Original Article

Effects of Interventions Based on Patient Expectations on Coronary Surgery Outcomes: A Randomized Clinical Trial

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Abstract

Background: *Coronary surgery can have various outcomes, such as fear of death, cardiac anxiety, and pain disability. This study aimed to evaluate the effects of interventions based on patient expectations on different outcomes of coronary surgery, including expectations, cardiac anxiety, and pain-induced disability.*

Methods: *This randomized clinical trial evaluated 60 coronary surgery candidates. Patients meeting the inclusion criteria were randomly assigned to control and intervention groups. The patients were contacted 1 to 2 weeks before coronary surgery to complete the Cardiac Surgery Patient Expectations Questionnaire (C-SPEQ). Based on the analysis of expectations, the intervention group underwent interventions to optimize expectations, whereas the control group received only routine care. The Cardiac Anxiety Questionnaire (CAQ) and the Pain Disability Index (PDI) were completed on the day of hospitalization. Three months later, the participants recompleted all 3 questionnaires. The data were analyzed with descriptive and analytical statistics in SPSS 16.0.*

Results: *There were no significant differences between the control and intervention groups in baseline variables, pain-induced disability (P=0.353), and cardiac anxiety (P=0.479). After the intervention, no significant differences were observed between the groups concerning expectations (P=0.554) and pain-induced disability (P=0.557) when the confounding variables were adjusted. Nevertheless, cardiac anxiety decreased significantly (P=0.027).*

Conclusion: *Our interventions improved expectations and mitigated anxiety among coronary surgery patients. Actualization and optimization of patient expectations should be considered in the care of coronary surgery candidates.*

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Introduction

Cardiovascular diseases are known as the most prevalent diseases in many countries.[1] In Iran, these diseases are considered the first known condition causing disability and death.[2] Cardiovascular surgery is essential in many cases. Recent advances in necessary equipment and technology have increased the feasibility and safety of this kind of surgery.[1,3]

Cardiovascular surgery improves outcomes, quality of life, and survivability, even in elderly and high-risk patients. However, there are also some outcomes affected by surgery and psychiatric complications of patients.[4] For instance, cardiovascular surgery candidates repeatedly experience depression, anxiety, post-traumatic stress disorder, delirium, cognitive traumas,[5,6] and postoperative disability.[7,8] Pain[9] and pain disabilities are among the complications caused by cardiovascular surgery following a sternotomy. Sometimes, cardiovascular surgery causes persistent pain in the thoracic cage for no clear reason.[10] Postoperative pain emerges in 37% of patients within the first 6 months after surgery; nonetheless, it can also persist in 17% of patients for 2 years. The thoracic cage is the center of pain, whereas the feet are the focal point of neuropathic pain.[9]

This pain adversely affects a person's ability concerning family and home responsibilities, recreational and social activities, occupational duties, sexual behavior, self-care, and life support activities.[11] Emerging both before and after surgery, cardiac anxiety is another complaint raised by patients with cardiovascular diseases. This anxiety can be caused by pain in the thoracic cage, and it can resemble cardiac pains. Cardiac anxiety and fear of death are correlated with numerous physical and psychological disorders and should be considered when implementing interventions for patients with high levels of anxiety to help them adapt to surgery and long-term cardiac complications.[12]

Patient expectation is a factor that could affect outcomes and complications. An expectation denotes what a patient would like to happen and is focused on a probabilistic estimation of the future: it is beyond an expression of hopes or desires.[13] Vital to physical and psychological health, expectations affect treatment outcomes, emotional functions, social support,[14] pain,[15] and return to work.[16] According to the results of a study, expectations can predict mortality, even 15 years after cardiovascular diseases.[17] Patients undergoing cardiovascular surgery have specific expectations of the procedure. If their expectations are not fulfilled after surgery, they will experience anger, disappointment, and depression, which can affect the surgical outcomes.[18] In a study on patient expectations after cardiac surgery, patients stated that their preoperative expectations were not met; as a result, they experienced low quality of life, physical problems, psychological complications, depression, and disappointment.[7] According to the results of that study regarding recovery expectation and long-term prognosis of patients with coronary disease, those who had more favorable expectations of possible recovery and return to normal lifestyle could experience better survivability and better functions after hospital discharge.[17]

Patient expectations merit attention on account of their role in predicting postoperative outcomes.[19] Specific interventions should also be implemented to solve this problem. These interventions should actualize and optimize expectations[18,20] so as to mitigate the negative outcomes of surgery.[7] Furthermore, patients enter the treatment cycle with preconceived expectations ensuing from past experiences through learning and conditions, society (eg, media and peers), and personal differences (ie, biological and genetic).[21] Generally, expectations can be considered the basis of predictions regarding specific conditions. Negative expectations about surgery and anticipating a lengthy hospital stay for recovery can lead to delayed treatment and worsened health outcomes. This predictable expectation or reaction can be a physiological reaction, such as anxiety or even higher levels of blood pressure, which can affect the emergence of potential complications. Therefore, monitoring patients' information processing can help address their unrealistic expectations.[21] According to the results of studies on improving patient expectations before cardiac surgery, this intervention can improve surgical outcomes.[20,22] Nevertheless, the literature offers only a few studies in this field.

Known as the largest group of caregivers in hospitals, nurses should be aware of patient expectations, for patient perception of nursing care includes sharing information on patient conditions, along with kindness and compassion.[23] Cases of coronary surgery are on the rise; hence, exclusive studies should be conducted to improve the outcomes of patients. Accordingly, the present study aimed to analyze the effects of interventions based on patient expectations of coronary surgery outcomes.

Methods

The research span of this randomized clinical trial was from November 22, 2021, through June 2022. This study was conducted at the Department of Cardiac Surgery at Golestan Hospital in Ahvaz, Khuzestan Province. Known as a major referral center in Ahvaz, this general hospital has 766 beds, 25 of which belong to the Department of Cardiac Surgery. On average, 40 cardiac surgeries are performed at this hospital every month. The research sample consisted of 60 coronary surgery candidates. The inclusion criteria were age above 18 years, undergoing coronary surgery for the

first time, having a good command of the Persian language, having no emergency conditions, and giving consent for study participation. The exclusion criteria were having a psychological disorder, having a serious underlying condition leading to further disability, and being an employee in the healthcare system or a family member of employees. These criteria were controlled through interviews with patients, opinions of cardiovascular surgeons, and reviews of patient files. Participants were to be excluded if they died during or after surgery or experienced complications in other organs, such as the brain or kidneys.

First, the researcher (KNL) acquired a list of coronary surgery candidates and their phone numbers. The patients were contacted within 1 to 2 weeks before surgery, and the researcher completed patient expectation questionnaires by conducting telephone interviews.

The patient expectation questionnaire was analyzed to determine the necessary aspects of the intervention (based on expectations and optimization of expectations). The researcher coordinated and consulted with a cardiovascular surgeon and a psychiatric nurse to conduct the intervention. After the necessary aspects of the intervention were identified, 2 sessions were held to inform the coronary heart surgery candidates, with the sessions entitled "Improving Expectations of Outcomes" and "Providing Personal Control." Due to the COVID-19 pandemic, the sessions were held on WhatsApp individually. Each session lasted 70 to 90 minutes at 4- to 6-day intervals. In this step, the researcher provided concise and easy-to-understand information, used illustrations to help explain complex information, encouraged the patients to ask questions, and provided opportunities for them to ask questions. Further, the authors provided written information in 2 pages for each session and sent it to the patients via WhatsApp.

The intervention aimed to improve outcome expectations and provide personal control. Regarding the intervention based on expectations of outcomes, the researcher presented some information on surgery and its potential benefits to the patients. No educational purposes were intended, nor was the information meant to paint a rosy picture: only necessary information was shared. In a nutshell, the aim was to instill realistic expectations of the treatment. Afterward, each patient was asked to write or express their expectations of the treatment and postoperative activity plans. For instance, they were asked what positive activities they could enjoy during recovery. They were also requested to visualize such activities. To exert positive effects on expectations of personal control, the researcher informed the patients regarding the potential postoperative symptoms. The participants were told how to adjust their health behaviors to facilitate recovery. On average, 6 phone or WhatsApp calls were made every 2 weeks after a patient's discharge to offer consultations and reminders about the contents of specific interventions. These calls lasted between 10 and 25 minutes. In the calls, the researcher enquired about the patient's condition and expectations and provided a brief overview of the patient's condition. In addition, if necessary, a cardiovascular surgeon was consulted, and feedback was provided to the patient. During these calls, all interventions designed for each patient were repeated and retold. For instance, a patient had a fruit shop and expected to return to work 2 weeks after surgery. In the intervention, this patient was told that he would need at least 1 month after surgery for sternum bone recovery. He was instructed to start by taking short walks before gradually walking long distances and then walking up stairs for nearly 1 month after discharge. Subsequently, the patient could return to his fruit shop if there were no complications in his daily routines. Still, he was advised against lifting heavy objects and fruit crates. The patient was encouraged to be only a spectator at his shop until he could start taking further actions gradually. According to our plan, within 3 months, he was allowed to move lightweight crates provided that there were no complications.

The control group received only routine care, including information provided by nurses and physicians on the condition, necessary care, and relevant pamphlets. Routine care was also provided for the intervention group. Table 1 presents a summary of the intervention phases.

The primary outcomes were patient expectations and cardiac anxiety, and the pain disability was the secondary outcome. They were measured through the Cardiac Surgery Patient Expectations Questionnaire (C-SPEQ), the Cardiac Anxiety Questionnaire (CAQ), and the Pain Disability Index (PDI), respectively.

The data collected on postoperative patient expectations indicated how the recovery process progressed.

The demographic clinical questionnaire included different items regarding age, sex, marital status, educational attainment, occupation, smoking and substance abuse, history of heart attacks, the number of coronaries involved, ejection fraction, and body mass index.

The C-SPEQ, presented by Holmes et al[7] (2016), is a 20-item tool employed exclusively to analyze cardiac surgery patient expectations. The items are responded to on a scale ranging from "strongly agree" to "strongly disagree." There are 8 inverted items in this questionnaire. After the inverted codes are applied, the scores of all 20 items are added. Higher scores indicate further negative expectations after cardiac surgery. To complete this questionnaire after surgery, we changed its verbs to the past tense forms. Items 2 and 9 were also deleted. The validity and reliability of this questionnaire were reported to be acceptable.[7,18] This questionnaire was completed twice by the participants before hospitalization and 3 months after discharge.

Cardiac anxiety was determined using CAQ, an 18-item questionnaire scored on a 5-point scale (ranging from 0 for "never" to 4 for "always"). The total score of

Table 1. Intervention Steps

Time	Actions Taken
Before Hospital Admission	
	Completing the patient expectation questionnaires through phone interviews
	Analyzing the patients' expectations to determine the necessary aspects of the intervention
	Determining necessary interventions based on the analysis of patient expectations and con-sultations with cardiovascular surgeons
	Holding 2 virtual sessions with each patient: a) Virtual Session I "Improving Expectations of Outcomes:" Giving the patients necessary information regarding the surgery and its potential benefits b) Virtual Session II "Providing Personal Control:" Informing the patients about possible postoperative symptoms. The patients were asked to express their expectations of the treatment and postoperative activity plan. They were also instructed on how to adjust their health behaviors to expedite recovery.
On Admission	
	Completing the pain disability and cardiac anxiety questionnaires
From Discharge to 3 Months After Surgery	
	Interacting with the patients, having question-and-answer sessions, and reminding them about specific interventions via phone or WhatsApp calls
Three Months Later	
	Completing the pain disability, cardiac anxiety, and expectation questionnaires

this questionnaire is obtained by adding the scores of all responses and dividing the result by 18. Higher scores indicate higher levels of cardiac anxiety. This questionnaire also consists of 3 sections: "heart-related fear," "avoidance," and "attention."[24] The Cronbach α of this questionnaire was reported to be 0.83, and the Cronbach α of reliability was reported to be acceptable in its different sections.[25] This questionnaire was completed once when the patients were hospitalized and once again 3 months after discharge.

Pain disability was measured using PDI, which analyzes disability caused by disease in 7 dimensions: family and home responsibilities, recreational activity, social activity, occupation, sexual behavior, self-care, and life support activity. Each dimension has 1 item scored on a visual analog scale ranging from 0 for "inability" to 10 for "maximum disability." The total score is determined by adding the scores of all items and dividing the result by 7. It ranges between 0 and 70, with higher scores indicating higher levels of daily disability caused by pain.[11] The validity and reliability of this tool were analyzed in Iran. This questionnaire was completed once when the patients were hospitalized and once again 3 months after discharge.

All 3 questionnaires were translated through the forward and backward translation process and were distributed among cardiology professors and nursing faculty members to determine their validity. After its face validity and content validity were confirmed, its reliability was evaluated. The Cronbach α was used for reliability, which was reported to be 0.8, 0.75, and 0.78 for C-SPEQ, CAQ, and PDI, respectively.

The effect size method was employed to determine the sample size. Based on an effect size of 0.80, we assigned 26 participants to each group. Given the attrition rate, the number of participants increased to 30 in each group. Moreover, the type I error and power were assumed to be 0.05 and 90%, respectively.

The convenience sampling method was adopted to include eligible patients before assignment to control and intervention groups through permuted block randomization.

In this study, only the statistician was unaware of the allocation of participants to the control and intervention groups.

Quantitative (continuous) and qualitative (categorical) variables were described as means (standard deviations) and frequencies (percentages), respectively. The Mann-Whitney U and Wilcoxon tests were applied to compare the quantitative variables between and within the groups, respectively. Additionally, the association between the 2 groups with demographic qualitative characteristics was analyzed using the χ^2 test. Finally, to compare the effect of the intervention on outcomes (expectations, pain disability, and cardiac anxiety scores) with adjustments for confounding factors and pre-intervention outcomes, we utilized a backward stepwise multiple linear regression model (with entry P=0.050 and removal P=0.100 criteria). All statistical analyses were performed using SPSS, version 16.0, and a P value of 0.05 was considered statistically significant.

This study was approved by the Research Ethics Committee of the Schools of Nursing and Midwifery and Rehabilitation, Tehran University of Medical Sciences (IR.TUMS.FNM.REC.1399.217) on February 20, 2021. The research purposes were explained to the participants, who gave oral and written consent. Moreover, codes were used instead of names in the questionnaires. This study was registered at the Iranian Registry of Clinical Trials on July 5, 2021 (IRCTID: IRCT20210303050566N1).

Results

In this study, 88 patients were analyzed from November 22, 2021, through June 2022. However, 28 patients were excluded because they did not meet the inclusion criteria. Finally, 60 participants were assigned equally to control and intervention groups (n=30) (Figure 1).

According to Table 2, although the mean (61.19±9.282 y) and median (61 y) of age were higher in the control group than the mean (58.60±8.348 y) and median (60 y) of age in the intervention group, there were no significant differences concerning the mean of age (P=0.3). Still, there was a borderline significant difference between the groups vis-à-vis educational attainment (P=0.05). In other words, there were more illiterate participants in the intervention group (53.3%) than in the control group (38.5%). Moreover, there were more participants with high school diplomas and higher degrees in the intervention group (26.7%) than in the control group (11.5%). The ejection fraction in the intervention group (mean±SD/median=41.5±10.09/45) was lower than that in the control group (mean±SD/median=43.07±8.49/45), but there was no statistically significant difference in this regard (P=0.584).

Prior to the intervention, the mean score of patient expectation was higher in the control group than in the intervention group (P=0.048); however, there were no significant differences between the groups after the intervention (P=0.225). In the intervention group, the mean patient expectation score rose significantly (P=0.025), whereas it did not rise significantly in the control group (P=0.264). No significant differences existed between the groups regarding the total cardiac anxiety score before (P=0.479) and after (P=0.112) the intervention. Moreover, the total cardiac anxiety score decreased significantly in the intervention group (P<0.001) and the control group (P<0.001) after the intervention. The results showed no significant differences between the 2 groups in terms of pain disability before (P=0.353) and after (P=0.882) the intervention. Nevertheless, the mean pain disability score dropped significantly in the intervention group (P<0.001) and the control group (P<0.001) (Table 3). The mean and standard deviation of the outcomes are shown in Table 3.

After the effects of confounding variables and the scores of expectations before the intervention were adjusted and deleted, the mean scores of expectations following the intervention did not indicate any significant differences in both groups (P=0.554). Moreover, after the elimination of the effects of confounding variables, only ejection fraction had an inverse effect on the mean scores of patient expectations following the intervention (P=0.03). As the mean ejection fraction increased by 1 unit, the mean patient expectation score decreased to 0.104 following the intervention (Table 4).

After the effects of confounding variables and the scores of cardiac anxiety before the intervention were adjusted and deleted, there was a significant difference between the 2 groups in the mean scores of cardiac anxiety following the intervention (P=0.027). After the elimination of the effects of confounding variables, only ejection fraction significantly affected the mean cardiac anxiety score following the intervention (P=0.001). As the mean ejection fraction increased by 1 unit, the mean cardiac anxiety score fell to 0.014 following the intervention (Table 4).

After the adjustment and deletion of the effects of confounding variables and the scores of pain disability before the intervention, the mean pain disability score following

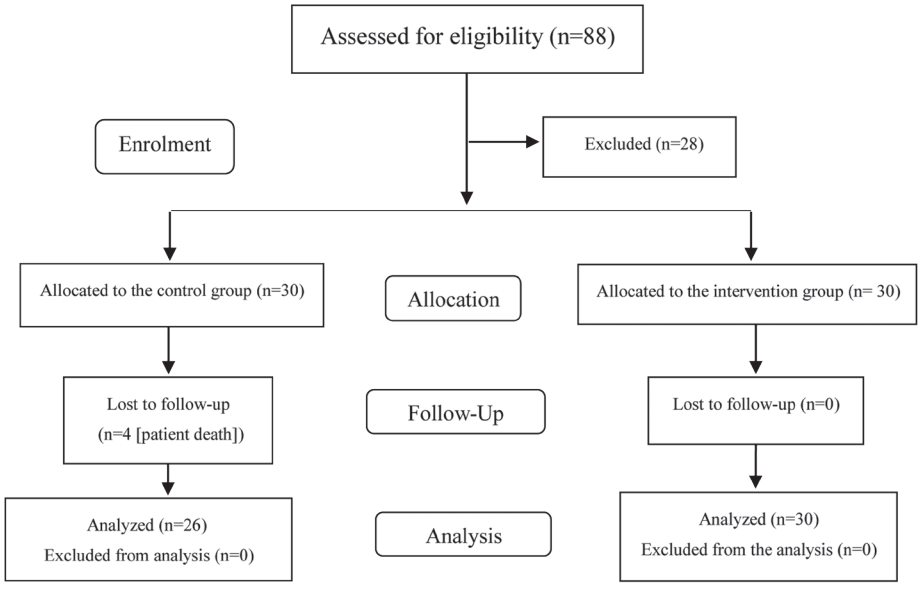

Figure 1. The image presents the study's flow diagram.

Table 2. Baseline Demographics and Clinical Characteristics of the Participants*

Variable	Intervention (n=30) mean±SD/median	Control (n=26) mean±SD/median	P
Age	58.60±8.34/60	61.19±9.28/61	0.300
Sex			0.191
Male	26 (86.7)	18 (69.2)	
Female	4 (13.3)	8 (30.8)	
Marital Status			0.401
Married	28 (93.3)	22 (84.6)	
Death of spouse or divorce	2 (6.7)	4 (15.4)	
Educational Attainment			0.050
Illiterate	16 (53.3)	10 (38.5)	
Below diploma	6 (20.0)	13 (50.0)	
Diploma and higher	8 (26.7)	3 (11.5)	
Occupation			0.154
Unemployed	4 (13.3)	9 (34.6)	
Employee/worker/freelance	15 (50.0)	11 (42.3)	
Retired	11 (36.7)	6 (23.1)	
Smoking			0.037
Yes	14 (46.7)	4 (15.4)	
No	13 (43.3)	16 (61.5)	
Smoking cessation	3 (10.0)	6 (23.1)	
Substance Abuse			0.197
Yes	5 (16.7)	3 (11.5)	
No	22 (73.3)	23 (88.5)	
Addiction cessation	3 (10.0)	0	
History of Heart Attacks			0.601
Yes	15 (50.0)	11 (42.3)	
No	15 (50.0)	15 (57.7)	
Number of Coronaries Involved			0.655
3	28 (93.3)	23 (88.5)	
3	2 (6.7)	3 (11.5)	
Body mass index	26.82±3.48/26.73	27.43±3.99/26.07	0.699
Ejection fraction	41.5±10.09/45	43.07±8.49/45	0.584

*Data are presented as mean±SD /median or n (%).

Table 3. Comparisons between the Control and Intervention Groups Concerning the Primary and Secondary Outcomes*

	Intervention (n=30) mean±SD/median	Control (n=26) mean±SD/median	P**
Primary Outcome			
Expectation			
Before	52.13±4.62/52	54.26±2.76/54	0.048
After	53.96±4.22/54	55.07±2.65/55.5	0.225
P***	0.025	0.264	
Cardiac Anxiety			
Total			
Before	1.55±0.82/1.93	1.49±0.96/1.50	0.479
After	0.82±0.35/0.68	0.96±0.30/0.93	0.112
P***	<0.001	<0.001	
Fear			
Before	1.82±0.73/1.93	1.54±0.69/1.50	0.093
After	0.75±0.57/0.68	0.91±0.49/0.93	0.277
P***	<0.001	<0.001	
Avoidance			
Before	1.98±0.73/2	2.09±0.56/2	0.821
After	1.40±0.57/1.4	1.63±0.38/1.6	0.056
P***	<0.001	<0.001	
Attention			
Before	0.70±0.61/0.60	0.82±0.60/0.80	0.402
After	0.34±0.38/0.20	0.36±0.22/0.40	0.201
P***	0.008	0.001	
Secondary Outcome			
Pain Disability			
Before	18.55±14.25/21	15.28±11.56/14.5	0.353
After	5.90±7.06/3.5	5.76±5.77/3	0.882
P***	<0.001	<0.001	

*Data are presented as mean±SD/median or n (%).
**The Man-Whitney U test
***The Wilcoxon test

Table 4. Results of the Multiple Linear Regression Analysis of Factors Associated With Post-Outcome Variables

	Coefficient	Std. Error	95% CI	P
Dependent Variable: Expectation (After)				
Expectation (before)	0.348	0.112	0.122 to 0.573	0.003
Ejection fraction	-0.104	0.046	-0.197 to -0.011	0.030
Group (control vs. intervention)	-0.531	0.891	-2.320 to 1.257	0.554
Dependent Variable: Cardiac Anxiety (After)				
Cardiac anxiety (before)	0.239	0.077	0.085 to 0.392	0.003
Ejection fraction	-0.014	0.004	-0.022 to -0.006	0.001
Group	-0.175	0.077	-0.330 to -0.021	0.027
Dependent Variable: Pain disability (After)				
Pain disability before	0.403	0.044	0.314 to 0.492	<0.001
Education (literate)	-3.601	1.277	-6.164 to -1.037	0.007
Group	-0.691	1.170	-3.041 to 1.658	0.557

the intervention did not indicate any significant differences in both groups (P=0.557). Furthermore, after the effects of confounding variables were eliminated, education (illiterate vs literate) significantly affected the pain disability score following the intervention (Table 4). This finding means that the pain disability score decreased to 3.601 in the literate patients compared with their illiterate counterparts.

Discussion

Our intervention for patient expectations failed to enhance patient expectations and pain disability, but it alleviated cardiac anxiety significantly.

Following the intervention, we found no significant differences between the control and intervention groups in the mean expectation score. Although the patient expectation score improved meaningfully in the intervention group and became more realistic, the improvement was not significant in comparison with the control group. A study was conducted in Germany (2013) to optimize patient preoperative expectations by applying a brief psychoeducational program to the outcomes of coronary artery bypass graft surgery, and the results revealed that the intervention group had higher personal control and more realistic expectations of the treatment period. Further, actualization of expectations and implementation of an intervention based on patient expectations improved expectations, inconsistent with the results of the present study.[20] This inconsistency can be due to cultural differences and types of expectations in developed countries compared with developing countries. The controversial point in this regard is that previous studies failed to furnish detailed explanations concerning the type, method, and conduct of the interventions, rendering it difficult to explain and interpret the differences in the results.

We detected a significant difference between the 2 groups in the mean cardiac anxiety score after adjusting confounding variables before the intervention. In fact, the cardiac anxiety score was lower in the intervention group. According to a study that analyzed the effects of preoperative optimism on anxiety in patients 1 month after open-heart surgery, higher levels of preoperative optimism led to lower levels of postoperative anxiety.[26] An investigation (2021) into the effects of preoperative training and ICU tours on satisfaction and anxiety among patients and families in the ICU after coronary surgery reported a weak correlation between preoperative training and lower anxiety levels during treatment.[27] Hence, interventions based on patient expectations beyond patient education helped alleviate cardiac anxiety. The results also indicated that the mean cardiac anxiety score within each of the 2 groups manifested significant differences before and after the intervention. We can, therefore, conclude that coronary surgery, confidence in its effectiveness, and better postoperative condition assuaged cardiac anxiety in both groups. Nonetheless, optimizing patient expectations can significantly impact cardiac anxiety.

Our proposed intervention did not cause any significant differences between the control and intervention groups concerning pain disability. According to a study that aimed to optimize preoperative patient expectations to improve the outcomes of coronary artery bypass graft surgery, patients who received a brief psychological intervention had less pain disability after expectation improvement (EXPECT) than the standard care group.[22] In another study, a brief psychological expectancy intervention (positive verbal suggestion combined with sham acupuncture) was administered to breast cancer surgery candidates to optimize patient expectations for treatment. According to the results, the mean pain score during a 24-hour period after the surgery decreased significantly among the patients who received the positive treatment suggestions. Additionally, the pain disability scores fell in both groups, suggesting that the recovery process alleviated pain in patients undergoing heart surgery.[28] In contrast, the intervention in the present study failed to affect pain disability.

Based on the results of the current study, it is essential to consider patient expectations and create realistically positive expectations. Future studies can consider other outcomes of surgery, such as satisfaction with treatment and surgery, quality of life, and ability to perform daily tasks. We found that cardiac anxiety and pain disability decreased in both groups over time after coronary surgery. Therefore, patients

should be reminded that pain disability and cardiac anxiety will decrease as time passes after coronary surgery.

The current study was conducted during the COVID-19 pandemic; consequently, the intervention was implemented online. In-person implementation of this intervention may have provided different results. Additionally, our small sample size, large effect size, and online sessions may have influenced the effectiveness of the proposed intervention. Another salient limitation is that we analyzed the outcomes of coronary surgery in a 3-month period (a short term) and not in long-term periods lasting between 6 months and 1 year.

This study was conducted only in patients undergoing coronary surgery. Future studies are expected to investigate patients who have undergone any type of heart surgery, such as heart valve surgery.

Conclusion

In light of the results of the present study, the intervention based on patient expectations failed to affect the expectations of the recruited patients and their pain disability. However, it alleviated their cardiac anxiety. Since our intervention based on patient expectations managed to mitigate cardiac anxiety in our study population, nurses, cardiologists, and psychiatrists can employ this intervention to alleviate cardiac anxiety in their patients. Health policymakers and cardiac surgery teams can consider the expectations of patients undergoing coronary surgery in their care policies. To that end, cardiac surgery teams can complete questionnaires regarding patient expectations before surgery and optimize expectations based on the results.

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References

1. Bhatnagar P, Wickramasinghe K, Williams J, Rayner M, Townsend N. The epidemiology of cardiovascular disease in the UK 2014. Heart 2015;101:1182-1189.
2. Sarrafzadegan N, Mohammmadifard N. Cardiovascular Disease in Iran in the Last 40 Years: Prevalence, Mortality, Morbidity, Challenges and Strategies for Cardiovascular Prevention. Arch Iran Med 2019;22:204-210.
3. Beckmann A, Funkat AK, Lewandowski J, Frie M, Ernst M, Hekmat K, Schiller W, Gummert JF, Welz A. German Heart Surgery Report 2015: The Annual Updated Registry of the German Society for Thoracic and Cardiovascular Surgery. Thorac Cardiovasc Surg 2016;64:462-474.
4. Lee R, Li S, Rankin JS, O'Brien SM, Gammie JS, Peterson ED, McCarthy PM, Edwards FH; Society of Thoracic Surgeons Adult Cardiac Surgical Database. Fifteen-year outcome trends for valve surgery in North America. Ann Thorac Surg 2011;91:677-684.
5. Tully PJ, Baumeister H, Bennetts JS, Rice GD, Baker RA. Depression screening after cardiac surgery: A six month longitudinal follow up for cardiac events, hospital readmissions, quality of life and mental health. Int J Cardiol 2016;206:44-50.
6. Curcio N, Philpot L, Bennett M, Felius J, Powers MB, Edgerton J, Warren AM. Anxiety, depression, and healthcare utilization 1 year after cardiac surgery. Am J Surg 2019;218:335-341.
7. Holmes SD, Fornaresio LM, Miller CE, Shuman DJ, Ad N. Development of the Cardiac Surgery Patient Expectations Questionnaire (C-SPEQ). Qual Life Res 2016;25:2077-2086.
8. Connerney I, Shapiro PA, McLaughlin JS, Bagiella E, Sloan RP. Relation between depression after coronary artery bypass surgery and 12-month outcome: a prospective study. Lancet 2001;358:1766-1771.
9. Guimarães-Pereira L, Reis P, Abelha F, Azevedo LF, Castro-Lopes JM. Persistent postoperative pain after cardiac surgery: a systematic review with meta-analysis regarding incidence and pain intensity. Pain 2017;158:1869-1885.
10. Bordoni B, Marelli F, Morabito B, Sacconi B, Severino P. Post-sternotomy pain syndrome following cardiac surgery: case report. J Pain Res 2017;10:1163-1169.
11. Tait RC, Pollard CA, Margolis RB, Duckro PN, Krause SJ. The Pain Disability Index: psychometric and validity data. Arch Phys Med Rehabil 1987;68:438-441.
12. Hoyer J, Eifert GH, Einsle F, Zimmermann K, Krauss S, Knaut M, Matschke K, Köllner V. Heart-focused anxiety before and after cardiac surgery. J Psychosom Res 2008;64:291-297.
13. Laferton JA, Kube T, Salzmann S, Auer CJ, Shedden-Mora MC. Patients' Expectations Regarding Medical Treatment: A Critical Review of Concepts and Their Assessment. Front Psychol 2017;8:233.
14. McRae C, Cherin E, Yamazaki TG, Diem G, Vo AH, Russell D, Ellgring JH, Fahn S, Greene P, Dillon S, Winfield H, Bjugstad KB, Freed CR. Effects of perceived treatment on quality of life and medical outcomes in a double-blind placebo surgery trial. Arch Gen Psychiatry 2004;61:412-420.
15. Sullivan M, Tanzer M, Reardon G, Amirault D, Dunbar M, Stanish W. The role of presurgical expectancies in predicting pain and function one year following total knee arthroplasty. Pain 2011;152:2287-2293.
16. Tolver MA, Strandfelt P, Forsberg G, Hjørne FP, Rosenberg J, Bisgaard T. Determinants of a short convalescence after laparoscopic transabdominal preperitoneal inguinal hernia repair. Surgery 2012;151:556-563.
17. Barefoot JC, Brummett BH, Williams RB, Siegler IC, Helms MJ, Boyle SH, Clapp-Channing NE, Mark DB. Recovery expectations and long-term prognosis of patients with coronary heart disease. Arch Intern Med 2011;171:929-935.
18. Chunta KS. Expectations, anxiety, depression, and physical health status as predictors of recovery in open-heart surgery patients. J Cardiovasc Nurs 2009;24:454-464.
19. Auer CJ, Glombiewski JA, Doering BK, Winkler A, Laferton JA, Broadbent E, Rief W. Patients' Expectations Predict Surgery Outcomes: A Meta-Analysis. Int J Behav Med 2016;23:49-62.
20. Laferton JA, Auer CJ, Shedden-Mora MC, Moosdorf R, Rief W. Optimizing preoperative expectations in cardiac surgery patients is moderated by level of disability: the successful development of a brief psychological intervention. Psychol Health Med 2016;21:272-285.
21. Doering BK, Glombiewski JA, Rief W. Expectation-Focused Psychotherapy to Improve Clinical Outcomes. Int Rev Neurobiol 2018;138:257-270.
22. Rief W, Shedden-Mora MC, Laferton JA, Auer C, Petrie KJ, Salzmann S, Schedlowski M, Moosdorf R. Preoperative

optimization of patient expectations improves long-term outcome in heart surgery patients: results of the randomized controlled PSY-HEART trial. BMC Med 2017;15:4.
23. Girmay A, Marye T, Haftu M, G/Her D, Brhanu T, Gerensea H. Patients expectation strongly associated with patients perception to nursing care: hospital based cross sectional study. BMC Res Notes 2018;11:310.
24. Eifert GH, Thompson RN, Zvolensky MJ, Edwards K, Frazer NL, Haddad JW, Davig J. The cardiac anxiety questionnaire: development and preliminary validity. Behav Res Ther 2000;38:1039-1053.
25. van Beek MH, Voshaar RC, van Deelen FM, van Balkom AJ, Pop G, Speckens AE. The cardiac anxiety questionnaire: cross-validation among cardiac inpatients. Int J Psychiatry Med 2012;43:349-364.
26. Ai AL, McMullen CA, Smyth SS. Preoperative Optimism Related to Low Anxiety in Patients 1 Month After Open Heart Surgery. J Nerv Ment Dis 2020;208:966-973.
27. Lai VKW, Ho KM, Wong WT, Leung P, Gomersall CD, Underwood MJ, Joynt GM, Lee A. Effect of preoperative education and ICU tour on patient and family satisfaction and anxiety in the intensive care unit after elective cardiac surgery: a randomised controlled trial. BMJ Qual Saf 2021;30:228-235.
28. Benson S, Hagen S, Hoffmann O, Pasler A, Bingel U, Schedlowski M, Peters J, Elsenbruch S, Frey UH. Can a brief psychological expectancy intervention improve postoperative pain? A randomized, controlled trial in patients with breast cancer. Pain 2019;160:1562-1571.