



The effect of preoperative training on postoperative depression in patients undergoing open heart surgery (2017)

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ABSTRACT

Background: The prevalence of cardiovascular diseases among people in industrialized and developing countries are increasing. A look at recent WHO statistics suggests that these diseases account for 23% of global mortality rates, which make up a significant proportion in comparison with other causes of mortality. It is safe to be said that cardiovascular diseases cause problems for people and cause worries in the community, including lack of presence at work, high cost of surgery and drugs, disability and other cases. Evidence suggests that coronary artery disease is associated with anxiety and depression, sleep disorders, severe fatigue, and emotional complaints, since the body and mind are not separate.

Objectives: By providing the necessary knowledge to patients, to a great extent, their mental problems can be prevented.

Materials and Methods: This is an analytical study that evaluates the effect of preoperative training on depression in patients undergoing cardiac surgery in Shahid Modares Hospital. This study was performed on 80 patients undergoing cardiac surgery who were randomly divided into two groups of control and test. Before operation (surgery), the depression of the two groups was measured by Beck's standard test. Then, the necessary training was given to the case (test) group. Then one month after the operation (surgery), the depression of the two groups was again measured and compared. The data collection tool was Beck's standard test, which grading scale indicates 7-0, mild depression, 8-14, moderate depression, and 15-26, severe depression.

Findings: The results of this study indicate that the training reduced the severe depression by 50% in the case group, but did not affect the mild to moderate depression. According to ($p < 0.001$), there is a significant difference between depression two groups of control and case (test), and severe depression in the case group has been reduced by half. In addition, the research hypothesis was confirmed with 95% confidence. According to the above findings, it can be said that training not only reduces the physical problems of individuals, but also affects the mental and psychological problems of individuals.

Conclusion: By communicating with patients and giving the necessary training in special wards, especially cardiac surgery, they can be more hopeful for their lives and their depression can be reduced and their recovery facilitated.

Keywords: cardiac surgery, patient education, depression

INTRODUCTION

Every second, one person dies due to cardiovascular disorders. This means that 2.3% of these people generally have coronary artery disease, which only had cardiac symptoms in the first few hours. In another statistic, one in every six people, or in every eight women over the age of 45, is suffered from myocardial infarction or stroke (1).

Mentioning reducing mortality from cardiovascular disease over the past 30 years, Harrison still puts it the most serious risk to human health, the main cause of death in developing countries (2). It is safe to say that no measure in the treatment of cardiovascular diseases has had as much effect on the quality of life of people with these diseases as heart surgery. This method was successfully tested for the first time in 1951, and since 1989, annually about 250 open heart surgeries is done using bypass (3).

Evidence suggests that coronary artery disease is associated with anxiety, depression, sleep disorders, severe fatigue, and emotional (affective) complaints (4). Brown Valdes also emphasizing the prevalence of neurological complications after open heart surgery suggests that these complications appear in the form of a lack of short-term memory, attention

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deficit (lack of concentration of senses) and mental changes, especially in the elderly. In the event that a coherent and rational training program is designed to provide these patients with necessary information, they can be expected to have a significant impact on their physical and psychosocial status (5). Jarsma about the changes observed in the general condition of patients with myocardial infarction or those who have undergone cardiac artery surgeries suggests that changes in the general condition of these patients can lead to self-care needs; so that in line with this, patients change their behavior in relation to risk factors and disease-causing factors (6). Cardiac patients with a heart attack, if they are depressed, the likelihood of their deaths is six to one year more than other patients, because depression causes chemical changes in the body. One of these changes is increased cortisol and serotonin secretion. These substances cause clots or damage to the walls of the arteries. Depression also causes changes in the rhythm and rate of the heart, and if there is a change in the rhythm of the heart after a heart attack or heart surgery, the likelihood of death is very high in one to six years later. But reducing depression, in any way, medication, training, or psychotherapy, significantly reduces the risk of death in these patients (7). If physical illness (disease) has a particular effect on one's life, there is often a risk of depression and its psychological consequences. This possibility is exacerbated in all physical conditions associated with high stress. Depression has devastating effects on the ability of patients to take care themselves, so that in cardiac patients with severe depression these abilities are reduced significantly. Studies show that depressed smokers often fail to leave smoking (7).

Many heart patients may show moderate to severe depression that this depression is a natural reaction, and may continue days, weeks, and even months after discharge. It is therefore necessary to address the psychological needs of patients during the recovery period (8).

Teaching (training) patients is a factor in the process of improving the patient and shortening the length of stay in the hospital. On the other hand, by impact of education (training) on improving the quality of life we can help to reduce mental, physical and recovery rates in these patients (9).

Teaching (educating) and supporting the patient in various aspects of physical and mental health is one of the main and important tasks of the nurses, but it is not possible to do so properly unless the patients' mental and physical problems and needs are fully investigated in this regard, through which the nurse will be able to design and implement care and treatment plans while informing and identifying the patient's problems and needs [10, 11]. In the pre-operative training program, factors that exacerbate psychosis after surgery and disorders arising from admission to the intensive care unit should be considered. Patients with post-operative psychosis may demonstrate themselves in depression, insomnia or nightmares. These abnormalities (disorders) resolve after a while, but before the surgery, they should be educated about the possibility of developing these mental disorders, because otherwise, the patients will think that they have a type of permanent brain or memory impairment [12].

Considering the importance and necessity of solving patients' problems, especially depression that occurs after heart surgery, the researcher believes that despite the importance of applying and infrastructural patterns of nursing in care of this group of patients, unfortunately in planning of therapeutic cares in the heart surgery wards the identification and evaluation of the patients' mental problems are less emphasized. So this study is intended by determining the effect of the necessary training to hospitalized patients, provide a more comprehensive and desirable planning in order to promote nursing care for patients undergoing cardiac surgery.

MATERIALS AND METHODS

This research was an analytical study of two groups of control and test, which were selected similarly in terms of demographic characteristics (or two groups were matched in terms of demographic characteristics).

The sample size was 80 patients undergoing cardiac surgery, divided into two groups: control and experience (test). This research was conducted in the heart surgery wards of Modarres Hospital in 2000.

The data collection tool was a questionnaire containing demographic data including sex, marital status, and education level, number of children, occupation, income and type of surgery. In the second part (Beck depression) 21 questions (4 options) with grades of 0-7, mild depression, 8-14, moderate depression and 15-26, severe depression, has been graded according to the psychiatrists of Imam Hossein Hospital in Tehran. This research is a preliminary and final test with a control group and random selection method two groups of control and test were randomly and similarly selected. First, from both groups, a preliminary test (Beck depression questionnaire) was performed then the test group was exposed on the effect of independent variable (training), while the control group was immune from this variable. In the end, again depression test was performed on two groups and then, a comparison was made between the scores of the mean scores

of the preliminary and final tests in the control and test groups. A comparison was also made between the mean scores of preliminary and final tests in each group.

The information gathering method included four stages:

The first stage: At first, the demographic data form and depression test was given to two groups of control and test, and the obtained score was considered a pre-test score or first-time score at hospital admission.

The second stage: The test group received the necessary training in two sessions, which the first session, training before surgery for 20-30 minutes individually or in group of 4 people on the nature of the disease, the type of disease, the cause of disease and the technique and complications of surgery, all preoperative measures and care activities were conducted in special care units. The training method included lecture, use of the educational booklet and visit the ICU unit. The second training session was conducted one day before surgery.

The third stage: The depression was measured in two groups of test and control one month after the operation (surgery), and the obtained score was considered as post-test or second-time score.

The fourth stage: Depression in two groups of control and test in the above mentioned stages was compared and the conclusion was conducted. Regarding the reliability and validity of Beck depression test, it is a standard test in Iran, which has already been tested for its reliability and validity. The validity and scientific credibility of Beck Depression Test has been confirmed by many researchers and psychologists. According to Kendall and Zali in 1970, stability of reliability and transferability (portability) are among the important factors that are reflected in the Beck test. In 1988, Beck and his colleagues used this test on the American population, and Metcalf and Goldman on the population of England in the same year, and Partov in 1970, and Musapoor in 1971 on the Iranian population. The Beck test is the best known test for determining depression, since a person can find and choose at any stage his/her status, which indicates the clinical state of depression. The Beck Depression Test is known as a test independent of a particular culture and even is not dedicated to a specific social class, and is not specific to any particular economic and educational class. This suggests that any person in the community in each social and economic class (poor or rich) can be tested by this test and the depth of his/her depression can be measured (13).

To analyze the collected data and information, the descriptive and inferential statistics were used. The research data were designed as absolute and relative frequency distribution tables and the used tests were Chi-square and t-test.

Objectives of the Study

Overall objective: Determining the effect of preoperative training on postoperative depression in patients undergoing open heart surgery.

Special goals:

1. Determination of preoperative depression (first turn) in the groups of control and test.
2. Determination of postoperative depression (second turn) in two groups of control and test.
3. Comparison of depression in two groups of control and test (first and second turns), and after the training and surgery.

The research hypothesis: The education (training) reduces depression in patients undergoing cardiac surgery.

RESULTS

In this study, 80 patients undergoing cardiac surgery in Shahid Modarres Hospital of Tehran in 2000 were studied divided into two groups of control and test. The two groups were consistent with each other in terms of demographic characteristics (age, gender, number of children, income, surgery, and education), so the impact of these variables on the research results was the same.

The following results show that in the test group, before training (education) 17.5% of people had mild depression, 22.5% moderate depression and 50% severe complications. In the control group of first turn, 20% of patients experienced mild depression, 20% moderate depression and 90% severe depression (**Table 1**). Also, in the test group in the second turn, after the training, it was determined that 35% of the subjects had mild depression, 40% moderate depression and 25% severe depression, with these percentages in the second turn of control group were 17.5% mild depression, 22.5% moderate depression and 60% severe depression that did not change compared to the first turn (**Table 3**). In the comparison of depression of the control group in the first and second turns it was showed that mild depression decreased from 20% to 17.5%, moderate depression increased from 20% to 22.5%, and severe depression from 60% did not change so that there was no statistically significant difference between the two first and second turns using T-test (**Table 4**).

Table 1: Comparison of preoperative and pre-training depression in the test group and first turn and the control group in patients undergoing open heart surgery

Scores group	Experiment (test)		Control		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Preoperative depression						
No depression	0	0	1	2.5	1	25.1
Almost no depression (1)	0	0	1	2.5	1	25.1
Inconsiderable (2-3)	1	2.5	2	5	3	3.75
Mild (3-7)	6	15	4	10	10	12.5
Moderate (8-10) (more than mild)	8	20	5	12.5	13	16.25
Moderate (11-14)	5	12.5	3	7.5	10	12.5
Less than severe (15-26)	20	50	24	60	44	55
Total	40	100	40	100	80	100
Mean		16.20		16.85		16.52
Standard deviation		8.79		9.47		9.27

Test of Mean Comparison df= 78 p= 0.75 t= 0.21

Table 2: Comparison of depression before and after training in the experimental (test) group in patients undergoing open heart surgery

The rate of depression	Test group	Before surgery		After surgery	
		Number	Percentage	Number	Percentage
No depression		0	0	2	5
Almost no depression (1)		0	0	2	2.5
Inconsiderable (2-3)		1	2.5	3	7.5
Mild (3-7)		6	15	8	20
Moderate (8-10) (more than mild)		8	20	8	20.0
Moderate (11-14)		5	12.5	8	20.0
Less than severe (15-26)		20	50.0	10	25.0
Total		40	100	40	100
Mean			16.12		9.82
Standard deviation			8.57		5.33

Test of Mean Comparison df=39 p=0.001 paired t=5.42

Comparing depression rate in the first and second turns in the test group, it was found that mild depression of patients from 17.5% has reached to 35%, moderate depression from 22.5% to 40%, while severe depression has been decreased from 50% to 25% that using t-test ($p < 0.001$), there was a significant difference between the mean depression before and after training (**Table 2**).

Also, comparing the rate of preoperative depression in the first turn in the control and test groups, it was found that severe depression was 60% in the control group and 50% in the test group. Also, the mean of depression severity in the test group was 16.20 with standard deviation of 8.79 and 16.85 with a standard deviation of 9.83 in the control group that considering $p = 0.75$, there was no significant difference in depression between two groups in the first turn or before surgery (**Table 1**). Concerning the comparison of depression rate, one month after the operation and in the second turn in the two groups, it was found that severe depression in patients in the experimental group decreased from 50% to 25%, while in the control group it did not change. Mean depression in the experimental group was 9.82 with a standard deviation of 5.33 and in the control group 9.27 with a standard deviation of 11.56. According to the t test ($p < 0.001$), there was a significant statistical difference between the two groups (**Table 2**).

According to **Table 1**, the rate of depression in the control group before the surgery (first turn) was mild (20%), moderate (20%), severe (60%) and depression in the experience (test) group before surgery (before the training) was mild (17.5%), moderate (22.5) and severe (50%). According to calculated $p = 0.75$, which is larger than the table ($p = 0.05$), there was no significant difference in the severe depression between control and test groups.

According to **Table 2**, in the experimental group, patients' severe depression decreased from 25% before surgery to 5% after surgery. Considering the calculated $p = 0.001$ is smaller than the table $p = 0.05$, also, the change in the mean of depression score before training from 16.12 to 9.82 after training, a significant difference between two measurements of depression in the test group was found.

According to **Table 3**, the depression control group after surgery (second turn) was mild (22.5%), moderate (20%) and severe (60%), and depression in the experimental group after the training (second turn) was (mild) 35%), moderate (40%) and severe (25%). According to the calculated $p = 0.001$, there is a significant difference in depression between the control and test groups after training, and severe depression in the test group has been halved.

Table 3: Comparison of depression one month after operation (surgery), after training in the test group and in second turn in the control group in patients undergoing open heart surgery

Postoperative depression	Scores group	Experiment (test)		Control		Total	
		Number	Percentage	Number	Percentage	Number	Percentage
No depression		2	5.0	2	5.0	2	5.0
Almost no depression (1)		12.5	0	0	1	1	1.3
Inconsiderable (2-3)		3	7.5	1	2.5	4	5.0
Mild (3-7)		8	20	4	10.0	12	15.0
Moderate (8-10) (more than mild)		8	20	4	10.0	12	15.0
Moderate (11-14)		8	20	5	12.5	13	16.25
Less than severe (15-26)		10	12.5	24	60.0	34	42.5
Total		40	100	40	100	80	100
Mean			9.82		9.27		14.5
Standard deviation			5.33		11.56		10.13

Test of Mean Comparison df=78 p=0.001 paired t=4.69

Table 4: The depression rate before and after training in the test group in patients undergoing open heart surgery

The rate of depression	Test group	Before surgery		After surgery	
		Number	Percentage	Number	Percentage
No depression		1	2.5	2	5.0
Almost no depression (1)		1	2.5	0	0
Inconsiderable (2-3)		2	5.0	1	2.5
Mild (3-7)		4	10.0	4	10.0
Moderate (8-10) (more than mild)		4	12.5	4	12.5
Moderate (11-14)		5	12.5	4	12.5
Less than severe (15-26)		24	7.5	5	60.0
Total		40	100	40	100
Mean			16.77		19.27
Standard deviation			9.82		11.56

Test of Mean Comparison df=39 p=0.10 paired t=1.68

According to **Table 4**, the severity depression in patients in the control group (60%) before surgery was not changed with the rate of depression after surgery (60%). According to **Table 1** and calculated P, which is larger than ($P = 0.5$) as well as, the difference in depression in measuring the first turn of the control group (16.77) and measuring the second turn (19.27), showed that there was no significant difference between the mean score of the depression in the control group in two measurements.

DISCUSSION AND CONCLUSION

An open heart surgery is one of the most stressful psychological pressures one can bring to a heart patient. As a result of this study, a high percentage of patients suffered from severe depression before surgery. In various studies, high rates of depression and other psychiatric disorders has been reported. In a study by a group of researchers in the system university health, it was found that 45% of the patients had a depression before the surgery and 32% of the patients in the one year after the surgery. Although surgery can improve the physical condition of patients, the symptoms of depression would be present in the forms of verbal sluggish and deficits in memory and precision of patients. They also found that mortality was higher in patients who were depressed after heart surgery than in other patients. Therefore, by talking to patients and encouraging them to take antidepressants, their mortality can be significantly reduced (14). In a study by Ruth and colleagues in 1992 as the analysis of the factors exacerbating depression after myocardial infarction, it was found that emotions such as anxiety and depression and various forms of depressive mood develop immediately after an acute heart attack and also, the prevalence of major depressive disorder among patients after acute myocardial infarction over time is more likely to be manifested which along with coronary artery disease and depression a reduction in social activities can be seen (15). Concerning the first goal of the study, according to **Table 1** and using the paired T-test, no significant difference was found between the two groups in the first and second turns ($p=0.75$). Concerning the second goal of the study, as shown in **Table 2**, there was a significant difference between the level of depression before and after training in the test group using the paired T-test. In a study by Shieldham and Fleming in 2002 entitled "the effect of preoperative training on CABG post-operative improvement in a UK-based sample," the subjects were divided into two groups of control and test. For the test group, training was given from the time of admission and routine care

until the patient was admitted to the hospital. The questionnaire of this study was comprised of various parts with 36 questions on health status, questions about anxiety and depression, questions about the general condition and a standard for measuring pain. After analyzing the data, it was found that 6 months after surgery, there was a significant difference between the scores before and after the training, so that for anxiety ($p=0.09$), pain (0.09), for depression ($p=0.29$) and for general condition ($p=0.11$). The results also showed that there is a significant statistical difference between the length of stay in the hospital between the control group and the test (16).

In relation to the third goal of the study, according to **Table 3** in the test group, severe depression decreased from 50% before surgery to 25% after surgery. In case of severe depression, the control group had the same 60% and did not change. According to ($P = 0.001$), there was a significant difference in severe depression in the second turn between the experimental (test) and control groups. In a study conducted by Becker in January 2005 entitled "the relationship between depression and post-operative coronary artery bypass graft", it was found in people with clinical symptoms of depression and undergoing cardiac surgery 6 months after surgery, death (mortality) risk can be increased and training for patients can reduce to 70% the risk of death (mortality) (17). In another study conducted in Tehran in 2001 by Basampoor, entitled the effect of education (training) on the amount of anxiety about cardiac surgery, it was concluded that 95% of the anxiety of patients in the test group was reduced. And, as we know, anxiety for a long time will become depression (18).

Educating (training) the patient, in addition to improving his/her individual ability to take care of himself/herself in terms of physical condition, will increase the patient's awareness, self-confidence and hopefulness. Salsali (2002) suggests: According to the theory of the American Nursing Association, part of the important duties of the nurse is teaching (educating) patients. The nurse has a duty to recognize the learning and educational needs, provide the necessary training to the patient, and then evaluate it, since education (training) can interfere with the patient's follow-up of his or her health (19). Among the limitations of this research, we can mention family, social, cultural, supportive system, communication style problems and not uniformity of physical, psychological and emotional state of patients.

The results of the above research can support the researcher. Therefore, preoperative training can greatly reduce its postoperative depression and prevent its irreversible complications and even mortality. Therefore, according to the above tables, the researcher has achieved all the goals and the research hypothesis has been proved (confirmed). Therefore, according to the results of this study, indicating teaching (training) to cardiac patients reduces postoperative depression it is recommended that people working in the heart surgery wards, consider one of their most important duties in the ward, training of patients about their self-care and talking with them to reduce their depression. Emotional stress in hospitalized patients, especially in intense wards, is due to concerns about the response to the illness and hospitalization in the heart surgery departments.

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