



General

The effect of an information brochure on patients undergoing cardiac catheterization on their anxiety, knowledge and fear: A randomized controlled study.

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Introduction

Patients who undergo coronary angiography experience a rather stressful situation. They need information about this invasive procedure which most of the times find either from the internet, their referring physicians, acquaintances or friends with past experience of an invasive procedure.

Aim

The aim of the study was on the one hand to test the potential beneficial effects of an information brochure on undergoing a cardiac catheterization for the first time and on the other hand to highlight the importance of informing patients before coronary angiography and its beneficial effects on both reducing their fear and anxiety.

Methods

Patients were randomly assigned to an experimental group receiving the brochure at least 1 day before the cardiac catheterization (N = 44), or to a control group not receiving the brochure (N = 44). The SFQ, ISQ and STAI tools were distributed to both groups.

Results

All experimental subjects in the intervention group read the brochure. The intervention group had significantly lower scores on both short-term and overall fear compared to the control group. However, the fear of the long-term consequences of cardiac catheterization was similar in both groups. Women had higher fear of the short-term consequences of catheterization than men. The control group experienced a mean satisfaction score of 10.9 points (SD= 2.5 points) while the intervention group had a score of 11.1 points respectively (SD= 2.3 points). In addition, 95, 5% of the control group and 88, 6% of the intervention group patients considered that the provision of information could have been improved. In terms of stress, patients with co-morbidities scored 7.39 points higher, meaning they experienced more symptoms of permanent anxiety, compared to patients who did not have an underlying disease. In addition, the more the patients were satisfied with the information provided, the fewer the symptoms of transient anxiety they experienced.

Conclusions

Providing information in the form of a brochure regarding cardiac catheterization before the procedure, is of great importance and constitutes an efficient intervention.

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BACKGROUND

The day of the coronary angiography is very important and at the same time stressful for a patient. Through the extensive review of the literature, the importance of informing patients before they undergo invasive cardiac catheterization is highlighted.^{1,2} A very useful and easy way to inform patients is to use a printed brochure with valid, accessible, and comprehensive information for each patient. This information assists the patient to ease symptoms of anxiety, stress, and fear that may be caused by a lack of specialized knowledge of evasive screening medicine, as well as answering questions and queries that they may have. These feelings are created both by the uncertainties and insecurities associated with the diagnosis of the disease and by the invasive nature of the procedure.

The aim of the present study was to test the potential beneficial effects of an information brochure on undergoing cardiac catheterization for the first time and to highlight the importance of informing patients before coronary angiography and the beneficial effects it has on both reducing their fear and anxiety, in a randomized controlled design with one experimental and one control group. More specifically the following hypothesis was tested: Patients receiving the information brochure experience less anxiety and fear just before and during the medical examination than patients not receiving the information brochure.

METHODS

A stratified randomization procedure with respect to the variable sex was used in order to increase internal validity. This meant that within each specified group, a table containing the numbers '0' and '1' in random order, determined to which group the subject was assigned. As a result, patients were randomly assigned to an experimental group receiving the brochure before the cardiac catheterization ($N = 44$), or to a control group not receiving the brochure ($N = 44$). The brochure was a 4-page leaflet that had information about cardiac catheterization, the process according to the medical protocol of the hospital, and possible complications.

Oral standard information was provided to all by a hospital nurse while the brochure was given only to the intervention group. All staff members involved were blind with respect to conditions. Participants of both groups were assessed before the procedure on hospital admission. On the day of catheterization, each participant in both groups was assessed to identify their problems, knowledge, fear level, and anxiety level before and after the procedure.

ETHICAL CONSIDERATIONS

The specific research was carried out at the Army Share Fund Nursing Institution. Approval for the study was obtained from the ethical committee of this hospital. It was conducted on patients of the cardiology clinic who were preparing for coronary angiography. All participants of the study were older than 18 years, fluent in Greek, they had already booked an appointment for cardiac catheterization,

and the latter would be their first experience for them. The participants were informed about the aim of the study, the measures that the research team has taken in order to protect their anonymity, and their participation was voluntary.

MEASURES

The research tools for the study at hand were the fear questionnaire for invasive cardiac catheterization (adapted according to the SFQ), the Information Satisfaction Questionnaire (ISQ), and the stress questionnaire (temporary and permanent) STAI. These tools were accompanied by the collection of a number of patient demographic and cognitive characteristics in association with the data produced by the three aforementioned research tools. For the 2 questionnaires, ISQ and SFQ, internal consistency reliability tests were performed. Cronbach's alpha (α) was calculated for this purpose. The values of the index that are above 0.70 are considered satisfactory. At the end of this survey, the coefficient value for the ISQ questionnaire was 0.81, which indicates that the translated questionnaire had a very good internal consistency. The same procedure was followed for the SFQ questionnaire. Cronbach's alpha (α) coefficient for the total SFQ was 0.92 after the completion of the questionnaires which proves high reliability of internal consistency.

ANALYSIS

Mean values, standard deviations (SD), median and interquartile ranges were used to describe the quantitative variables. Absolute (N) and relative (%) frequencies were used to describe the qualitative variables. Pearson's χ^2 test or Fisher's exact test was used to comparing ratios, where the latter was necessary. To check the type I error, due to the multiple comparisons, the Bonferroni correction was used, according to which the significance level is $0.05 / k$ (where k = the number of comparisons). Linear regression analysis was used to find independent factors related to the fear scale and the stress scale from which dependence coefficients (b) and their standard errors (standard errors = SE) emerged. The linear regression analysis for the fear scale was performed using logarithmic transformations, due to the irregularity of its distribution. So instead of using the initial values of the scale, their decimal logarithms were calculated and used as a dependent variable. Significance levels were bilateral and the statistical significance was set at 0.05. The statistical program SPSS 22.0 was used for data analysis.

RESULTS

[Table 1](#) revealed that the mean age of the studied group subjects was (68.0)8.1 and (65.7)10.2) respectively. The control group consisted of 30 male and 14 female patients, while the intervention group had 31 male and 13 female participants. The majority of the study and control groups were married and pensioners. No statistically significant differences were found between intervention and control groups regarding sociodemographic characteristics.

Table 1. Demographics of the sample

		Control group		Intervention group		
		N	%	N	%	
gender	Male	30	68.2	31	70.5	0.817†
	Female	14	31.8	13	29.5	
Age mean (SD)		68.0 (8.1)		65.7 (10.2)		0.245+
Marital status	Unmarried	0	0.0	1	2.3	0.118††
	Married	27	61.4	35	79.5	
	Divorced	6	13.6	3	6.8	
	Widower- Widow	11	25.0	5	11.4	
Profession	Civil servant	0	0.0	0	0.0	0.709††
	Private employee	3	6.8	6	13.6	
	Freelancer	3	6.8	5	11.4	
	Pensioner	31	70.5	26	59.1	
	Household	3	6.8	4	9.1	
	Unemployed	3	6.8	2	4.5	
	Military officer	0	0.0	1	2.3	
	Farmer	1	2.3	0	0.0	
Educational level	Primary school	16	36.4	14	31.8	0.666††
	Secondary school	9	20.5	12	27.3	
	High school	9	20.5	7	15.9	
	College	5	11.4	4	9.1	
	University	3	6.8	7	15.9	
	Master degree	1	2.3	0	0.0	
	PhD	1	2.3	0	0.0	
BMI	Normal	11	25.0	12	27.3	0.509†
	Overweight	16	36.4	18	40.9	
	Obese	17	38.6	14	31.8	
	Obese	17	38.6	14	31.8	
Smoking	No	29	65.9	26	59.1	0.509†
	Yes	15	34.1	18	40.9	
Alcohol		37	84.1	39	88.6	0.534†
		7	15.9	5	11.4	
BMI. Mean (SD)		28.7 (4.8)		28.0 (4.5)		0.435+

†Student's t-test ‡Pearson's χ^2 test ††Fisher's exact test

SELF-ASSESSMENT OF STRESS

The self-assessment of patients' stress on a 100-point scale for each group is presented in [Table 2](#) below.

The anxiety of the patients in the intervention group (those who received the information before the cardiac catheterization procedure) was significantly lower in all measurements compared to the anxiety of the patients in the control group.

[Table 3](#) demonstrates the participants' scores on the fear dimensions as to patients who will undergo invasive cardiac catheterization. The results presented in the table show that higher values indicate more fear.

The patients in the intervention group (those who had received the information about invasive cardiac catheterization) had significantly less short-term fear, but also over-

all compared to the patients in the control group. In contrast, long-term fear was similar in both groups.

[Table 4](#) presents participants' scores on the temporary and permanent stress scales, separately for each group. Higher values indicate more symptoms of anxiety.

Regularity was checked in the subgroups according to the Kolmogorov - Smirnov criterion.

Both groups appear to have similar anxiety symptoms. The cognitive characteristics of the patients for the 2 groups separately are given in [Table 5](#) below.

36.4% of the patients in the control group knew about the procedure of invasive cardiac catheterization. The corresponding percentage of patients in the intervention group was significantly higher and equal to 79.5%. Also, 6.8% of the patients in the control group had received some printed information material from the laboratory staff about the

Table 2. Self-assessment of stress

Stress	Group				P Mann-Whitney test
	Control		Intervention		
	mean (SD)	Median (Intermediate range)	mean (SD)	Median (Intermediate range)	
On admission to the coronary angiography laboratory	53.9 (27.5)	60 (30—70)	34.5 (23.5)	30 (20—50)	0.001
Before coronary angiography	52.5 (29)	60 (25—80)	33.9 (23.5)	30 (20—50)	0.002
During coronary angiography	49.5 (27.5)	55 (30—70)	34.8 (25.3)	30 (20—50)	0.011
After coronary angiography	18 (20.6)	10 (0—25)	9.8 (14.1)	10 (0—10)	0.020

Table 3. The patients' fear of the 2 groups separately

	Group				P Mann- Whitney test
	Control		Intervention		
	mean (SD)	Median (Intermediate range)	mean (SD)	Median (Intermediate range)	
Fear of surgery (short term)	21.5 (11.1)	23.5 (14—29)	14.3 (10.1)	14 (5—20)	0.002
Fear of surgery (long term)	17.3 (11.8)	17.5 (8.5—27)	13.5 (13.5)	11 (2.5—18.5)	0.062
Fear of surgery (total)	38.7 (19.8)	41 (20.5—54.5)	27.8 (21.7)	24 (12—37)	0.009

Table 4. Patients' scores on the temporary and permanent stress scales

	Group		P Student's t-test
	Control	Intervention	
	mean (SD)	mean (SD)	
Temporary stress	47.3 (13.2)	44.9 (11.2)	0.360
Permanent stress	39.3 (11.8)	40.5 (12.2)	0.627

procedure of invasive cardiac catheterization while the corresponding percentage of patients in the intervention group was significantly higher and equal to 27.3%. Also, 31.8% of the patients in the control group were informed about the possible complications of the procedure while the corresponding percentage of patients in the intervention group was significantly higher and equal to 56.8%. The other elements of [Table 5](#) above did not differ significantly between the two groups.

[Table 6](#) shows in detail the answers of the patients of each group to the questions concerning their satisfaction with the information they received. It also presents the rating of the participant's satisfaction with the provided information on the scale of 0 to 16 points. Higher scores correspond to greater satisfaction with the information provided.

The majority of patients in both groups would like to have all the necessary information available to them. They would also like to participate in the decision about their illness, with the percentages being 84.1% for the control group and 72.7% for the intervention group. In addition, 95.5% of patients in the control group and 88.6% of patients in the intervention group believed that the provision of in-

formation could be improved. The mean patient satisfaction score of the control group was 10.9 points (SD = 2.5 points) while for the intervention group patients was similar and equal to 11.1 points (SD = 2.3 points). Therefore, patients' satisfaction with the information provided was similar in the two groups.

DISCUSSION

Our findings demonstrate that patients in the intervention group had significantly less short-term and overall fear compared to the patients in the control group. Therefore, they are in agreement with previous findings of relevant studies which reported also that the intervention group had lower fear compared to the control group, indicating that education reduces psychological problems such as fear and anxiety³ and that patients who had received the necessary training before cardiac catheterization showed significantly fewer psychological problems.^{4,5} The reduction of psychological problems such as fear was a result of the use of educational programs was also the key result of a research con-

Table 5. The cognitive characteristics of the patients for the 2 groups separately (before cardiac catheterization)

		Group		P Pearson's χ^2 test
		Control	Intervention	
		N (%)	N (%)	
Do you know the procedure of invasive cardiac catheterization? (coronary angiography)	Yes	16 (36.4)	35 (79.5)	<0.001
	No	28 (63.6)	9 (20.5)	
Have you received any information from the laboratory staff about the invasive cardiac catheterization procedure?	Yes	13 (29.5)	20 (45.5)	0.123
	No	31 (70.5)	24 (54.5)	
Have you received any printed information material from the laboratory staff about the invasive cardiac catheterization procedure?	Yes	3 (6.8)	12 (27.3)	0.011
	No	41 (93.2)	32 (72.7)	
Have you been informed about the possible complications of the procedure?	Yes	14 (31.8)	25 (56.8)	0.018
	No	30 (68.2)	19 (43.2)	
Have you sought information about the process to be submitted?	Yes	16 (36.4)	23 (52.3)	0.133
	No	28 (63.6)	21 (47.7)	
Do you know from the past the cardiologist who will take care of you?	Yes	29 (65.9)	24 (54.5)	0.276
	No	15 (34.1)	20 (45.5)	

ducted by the Jamshidi and colleagues.⁶ Furthermore, the results of this study are also consistent with the research of Dehghani and colleagues who have shown that training programs in patients undergoing invasive cardiac catheterization play an important role in reducing fear and anxiety.⁵

In our research, the anxiety of the patients in the intervention group was significantly lower compared to the one that patients of the control group experience. Our finding is in agreement with the results presented by Dogan and colleagues which indicated that the use of patient-centered educational interventions can reduce their stress.⁷ Regarding the level of information provided to patients who undergo such evasive screening procedures, research conducted by Buzatto and Zanei and Aboalizm and colleagues., showed, in accordance with this study's results, that inadequate information and lack of education of patients about cardiac catheterization increase their stress levels.^{8,9} Finally, in another study by Garvin and colleagues, where 2 groups of patients were used, one intervention group and one control group, the intervention group (the informed group) recorded lower stress rates compared to the control group throughout the coronary angiography.¹⁰

CONCLUSIONS

Informing patients before coronary angiography plays an important role in reducing their anxiety and fear symptoms. Patients' gender is important in the manifestation of their anxiety and fear. The role of nurses in the education of patients is considered necessary and of great importance.

SUGGESTIONS

Additional suggestions for further research are:

- Specially trained nurses must collect and list all the necessary information that patients need
- Conducting research that will examine the relationship between the patient's adaptation to the hospital environment and previous education they received on health issues.
- The creation of an approved brochure regarding coronary angiography.
- The use of posters or instructional videos.
- Appropriate information for patients' relatives.

STUDY RESTRICTIONS

- Limited time frames as defined by the respective work time frames.
- The results may not generalize to all those undergoing invasive cardiac catheterization as the number of patients was small.
- It is necessary to conduct generalized surveys with more participants admitted to public and private hospitals.
- It is necessary to consider additional factors that may aggravate the feelings of fear and anxiety of patients who are waiting for an upcoming coronary angiography (waiting time, existence, or not of a supportive environment).

Table 6. Patients' satisfaction with their information

		Group				P Fisher's exact test
		Control		Intervention		
		N	%	N	%	
Which of the following categories best applies to you?	I would like all the available information and participate in the decision about my illness	37	84.1	32	72.7	0.359
	I would just like positive information about my illness	3	6.8	7	15.9	
	I would only like limited information and I would prefer the doctor to make the decisions	4	9.1	5	11.4	
Do you think that the provision of information could be improved?	No	2	4.5	5	11.4	0.434
	Yes	42	95.5	39	88.6	
Explanation regarding Invasive Cardiac Catheterization e.g. procedure, necessity of examination, possible risk	Very dissatisfied	0	0.0	1	2.3	0.779
	Dissatisfied	2	4.5	1	2.3	
	Neither	14	31.8	14	31.8	
	Satisfied	22	50.0	19	43.2	
	Very satisfied	6	13.6	9	20.5	
Information on side effects	Very dissatisfied	0	0.0	1	2.3	0.419
	Dissatisfied	1	2.3	0	0.0	
	Neither	19	43.2	13	29.5	
	Satisfied	21	47.7	25	56.8	
	Very satisfied	3	6.8	5	11.4	
Advises in relation to way of life after Invasive Cardiac Catheterization e.g. diet, exercise, health monitoring plans	Very dissatisfied	0	0.0	0	0.0	0.748
	Dissatisfied	0	0.0	1	2.3	
	Neither	16	36.4	14	31.8	
	Satisfied	19	43.2	22	50.0	
	Very satisfied	9	20.5	7	15.9	
Total information provided	Very dissatisfied	0	0.0	0	0.0	0.470
	Dissatisfied	3	6.8	0	0.0	
	Neither	13	29.5	15	34.1	
	Satisfied	21	47.7	22	50.0	
	Very satisfied	7	15.9	7	15.9	
Information Satisfaction Score. Average (SD) Median (Intermediate Range)		10.9 (2.5)	11 (9 - 12.5)	11.1 (2.3)	11 (9.5 -12)	0.742+

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AUTHOR CONTRIBUTION

MM had the supervision of the whole study
 VP and IA made the research protocol
 VP and IP wrote the manuscript
 AN and IA made the analysis of the data collection
 MM and PS reviewed the manuscript

CONFLICT OF INTEREST STATEMENT

There is no conflict of Interest

FUNDING

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