

DERLEME / Review

# Kardiyak Cerrahi Girişim Uygulanan Hastalarda Preoperatif Eğitimin İyileştirici Gücü

## *The Healing Power of Preoperative Education In Patients Undergoing Cardiac Surgery*

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### ÖZ

Ameliyat öncesi eğitim, ameliyat öncesi psikososyal destek sağlayarak hastaların deneyimlerini, baş etme becerilerini ve sağlık bakımı ile ilgili bilgilerini geliştirmek için kullanılmıştır. Ameliyat öncesi eğitimin, postoperatif komplikasyonları ve hastanede kalış süresini kısaltmada ve iyileşmeyi olumlu yönde etkilemede yararlı olduğu kanıtlanmıştır. Ayrıntılı preoperatif talimatlar ile iyi hazırlanmış hastalar ameliyatları ile daha etkin bir şekilde ilgilenirler ve ağrılarını yönetme ve uygun öz bakım faaliyetlerini yerine getirmede daha hazırlıklı olmaktadır. Ameliyat öncesi eğitim, postoperatif komplikasyonları en aza indirmek, hasta uyumunu arttırmak ve hasta anksiyetesini azaltmak için önemlidir. Birçok araştırma, ameliyat öncesi eğitim müdahalelerinin postoperatif sonuçları iyileştirmede başarılı olup olmadığını ve kardiyak cerrahi sonrası fiziksel ve psikolojik iyileşmeyi artırıp artırdığını araştırmıştır. Kalp cerrahisi sonrası preoperatif eğitimin önemini konusunda giderek artan bir ilgi vardır. Bu derlemenin amacı, ameliyat öncesi eğitimin, kalp cerrahisi geçiren hastalarda postoperatif sonuçlar üzerindeki etkisini değerlendirmektir.

**Anahtar Kelimeler:** Kardiyak Cerrahi; Hasta Eğitimi; Hemşirelik; Ameliyat Öncesi Dönem; İyileşme.

### ABSTRACT

Preoperative education has been used to improve patients' experiences by providing health care relevant information, coping skills, and psychosocial support before surgery. It has proven beneficial in decreasing postoperative complications and length of stay as well as positively influencing recovery. Patients who are well prepared with detailed preoperative instruction deal more effectively with their surgery and are better prepared to manage their pain and engage in appropriate self-care activities. It is important to minimize postoperative complications, increase patient compliance, and decrease patient anxiety. Many research studies have investigated whether preoperative education interventions were successful in improving postoperative outcomes and increasing physical and psychological recovery after cardiac surgery. There is a growing attention in knowing the significance of preoperative education after cardiac surgery. The objective of this review was to assess the effect of preoperative education on postoperative outcomes among patients undergoing cardiac surgery.

**Keywords:** Cardiac Surgical Procedures; Patient Education; Nursing; Preoperative Period; Recovery.

### INTRODUCTION

Cardiovascular diseases (CVDs) are the number one cause of death globally: more people die annually from CVDs than from any other cause. An estimated 17.7 million people died from CVDs every year, representing 31% of all global deaths. Over three quarters of CVDs deaths take place in low- and middle-income countries (1). Each year approximately one million patients worldwide undergo cardiac surgery such as CABG, valve repair or replacement, aneurysm repairs, and arrhythmia surgery (2). Patients awaiting cardiac surgery may

experience high levels of anxiety and significant symptoms of depression due to fears, worries and uncertainties about surgery. These can exacerbate symptoms of existing cardiovascular disease, adversely affect physiological parameters before and during anesthesia, and can result in prolonged recovery (3). The major nursing activity to ensure that the client is prepared for surgery is preoperative education (PE) (4).

**The Global Burden of Cardiovascular Disease**  
CVDs are a global public health issue that causes a severe economic burden at the societal level, affecting physical and psychosocial functioning, health-related quality of life and symptom management of the individuals (1,5). According to the World Health Organization (WHO), approximate-

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ly 17.7 million individuals, representing 31% of all global deaths, died because of CVD in 2015, it was reported that 7.4 million of these deaths were due to coronary heart disease and 6.7 million were due to stroke. It is also anticipated that until the year 2030, approximately 23.6 million individuals, mainly due to heart disease and stroke, will die of CVD (1). According to Bloom et al. (2011), a report prepared by the World Economic Forum the Harvard School of Public Health suggests that the cost of cardiovascular disease will rise by 22% in 2010 to 1,044 billion dollars (6). Effective and cheap medicines are available to treat almost all cardiovascular diseases, however if the symptoms of these diseases can not be controlled by pharmacological treatment, surgical treatment is appropriate for the management of these diseases (2,5). Cardiac surgery is typically the preferred treatment for many congenital or acquired heart diseases. Coronary artery bypass grafting (CABG) is used to treat coronary heart disease, valve surgery to repair or replace heart valves damaged by rheumatic fever, and congenital surgery to correct natal malformations of the heart structure such as arterial and ventricular septal defects. Although cardiac surgical treatment has shown superiority over medical treatment with major advances in care and surgical techniques in the past 20 years (7) it is classified as high risk due to the complexity compared to other minimal invasive cardiac procedures such as balloon angioplasty and stenting, longer recovery time (8) higher postoperative complications and mortality risks (2,5).

### **Anxiety and Depression Among Cardiac Surgery Patients**

Cardiac surgery is a challenging and saddening event also for patients and their families (5). It is stated that 60-80% of the patients who underwent surgical intervention develop anxiety in the preoperative period (9-12) and the experienced anxiety affects the emotional, physiological and cognitive states (4,5). Anxiety triggers the activation of the sympathetic nervous system and the hypothalamus-pituitary-adrenal axis, resulting in a variety of physiological responses such as increased oxygen consumption, decreased immune response, and altered coagulation and autonom-

ic tone (13). Many studies on cardiac reactivity against psychological stress factors have shown that anxiety can affect the regulation of autonomic nervous system, platelet activation, hypothalamic-pituitary-adrenal axis activity and myocardial effusion, which increases blood pressure, heart rate and cardiac outflow, inhibits gastrointestinal activity and decreases immune function (14,15). However, preoperative anxiety has been associated with exacerbation of symptoms of cardiovascular disease, increased use of anesthetic during surgery, increased postoperative pain, increased analgesic need, delayed wound healing, decreased immune response, fluid and electrolyte imbalance, increased infection rate and abnormal vital signs cause, depression, increase in readmission to the hospital and complications (3,4,10,16-20). Gouin ve Kiecolt-Glaser (2011) stated that greater fear or distress prior to surgery has been associated with poorer outcomes including longer hospital stays, more postoperative complications, and higher rates of rehospitalization. Among 309 consenting consecutive patients who underwent an elective coronary artery bypass graft surgery, patients who were more optimistic were less likely to be rehospitalized than less optimistic individuals. Conversely, patients who experienced more depressive symptoms were more likely to require readmission for infection-related complications than individuals reporting less distress (16). It is also stated that preoperative anxiety is an important risk factor for postoperative mortality in patients undergoing cardiac surgery (4,18, 21-25).

There are many reasons for the development of anxiety prior to surgery. These are being in the hospital, waiting for surgical intervention, preoperative preparation, lack of control, worry about recovery process, pain and discomfort after surgery, complications, fear of unknown procedures during postoperative care, uncertainty about daily life and return to work (3,5,26,27).

Concerns during preoperative period may encourage patients to ask questions about treatment and care, and may cause them to ask for help from health care providers (5). Berth et al. (2007) re-

ported that the anxiety level of the patients with more PE needs is higher (28). In a qualitative study conducted with twenty male cardiac surgery patients, it was indicated that the symptoms of preoperative anxiety and depression increased when patients' concerns were not adequately addressed by health care providers (29).

Health care providers play an important role in helping patients prepare for surgery by determining possible solutions for identifying, preventing, or reducing the causes of anxiety and monitoring patients' concerns (30). However, some studies on the subject<sup>30</sup> have showed that PE is not adequately implemented by health professionals.

### **Importance of Preoperative Education**

In addition to providing information and explanation about surgical procedures, expected patient behavior and anticipated sensations, PE is regarded as an interactive process providing appropriate assurance and psychosocial support to the patient who is going to be operated. PE positively affect patient to know what will happen in each stage of the surgery, feel better physically and mentally, improve the outcome of the surgery as well as helping them understand the role and responsibilities of own individual care and correcting misconceptions (4,31-33). PE is very important for anxious patients waiting for surgery. Because PE can reduce anxiety by making the unknown known (5). Although the PE needs of patients vary, most of the surgical patients prefer to receive comprehensive information about own health during preoperative period.

### **Components and Methods of Preoperative Education**

Traditionally, information is given to patients to understand the experiences that they will encounter during surgery, and this information is divided into three categories: procedural, sensory, and coping information.

**Procedural information** is associated with explaining medical events such as causes and consequences of the surgery, specific surgical procedures, instructions given in the postoperative period, and discharge.

**Sensory information** deals with feelings that patients experience during or after the operation, such as pain and discomfort.

**Coping information** includes exercises such as deep breathing and coughing exercises to minimize complications and improve postoperative function (5,34).

PE is applied in a variety of approaches and formats, such as written materials, audio-visual presentations, oral information in the form of individual counseling or group discussion, or combinations of some or all of these. Each approach has both advantages and limitations (5).

In cases where educational resources are inadequate, nurses give patients the information with an only way of verbal explanations, however it is stated that this method may be misunderstood by patients and their relatives and may easily be forgotten. In addition, it has been shown that the information given in written form without the oral explanation is perceived as complicated and difficult to understand by the patients (5,35). For this reason, it was reported that the provision of written materials, together with the oral information, is more effective in PE (36). In addition, the use of information brochures in emergency care services is strongly recommended to increase patient satisfaction.

It is necessary to provide the appropriate amount of information for the patients undergoing surgery. However, it is very important that the information is given to the patient in an adequate manner with an appropriate method, according to the individual requirement that the patient feels comfortable (5,33).

### **Role of the Nurses in Preoperative Education**

Nurses who have roles in the diagnosis, treatment and care of the patients and who are in constant communication with them play an active role in patient education (37,38). Nurses need to identify and meet the preoperative education needs of patients. The study of Gürlek and Yavuz (2013) that examined preoperative patient education practic-

es of nurses working in surgical clinics has reported that nurses often include preoperative patient education in their practices but there are some deficiencies in realization of education process (30). PE is one of the most important nursing interventions and an indispensable part of preoperative patient care. Meeting the education needs of patients is also an indication of quality patient care outcomes (39).

In the preoperative period, informing the patient and his/her relatives, educating and counseling is one of the most important responsibilities of a nurse. The nurse can help the patient cope with the difficulties encountered after the intervention by identifying the needs of the patient. Success of the education is directly related to education process with the individualized care, and to the evaluation of the patient's response and compliance (40). For this reason, patient's sharing of fear of surgical intervention and whether his/her expectations are met should be questioned.

The patient to be operated and the relatives of the patient have concerns and fears about anesthesia, surgical intervention, and the applications to be performed. It is stated that the patient and his/her family need to be informed in order to cope with these difficulties. The surgical nurse who has deep and comprehensive knowledge to coordinate the care of the surgical patient should inform the patient and the family about the applications and possibilities to be performed before, during and after the surgery (30,41).

The topics that patients and their relatives are required to be informed before surgery can be listed as diagnosis; preoperative diagnostic procedures; preparations; treatment; duration of operation, materials; frequency of visit; time that can be spent with patient; those who will give care to the patient after surgery; where they can wait during surgery; ways of communicating with the operation room and receiving information; tubes, drains, medications, possible complications that may occur after surgery; cardiac rehabilitation exercises (exercises that should be done; walking, breathing, coughing, etc.), and restrictions (30,41). Studies (4,5,18,19,21,23,32,33,38-

40,42-46) show that PE reduces patients' anxiety and analgesic need, increases satisfaction, shortens hospital stay time, and improves mental and physical healing by increasing quality of life. The outcomes of preoperative education in patients undergoing cardiac surgery are shown in Table 1 (2,4,18-20,23,31,46-54).

### **Some Literature Research on the Effectiveness of Preoperative Education**

The randomized controlled trial of Guo et al. (2012) on effects of PE initiative consisting of verbal advice and information brochure for Chinese cardiac patients on reducing anxiety and enhancement of healing reported that anxiety ( $p<0.001$ ) and depressions scores of participants who had received education before operations decreased more ( $p<0.001$ ) compared to those who had not received education, they also spent less time in intensive care unit ( $p=0.05$ ), and it was also stated that they had pain while sleeping, and there was no significant difference between participants in terms duration of hospital stay (31).

In the study of Al-Qalah et al. (2015) which examined the effectiveness of planned PE on care activities of patients who had a cardiac surgery, it was reported that 52% of the study group (those who get PE) and 82% of the control group had insufficient knowledge in pre-test period while 84% of the study group and 4% of the control group had sufficient knowledge for the post-test. In addition, PE has been associated with increase in the level of performance in the care activities of patients, early extubation, less analgesic requirement for coping with pain, shorter postoperative period, short duration of intensive care and less complication (2).

In the randomized controlled trial of Kalogianni et al. (2016) on the effects of nurse assisted PE on anxiety and postoperative complications of cardiac surgical patients, it was found that education given by nurses before surgery significantly decreased the anxiety of the experimental group ( $p<0.001$ ), experimental group had less chest infection, however PE was shown to be ineffective in reducing the length of stay in the hospital and in reducing readmissions (18).

**Table 1.** Outcomes of PE in patients undergoing cardiac surgery

Outcomes	Al-Qalah et al. QES, 2015, n=100	Ertürk and Ünlü, QES, 2018, n=109	Fredericks and Yaub, Systematic review, 2016, n=585 studies	Guo et al. RCT, 2012, n=153	Hosein et al. RCT, 2013, n=70	Loghmani and Monfared, analytical study, 2018, n=80	Kalogianni et al. RCT, 2016, n=395	Malek et al. RCT, 2018, n=160	Matthias and Samarasekera, a prospective study, 2012, n=100
Fear									
Anxiety		↓	↓	↓	↓		↓	↓	↓
Depression			↓		↓	↓			
Pain	↓	↓		=					
Analgesia requirement	↓								
Knowledge and self efficacy	↑								
Early extubation	↑								
Sleep Quality								↑	
Patient satisfaction									
Postoperative stay	↓								
ICU stay	↓								
Hospital stay							=		
Hospital readmission			↓				=		
Complications	↓						↓		
Recovery									

**Table 1.** Continued

Outcomes	Martorella et al. RCT, 2012, n=52	Ortiz et al. A survey, 2015	Ramesh et al. Systematic review and meta-analysis, 2017	Shahmansouri et al. RCT, 2014, n=60	Sorlie et al. RCT, 2007, n=109	Utriyaprasit et al. RCT, 2010, n=120	Varaiei et al. RCT, 2014, n=60	Zhang et al. Prospective and Randomized trial, 2012, n=40
Fear				↓				
Anxiety		=	↓	=	↓			↓
Depression			=		↓			
Pain	↓		=					
Analgesia requirement								
Knowledge and self efficacy							↑	
Early extubation								
Sleep Quality								
Patient satisfaction		↑						
Postoperative stay								
ICU stay								
Hospital stay			=					
Hospital readmission							↓	
Complications								↓
Recovery						↑		

ICU: Intensive Care Unit; QES: Quasi-experimental study; RCT: Randomised Controlled Study

= : No difference between control and experimental groups; ↓: Significant decrease in the experimental group; ↑: Significant increase in the experimental group

The randomized clinical trials of Malek et al. (2018) on effects of supportive-educative nursing interventions applied prior to coronary artery bypass graft surgery on anxiety and sleep of patients, it was identified that the mean anxiety score in the control group increased significantly ( $p<0,001$ ) while the educational nursing intervention applied in the experimental group decreased the mean anxiety score, and the sleep quality was found to be significantly higher in the experimental group (20).

In the quasi-experimental study conducted by Ertürk and Unlu (2018) to determine the effects of preoperative individualized education on anxiety and pain level of patients after open heart surgery, there was a statistically significant relationship between pre- and postoperative state anxiety scores and mean pain scores, and preoperative individualized education has been shown to reduce ( $p<0,05$ ) postoperative pain levels in both aspects (38).

## CONCLUSION

Many studies have investigated whether PE interventions are successful in improving postoperative outcomes and whether physical and psychological healing is improved after cardiac surgery. In addition, the effectiveness of PE on postoperative outcomes in patients undergoing cardiac surgery has not been clearly identified. For the patients undergoing cardiac surgery, it was observed that higher quality randomized studies are needed to provide stronger evidence for PE interventions to improve the postoperative outcomes. Although the PE is not at the required level to increase the health status, it can be concluded that the written and oral PE applied by a nurse has important contribution to the patient outcomes.

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