coronary Angiography

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Purpose: *The aim of this study was to investigate possible effects of video and written education on anxiety of patients undergoing coronary angiography.*
Design: *The study design was quasi-experimental.*
Methods: *This randomized controlled semitrial model included patients who underwent coronary angiography between October 2015 and May 2016 at the Department of Cardiology of a university hospital. The number of subjects determined by power analysis was 90 patients in three groups. Written education, video education, and control groups were included. Data were collected using personal information forms, State-Trait Anxiety Inventory, and physiological variables.*
Findings: *There was a statistically significant difference in the mean scores of state anxiety, satisfaction, and physiological variables after education, compared with baseline, in both patient and control groups (P < .005).*
Conclusions: *Our study results suggest that education given by the nurse before the procedure reduces level of anxiety and affects physiological variables positively.*

Keywords: *coronary angiography, anxiety, video education, written education.*
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CARDIOVASCULAR DISEASES (CVDS) are major health problems that threaten human health today. Coronary artery disease (CAD) is the most common type of CVD.[1-3] According to the World Health Organization, it is estimated that there were 15.8 million individuals with CAD in 2010, which is expected to increase up to 23 million by 2030.[4] According to statistics from Turkish Republic Ministry of Health, CVDs are responsible for 37% of deaths in people younger than 70 years.[5,6]

In the diagnosis and treatment of CAD, coronary angiography (CAG) is frequently used. However, it leads to anxiety in patients because of reasons such as fear of death, which is common in heart diseases. In particular, the CAG procedure causes anxiety in people who have never experienced this practice before.[7,8] As the anxiety affects treatment process of the individual before the procedure, the anxiety status of patient should be assessed.[9] Health education, an important aspect of nursing care, helps a patient adjust to disease processes, maintain recommended treatments,

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and solve problems that arise in new situations. Pre-procedural education in the CAG unit would also reduce the level of anxiety, prevent possible complications, and accelerate the recovery.[10,11]

A suggestion in the literature is that education is an effective method to relieve anxiety before and after the procedure.[7-13] In the study conducted by Balcı and Enç,[14] anxiety levels of patients decreased with audiovisual education. In another study, Hoseini et al[15] showed that the education of patients reduced anxiety after the procedure. It is thought that the education given to patients before the CAG procedure will help reduce the anxiety of the patient, ease the procedure, and help in the rapid recovery process. Therefore, in the present study, we aimed to investigate possible effects of video and written education on anxiety of patients undergoing CAG.

The Study Hypotheses

H_0: The education given before the CAG procedure does not affect the anxiety of the patients.

H_1: Video education before CAG treatment reduces the anxiety of patients.

H_2: Written education before CAG procedure reduces the anxiety of patients.

Materials and Methods

Type and Place of Study

The study was conducted with a randomized controlled semitrial model to investigate possible effects of video and written education on the anxiety of patients undergoing CAG. The study was conducted at the Department of Cardiology of a university hospital.

Study Population and Sample

The study population consisted of patients who underwent CAG at the Department of Cardiology of a university hospital between October 2015 and May 2016. The study sample had a total of 90 patients from selected population as three groups, including written education, video education, and control (routine application) groups in which there were 30 individuals after the number

of each group was determined by power analysis. In addition, they were determined from the selected population using block randomization, matching the sample criteria and voluntarily agreed to participate in the study.[16]

Inclusion criteria were as follows: aged 18 years or older, no communication problems, the first time to undergo CAG, and fluency in Turkish. Participation was voluntary, and participants had no psychiatric or mental illness.

Data Collection Instruments

PERSONAL INFORMATION FORM. In accordance with the literature data, the personal information form (PIF) was prepared by the researcher and included 15 questions about patients. These questions related to the patient's age, gender, number of children, educational status, marital status, income status, profession, family structure, residency, and willingness to receive information about CAG, hospitalization history, surgical history, family history about CAD, and continuous drug use history.[7,14,17,18]

STATE-TRAIT ANXIETY INVENTORY. Spielberger et al[19] developed the State-Trait Anxiety Inventory (STAI). In the STAI, the score greater than 42 is considered as high anxiety level. Validity and reliability studies were conducted in Turkish by Öner and Le Compte,[20] and the Cronbach's α coefficient of the scale was found to be 0.94-0.96. The Cronbach's α values of the scale in our study were 0.91 and 0.81 for pre-education STAI and preservice continuity anxiety scale, respectively, whereas they were 0.92 and 0.90 for posteducation STAI and postprocedural STAI, respectively.

Data Collection

The elective CAG procedure was performed from 8:00 a.m. to 5:00 p.m., the working hours on weekdays in the clinic. For this reason, research data have been collected during these periods and between October 2015 and May 2016. The data were collected using the face-to-face interview technique (Figure 1).

In this training process, the aim was to provide information by searching the related literature about

the CAG process. This information was given by the researcher who was the education nurse in the appropriate environment. This appropriate environment was created in the nurse's room in the office visit where patients are examined on the first day. This appropriate environment was created in the patient's room on the second day. In addition, patients went directly to the angiography laboratory from the rooms in the clinic before the procedure. After the procedure, they came directly from the angiography laboratory to the rooms in the clinic. For these reasons, the researcher who is an education nurse increased duty to provide information.

The patients are hospitalized for 2 days for CAG. The definition of first day is the office visit where the patient came for the examination, and the CAG decision was made. The second day was the day of the CAG process. We gathered the data (physiological variables, PIF, and STAI) on the first day and called it *collecting pre-education data* and then gave the groups information about CAG (written and video education groups and control group). On the second day, we collected the data (physiological variables, the State Anxiety Scale) before going into the CAG process, which was collecting *posteducation (preprocedural CAG) data*. After the second day of CAG treatment, the patients again collected their data (physiological variables, the State Anxiety Scale), which was *collection of post-CAG process data* (Figure 1).

COLLECTING PRE-EDUCATION DATA. *Written Education Group.* After the written education group was evaluated in the outpatient setting on the first day, pre-educational physiological variables were measured; PIF and STAI were applied by the researcher, and written education was performed with the brochure based on the results. This brochure was developed by the researcher in accordance with the literature data, including information about the structure of the heart and its function, CAD, CAG operation, and applications before, during, and after the procedure.[1,2,6,7,11,13-16,21,22]

Video Education Group. After the video education group was evaluated in the outpatient setting on the first day, pre-educational physiological variables were measured; PIF, STAI, and video pre-

sentation were applied by the researcher. This video presentation was made by the researcher in accordance with the literature data, including information about the structure of the heart and its function, CAD, CAG operation, and applications (related to CAG operation) before, during, and after the procedure. The video was shot with the camera device in the clinic where the work was done, and the video was voiced by the researcher in keeping with the information contained in the brochure.[1,2,6,7,11,13-16,21,22]

Control Group. The control group was evaluated in the outpatient setting on the first day, then the pre-education physiological variables were measured; STAI and PIF were administered. Unlike the other groups, no education/application other than clinical routine information application was performed. In clinical routine data practice, verbal information about the procedure was provided by the physician who made the CAG decision to the patient in the outpatient setting, and on the day of the procedure, verbal information was given by the nurses and physicians in the patient's room.

COLLECTING POSTEDUCATION (PREPROCEDURAL CAG) DATA. On the first day, physiological parameter measurement, training, and clinical routine information applications were made in office visits. Then, on the second day, they were admitted to the daily patient and cardiology services. Then, the physiological parameters were measured before entering the CAG procedure of the groups, and the State Anxiety Scale was applied.

COLLECTION OF POST-CAG PROCESS DATA. After the CAG process was done and the participants' conditions were stabilized, postprocedural physiological variables were measured. The STAI was also given at this time.

Nursing Initiative Materials Performed to the Education Groups

The CAG patient information brochure and CAG patient information videos were prepared by the researcher. The content of the video and brochure prepared in the direction of the literature was the same. Our brochures were prepared in a clear and colorful way with the aid of a graphic designer. The
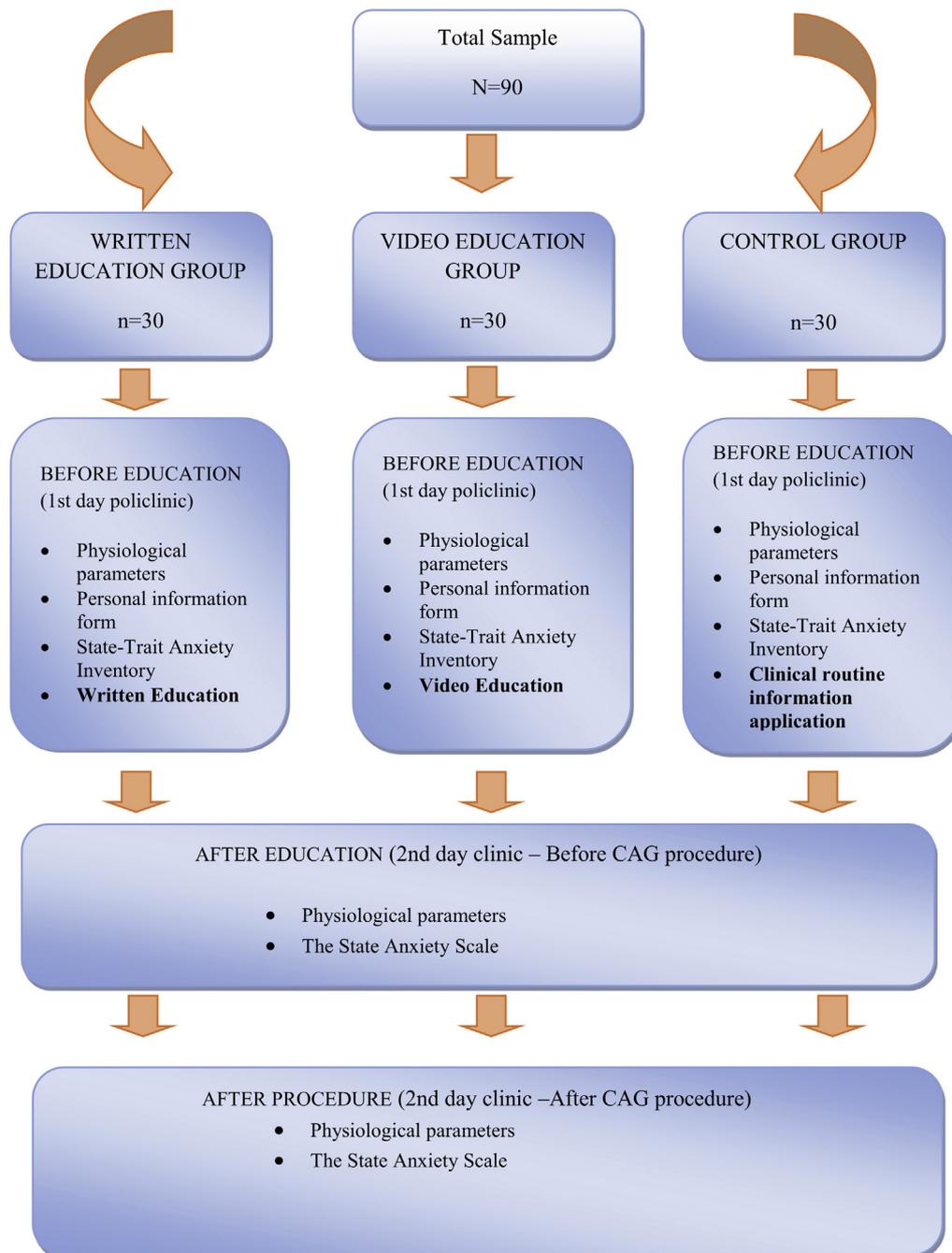
Figure 1.   Research application plan. CAG, coronary angiography. This figure is available in color online at www. jopan.org.

education videos were drawn to the in-process area. Thus, patients had information about the area before the procedure. In accordance with the results of the research, these educational materials continue to be actively used in our clinic. The researchers believe these improved applications will make their own clinic more noteworthy, as well as provide unique tools for other nurses, clinics, and patients. See Box 1 for the main education topics contained in the brochure and video.

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Box 1. The Main Education Topics Included in the Brochure and Video

- Introduction
- What is the coronary angiography (CAG)?
- The risks of CAG process
- Preparations before CAG
- Points to consider after CAG procedure
- Discharge education after CAG
- References

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Ethical Aspects of the Research

The study protocol was approved by the Ethics Committee of University (decision of 28 dated July 3, 2015) and Faculty of Medicine Hospital University (no. 54,428 of August 20, 2015). A written informed consent was obtained from each participant. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical Analyses

Statistical analyses were performed using the SPSS, version 20.0 software (IBM Corp., Armonk, NY). Categorical measures and percentages were summarized as mean and SD (where necessary, median and minimum-maximum) for numerical measurements. The χ^2 test, one-way analysis of variance, Scheffe's and Tamhane's tests, and repeated-measures analysis were used for the evaluation of the statistical data. A P value of $< .05$ was considered statistically significant.

Results

The mean age of the written education group was 55.6 ± 10.8 years, whereas it was 60.6 ± 9.2 years for the video education group and 57.4 ± 12.5 years for the control group ($P > .05$). There was no statistically significant difference in the descriptive characteristics among the groups ($P > .05$).

Possible effect of education on physiological variables was also examined. There was no significant difference in the systolic and diastolic blood pressures among the groups ($P > .05$), whereas there was a statistically significant difference in the intragroup analysis after written and video education ($P < .05$). Post-treatment respiration ($P = .030$) and postoperative pulse rate ($P = .035$) were also found to decrease favorably among the groups in the study. In addition, the number of respirations after education in the groups decreased significantly in favor of the video education group, whereas the number of pulse after education in the groups decreased significantly in favor of the video education group ($P < .05$) (Table 1).

There was no statistically significant difference in the mean STAI scores of the pre-education groups in the study ($P > .05$). However, there was a statistically significant difference in the mean scores of posteducation (pre-CAG procedure) and postprocedural STAI among the groups ($P < .05$). There was also a statistically significant difference in the mean scores of STAI before and after the education and after the procedure among the written and video education and control groups ($P < .05$). In addition, the mean state anxiety score (41.67 ± 4.73) for video education group was lower than that of the written education group (44.23 ± 3.97) (Table 2).

Discussion

In the present study, there was no statistically significant difference among the groups included in the study in terms of descriptive characteristics, indicating that all groups were homogeneous. The demographic characteristics of the patients were also similar to previous studies in the literature.[8,9,13-15,17,23] Positive effects of education on the physiological variables were found in the present study, consistent with previous studies in the literature.[14,18,24-26]

Kurçer and Özbay[18] reported that education and counseling of post-CAD lifestyle reduced the mean of diastolic and systolic blood pressures. Basar et al[24] also evaluated the efficacy of video education for CAG in patients on anxiety and physiological variables and found that pulse rate, systolic blood pressure, and diastolic blood pressure values immediately before the procedure were significantly lower. In addition, Hajbaghery et al[25] developed a multimodal package program containing educational brochures and videos for the patients before CAG, and they examined whether these documents would be effective for improving patients' vital signs. Eventually, the authors found that there was a decline in the pulse

Table 1. Comparison of Physiological Variables of the Groups

	Written Education Group (n = 30)	Video Education Group (n = 30)	Control Group (n = 30)	
	Mean ± SD			P
SBP before education	132.83 ± 16.90	136.33 ± 22.04	129.67 ± 19.20	.419
SBP after education	128.20 ± 18.48	127.97 ± 17.61	133.67 ± 12.72	.321
SBP after the procedure	124.60 ± 16.78	128.93 ± 14.46	131.33 ± 15.69	.247
P (intragroup)	**< .001***	**.010***	.357	
DBP before education	81.33 ± 11.88	84.97 ± 13.59	79.17 ± 12.60	.209
DBP after education	76.90 ± 10.66	80.33 ± 10.66	78.97 ± 10.65	.458
DBP after the procedure	75.20 ± 10.70	79.63 ± 11.74	80.00 ± 10.50	.176
P (intragroup)	**.003***	**.017***	.854	
Respiration before education	19.53 ± 1.63	20.33 ± 1.66	19.80 ± 1.51	.152
Respiration after education	19.40 ± 1.90	19.93 ± 1.92	20.67 ± 1.60	**.030***
Respiration after the procedure	19.00 ± 2.08	19.07 ± 2.08	19.87 ± 1.81	.180
P (intragroup)	.199	**.001***	**.014***	
Pulse rate before education	84.10 ± 10.57	85.43 ± 12.31	82.13 ± 10.04	.509
Pulse rate after education	78.37 ± 11.14	83.30 ± 11.23	83.10 ± 7.61	.109
Pulse rate after the procedure	77.63 ± 11.73	84.93 ± 10.75	80.53 ± 9.85	**.035***
P (intragroup)	**< .001***	.279	.304	

SBP, systolic blood pressure (mm Hg); DBP, diastolic blood pressure (mm Hg).
NOTE. Boldface indicates statistical significance.
*P < .05.

rate, systolic blood pressure, and diastolic blood pressure.[25]

Considering the STAI scores before education, all groups were similar in terms of the mean continuous anxiety scores. The mean scores of the groups showed high level of pretraining anxiety measures, consistent with the previous study findings.[8,12,17,24-26] Jamshidi et al[27] also reported that the patients waiting for CAG had a high level of anxiety, and the patients must be informed about the procedure. Therefore, the authors concluded that nurses played a key role in this process.

In addition, there was a statistically significant difference in the mean posteducation (pre-CAG procedure) STAI scores among the groups, consistent with the previous studies using preprocedural patient education method.[7,13-15,24] In one study, Mirsane et al[28] found that anxiety decreased with preprocedural video education.

Table 2. Comparison of Mean of the State-Trait Anxiety Scores of Groups

	Written Education Group (n = 30)	Video Education Group (n = 30)	Control Group (n = 30)	
	Mean ± SD			P
The Trait Anxiety Scale before education	43.33 ± 5.75	43.03 ± 5.24	40.43 ± 7.20	.137
The State Anxiety Scale before education	51.57 ± 5.84	51.13 ± 5.95	50.47 ± 7.98	.813
The State Anxiety Scale after education (before CAG procedure)	44.23 ± 3.97	41.67 ± 4.72	48.57 ± 8.08	**< .001***
The State Anxiety Scale after CAG procedure	36.97 ± 5.14	34.70 ± 3.68	38.60 ± 8.15	**.044***
P (intragroup)	**< .001***	**< .001***	**< .001***	

CAG, coronary angiography.
NOTE. Boldface indicates statistical significance.
*P < .05.

According to the mean STAI scores after CAG procedure, the difference among the groups was found to be statistically significant, and the STAI scores of the written and video education groups decreased more than those of the control group. Because of the decreasing effects of written and video education groups on anxiety as can be seen in several studies in the literature and the termination of the patient's treatment, particularly for the control group, we found that the postprocedural STAI scores decreased significantly. The low STAI scale score after written and visual education shows that education reduces the anxiety level of the patients.[7,8,14-16,26,27]

In the intragroup analysis, the difference within each group was found to be statistically significant, and the STAI scores of the education groups had a higher significant decline than the control group, indicating that the education was important, as reported in the literature.[23-25,28,29]

In addition, the mean STAI scores of the video education group (41.67 ± 4.73) were lower than that of the written education (44.23 ± 3.97). This can be attributed to both visual and auditory characteristics of the method. Habibzadeh et al[8] reported that the patients were displayed video education films for educational purposes and achieved positive effects. Ayasrah and Ahmad[21] suggested that video education applied for reducing anxiety was more effective. Similarly, Uyanık[22] investigated the effects of video education versus traditional education on learning skills and argued that more use of video education as a part of teaching techniques might be beneficial. In the study related to the level of anxiety as an important factor for the patients monitoring in the Department of Cardiology, Haddad et al[16] showed that there was a decline in the mean anxiety scores of patients in the video education group.

All these studies supported our findings. Patients felt anxious about unknown sides of the diagnosis and the process procedure. These results supported the H_1 and H_2 hypotheses of our research. Video and written education before CAG treatment reduces the anxiety of patients.

The strength of our study is that it has three groups and is versatile evaluation. The limitation of this study is that the results of this study cannot be generalized to all patients undergoing CAG or to all Turkish patients.

Conclusion and Implication for Nursing Practice

In conclusion, based on our study results, video and written education provided before the procedure by nurses to the patients undergoing CAG decreased state anxiety. Furthermore, this approach affected physiological variables positively and increased patient satisfaction in this sample population. Accordingly, we suggest that education protocols should be established to reduce the state-trait anxiety levels of the patients who are scheduled for CAG, to plan the education before, during, and after the procedure according to the requirements of each patient, to support the use of this information in nursing care, and to make it a part of its education applications.

Nurses who specialize in education tend to work daytime hours. As the patients are resting at night, they are more easily reached in the daytime conditions and with more efficient education completed. Preprocedural education should be conducted in an environment where patients feel comfortable. The nurse as a researcher plays a role in the education process. Mutual interview training is given to the patients in a trust environment. The researcher also presents oral instructions when using nurse training materials. The training materials prepared by the researcher were delivered to the working nurses and used by those nurses. For example, patients are allowed to ask questions. Sections that are not well understood by the patient are explained again. It should be verified that the information given is clearly understood. The patients should be approached in an empathetic and protective manner, improving successful conveyance of knowledge and understanding.

Acknowledgments

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