Enhancing Awareness regarding Postoperative Care among Patients undergoing Open Heart Surgery

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Abstract

Background: The patient, after open-heart surgery, presents with multiple, rapidly changing clinical problems. Educating the patient is the nurse's responsibility, which is one of the most important aspects of post-open heart surgery. **Aim of the study:** To enhance awareness regarding postoperative care among patients undergoing open heart surgery. **Design:** A Quasi-experimental research design was used to achieve the aim of the present study. **Setting:** The study was conducted at the Cardio-Thoracic Intensive Care Unit at Sohag University Hospital**. Patients:** A convenient sample of 50 open-heart surgery patients was recruited. **Tools:** Two tools were used in this study for data collection: Tool I: A structured Interview Questionnaire and Tool II: Patients Biopsychosocial Needs Interview Questionnaire**. Results:** There were significant differences in the total knowledge mean scores among patients undergoing open heart surgery pre and post-awareness programs. There were highly significant improvements in total Physical needs, psychological needs, and Social Dysfunction of the studied patients at (P= < 0.01) pre and post awareness program. **Conclusion:** The study concluded that the application of an awareness program has a positive effect on enhancing postoperative care among patients undergoing open heart surgery. Also, there was a significant improvement in the total knowledge level among patients undergoing open heart surgery **post** awareness program**. Recommendations:** To increase patient knowledge and lower complications, the open heart surgery awareness program should be carried out, discussed, incorporated into rehabilitation programs, and taught to patients using the booklet and illustrated pamphlets for each patient. The results of the current study must be replicated with a larger sample of patients undergoing heart surgery in various settings to generalize the findings.

***Keywords*:** Awareness, enhancing, postoperative care, patients undergoing open heart surgery

Introduction:

Surgery on the heart muscle, valves, arteries, or other heart components is known as open heart surgery. The chest is opened during this procedure. It's a significant surgery that necessitates a week-long hospital stay. Open cardiac surgery. Immediately following surgery, the patient will stay in the intensive care unit. It's done to let blood flow around the heart's clogged blood vessels. Open cardiac procedures such as Coronary Artery Bypass Grafting (CABG) and valve replacements have been used to improve patient outcomes related to cardiac symptoms, prolongation of life, and health-related quality of life. Although these surgical outcomes are beneficial, research has suggested that the experience and recovery process after open-heart surgery may be more complex than anticipated and presents psychosocial and physical challenges that will continue after hospital discharge (**Stromberg, 2021).**

It was reported that about 53% of patients undergoing (CABG) with cardiopulmonary Bypass (CPBG) had an abnormal neurocognitive function at discharge, 24% of them continued to have neurologic abnormalities 6 months after their cardiac surgery, and after the procedure, 42% of patients showed cognitive deterioration five years later. Delirium is linked to a higher long-term death rate and affects up to 10% of

individuals over 65. Mild deficiencies in language, memory, attention, and concentration are among the other early postoperative neurocognitive impairments that affect up to 60% of patients (**Areias et al., 2021**).

Following open heart surgery, complications can include arrhythmias, myocardial depression with or without myocardial necrosis, low cardiac output syndrome, excessive bleeding following the procedure or as a result of coagulopathy, uncontrolled hypertension, and neuropsychological dysfunction (**American Heart Association, 2022).**

Achieving sufficient hemodynamic performance by optimizing myocardial oxygen supply and demand is the main goal of postoperative open heart patient management. Oxygen delivery and demand calculations can be used to assess optimal tissue oxygenation, which is necessary to prevent organ malfunction. The ability of the heart to convey oxygen and cardiac output determines oxygen delivery. Oxygen consumption determines oxygen demand (**Mosleh et al., 2019**).

The patient after open-heart surgery presents with multiple, rapidly changing clinical problems. Initially, these patients are unstable, and their clinical status is extremely fluid and dynamic. Caring for the postoperative open-heart patient requires bedside presence and the knowledge of general fundamental concepts of patient care as well as concepts specific to this set of patients. The initial management of these patients as they return from the operating room is critical, for it may well set the tone for the rest of the recovery period. Clinical errors at this time can have far-reaching implications. The initial management should begin even before the patient arrives in the intensive care unit (ICU). It is vital to review the chart, noting indications for surgery, preoperative hemodynamic data, comorbid conditions, medications, and allergies **(Kapwata & Manda, 2018).**

Neurological outcomes following heart surgery centered on neurological and psychological dysfunction that was clinically evident, including depression, disorientation, and stroke. Following open heart surgery, exercise and activity are crucial for a successful recovery and will assist patients in returning to a more active lifestyle. This is due to the increasing use of neuro-psychometric testing, which usually includes assessments of language and memory. Continuous aerobic training helps the heart and lungs function more effectively by using the big muscle groups. It also aids in reducing other heart disease and stroke risk factors (**Stromberg, 2021).**

In clinical practice, the biopsychosocial assessment expands the area of health and illness examination, which is crucial for disease prevention, treatment, and evaluation, particularly in open heart surgery. Because it involves heart transplants, repair of damaged structures, coronary artery bypasses, and other therapies like the insertion of medical devices, all of which are complex procedures requiring highly skilled doctors with specialized knowledge. For a patient having open heart surgery, the professional nurse's involvement in both pre- and post-operative care helps ensure a favorable outcome (**Mokbel et al., 2020**).

As soon as the patient enters the intensive care unit, conduct a thorough and methodical evaluation of them. Address the surgical and anesthetic staff immediately to start the evaluation. Ask about any intraoperative occurrences that might have affected the patient's postoperative course, and find out what surgery was performed in the operating room. Next, perform a physical examination of the patient as part of this preliminary assessment. Avoid concentrating on any one issue during the initial assessment and try to get a comprehensive picture of the patient's clinical status because the patient is fully dependent on support systems at this point, and any one of these systems failing can be disastrous. The following factors need to be monitored: heart rate and rhythm, blood pressure, temperature, right and left heart filling pressures, hemodynamic profile, pharmacologic support, ventilator status, chest drainage, neurologic status, laboratory results, EKG, and chest X-ray. It is crucial to have a thorough understanding of the specific monitoring and drug delivery lines, as well as the location of the drains. Upon completion of the initial assessment, specific issues can be identified, prioritized, and addressed **(American Heart Association, 2022).**

According to professional surgical evaluation, nurses are vital members of the healthcare team

and play a significant role in the overall medical result. They treat patients who have had adult heart surgery at different intervention and health education levels. To provide patients with the right nursing care and education and improve their health, the nurse must be fully aware of their needs (**White et al., 2019).**

Patient education is one of the most crucial components of patient preparation, and it falls under the purview of nursing. This should not be done at the last minute but rather during the patient's hospital stay. Every day, patients should receive information on sternal precautions, incision care, meals, activity level forecasts, painkillers, medications, and infection signs and symptoms. Additionally, families should be involved in their children's care whenever possible, particularly if they will be providing incision care (**Karim, 2020).**

Significance of the study

The fundamental objective is to keep or enhance patients' health and, in certain cases, to slow their decline. A patient who is knowledgeable and educated can take an active role in their care, improve outcomes, help identify mistakes, and reduce hospital stays. The medical component of health education includes health and wellness prevention information and practices. Research indicates that identifying the various essential needs of patients is the first step toward providing effective health education (Pachman et al., 2018). Priority should be given to patient triage and care in the open heart surgery department. However, because biopsychosocial case complexity may potentially impact patient health outcomes and isn't examined in this context, the study's goal is to enhance awareness regarding postoperative care among patients undergoing open heart surgery.

Aim of the study

This study aimed to enhance awareness regarding postoperative care among patients undergoing open heart surgery.

Research hypothesis

H_1- Patients undergoing open heart surgery who received an awareness program regarding postoperative care would experience an improvement in their knowledge mean scores post-implementation than pre-implementation.

H_2- Patients undergoing open heart surgery who received an awareness program regarding postoperative care would experience an improvement in their dependency on Activities of Daily Living level mean scores post-implementation than pre-implementation.

H_3- Patients undergoing open heart surgery who received an awareness program regarding postoperative care would experience a reduction in their pain mean scores post-implementation than pre-implementation.

H_4- Patients undergoing open heart surgery who received an awareness program regarding postoperative care would experience a reduction in their anxiety mean scores post-implementation than pre-implementation.

H_5- Patients undergoing open heart surgery who received an awareness program regarding postoperative care would experience an improvement in their social dysfunction post-implementation than pre-implementation.

Subjects and Methods:

Research design:

A Quasi-experimental research design was used to achieve the aim of the present study (pre and post-one group).

Setting:

The study was conducted at the Cardio-Thoracic Intensive Care Unit at Sohag University Hospital**.**

Sample:

A convenient sample of 50 patients undergoing open heart surgery was recruited.

Tools of data collection:

Two tools were used in this study for data collection:

Tool (I): A structured interview questionnaire

This tool was developed by the researcher based on pertinent literature and consists of two parts, as follows.

Part One: Patients' Demographic Characteristics Data

It contained information on the age, education, occupation, and place of residence of patients having open heart surgery.

Part Two: Patients' Health Relevant Data

It contained the medical history of patients having open heart surgery, including the current surgery name, surgical history, and medical diagnosis. Additionally, it contained information on current medical conditions,

prescription drugs, prior hospital stays, surgical procedures (including the kind and length of the procedure), and family history.

Part three: Open Heart Surgery Knowledge for Patients: (pre/post)

This part was developed by the researchers based on the assessment of relevant research studies and literature. Ten multiple-choice questions were included. The purpose of the test was to evaluate patients' understanding of open heart surgery, including general information about the procedure, brief anatomy of the heart, meaning, indication, complications, management, and discharge plan, as well as different diagnostic procedures and how to prepare for them. It also evaluated the advantages of surgical management. Information about common health issues after surgery, medications after discharge, risk factors, effective nutrition, medical therapy after surgery, follow-up and incision care, exercise program and activities after discharge, and information sources about their knowledge.

Scoring system:

All of the items, which varied from 0 to 10, were added up to determine the final score. The patients' total knowledge score was divided into the following categories: More than 60% of the overall score indicates a satisfactory level of knowledge, whereas less than or equal to 60% of the total score indicates an unsatisfactory level of knowledge.

Tool II: Patients Biopsychosocial Needs Interview Questionnaire

This tool was developed by the researchers after examining relevant literature, and it contained the following parts:

Part (A): Physical Needs among Patients Undergoing Open Heart Surgery: It included:

Pain Assessment Scale (9): Using a Likert scale, patients undergoing open heart surgery had their pain evaluated. This part was adopted from **Galer and Gammaiton (2003**), which the researcher used in this investigation. It comprises 20 items designed to evaluate how patients after open heart surgery perceive and feel pain. From 0 (no pain) to 10 (severe pain), the patients' responses varied.

Scoring system: The sum of all components, which varied from 0 to 100, was used to determine the overall score. The total score is divided into the following categories: Zero is regarded as not experiencing any pain. Pain will be deemed mild if it accounts for less than or equal to 30% of the overall score. A pain score of 31-60% will be regarded as moderate. Severe pain is defined as more than 60% of the overall score.

2. Katz Index of Independence in Activities of Daily Living (Katz ADL) for Patients undergoing Open Heart Surgery. Katz et al. (2007) created this scale, which the researcher modified. The basic activities of daily living were measured to evaluate the physical needs of patients both before and after open heart surgery. The ability to take care of oneself is measured by the Katz ADL index. The six items on the test measure how independent or dependent a person is on others for tasks including dressing, toileting, bathing, transferring, feeding, and continence. In each of the six functions, patients receive a yes/no score for independence.

Scoring system: Six represented full function, four represented moderate impairment, and two or fewer represented severe functional impairment. The scores ranged from 0 to 6.

Part (B): Psychological Assessment among Patients with Open Heart Surgery (Zung**,** 1996**):** In this part, patients undergoing open heart surgery had their psychological needs evaluated using the Zung scale for anxiety. It was created in 1996 by Zung. In this investigation, the researcher modified it. A self-administered exam consisting of 20 questions was used to gauge the patient's psychological requirements and anxiety level. Using a 4-point Likert scale, the patient answers on a scale of 1 (none or a little of the time) to 4 (most or all of the time). Out of the 20 questions, 15 ask about rising anxiety levels, and 5 ask about falling anxiety levels.

Scoring system:

All items with raw scores ranging from 20 to 80 were added up to determine the final score. Next, using the conversion chart, convert the total raw score to the anxiety index. Note the matching anxiety index score, which varied between 25 and 100. The anxiety index and the clinical interpretation chart were compared as follows: These are the categories for the

anxiety index score: - - The usual range was shown below 45. Anxiety levels between -45 and -59 were classified as mild to moderate, -60 to -74 as marked to severe, and -75 and higher as excessive.

Part (C): Social Dysfunction Rating Scale for Patients with Open Heart Surgery (Ian, 2006**):** It was Ian (2006) who created this scale. In this investigation, the researcher modified it. Twenty elements made up the assessment of social requirements for patients undergoing open heart surgery. In response, the patient used a Likert scale with 1 denoting "none" and 6 denoting "very severe."

Scoring system:
The sum of all the elements, which ranged from 20 to 120, was used to determine the final score. The total score is grouped as follows. A score of less than or equal to 60% indicates a modest level of social disorder. 2. A high degree of social dysfunction is indicated by more than 60% of the overall score.

The procedure of data collection:
Preparatory phase:
Creating the data collection tools involved examining the literature that was previously and currently available as well as the theoretical understanding of different research components using booklets, articles, the internet, journals, and magazines.

Tool development:
The researcher produced and translated the study tools into Arabic based on a review of the literature, adjusted them to each subject's level of comprehension, and had English language experts test their translation.

Validity and reliability of the tool:
Three professors with expertise in medical surgical nursing and two professors with expertise in critical care nursing comprised the board of five expert professors who examined the tool's content validity. In accordance with the panel's ruling, no changes were made to guarantee content appropriateness and clarity. Cronbach's alpha test was used to test the reliability of the study tools. The results showed that the structured interview schedule contributed 0.71, the Pain Assessment Scale contributed 0.74, the Katz Index of Independence in Activities of Daily Living contributed 0.83, the Psychological Assessment for Patients with Open Heart Surgery contributed 0.79, and the Social Dysfunction Rating Scale for Patients with Open Heart Surgery contributed 0.81.

Administrative design:
The directors of the department that was initially chosen were given administrative approval to conduct this study and get authorization for data collection through a letter sent by the Faculty of Nursing.

Ethical considerations:
Both the Ethical Committee of Research and the Faculty Dean sent a formal letter. Before starting the study, the researchers met with the directors of the settings they had already chosen to explain the purpose and solicit their involvement. Initially, each participant's written agreement was obtained after the nurses were informed of the study's goals. They were told that they might leave the study at any moment, for any reason, and that participation was entirely optional. The participants were informed that the information they provided would be kept private and used exclusively for research.

Pilot Study:
To assess the clarity, practicality, and applicability of the research procedure, a pilot study was carried out on 10% (5).

Fieldwork:

- The researchers spent two days per week, from 9 a.m. to 1 p.m., visiting the previously chosen locations.
- After introducing themselves, they met the patients and went over the purpose of the study with the participants. Data was gathered in six months. It took about fifty to sixty minutes to finish the interview.
- Data was gathered between March 2023 and August 2023, a span of six months.

The collection of data was done through four phases:
I- Assessment phase:

During this stage, the researchers gathered information from the patients under study. In order to gather patient data at the initial point of admission, the researcher employed Tool (I) A structured Interview Schedule. The patient who satisfied the inclusion criteria was evaluated in three stages and included in the study. "-" Tool (I) evaluated each patient's demographic information (age, sex, educational attainment, prior employment), medical and surgical history (chronic conditions, medications, prior hospitalization, prior surgery, availability of health services, and reasons for using it), and patients' understanding of open heart surgery (indication, complications, management, and discharge plan). Additionally, the researcher employed tool (II) to evaluate the biopsychosocial demands of patients undergoing open heart surgery. Patients undergoing open heart surgery had their physical needs (pain evaluation, basic daily living tasks like clothing, bathing, toileting, transferring, continence, and feeding) evaluated in part (A), their psychological needs evaluated in part (B), and their social needs evaluated in part (C).

II- Planning phase:

During this phase, the researchers explained to patients undergoing open heart surgery the benefits of the awareness program, The contents were available to the patients through a colored booklet.

Awareness program were designed based on an analysis of the actual patients' knowledge level in the pretest. The content of the booklet was written in simple Arabic language and was consistent with the related literature.

III- Implementation phase:

The data-gathering techniques indicated earlier were used to conduct individual interviews with each patient. Each patient involved in the study received an explanation from the researcher about the study's goal. After the procedure, data was gathered starting on the second day after the patient was able to fill out the interview form. Before and one month after the study intervention began, participants completed the study instruments.

The data collection tools were distributed to the studied patients undergoing open heart surgery twice: (1) pre-test to assess their knowledge, physical, psychological, and social needs before implementing an awareness program and post-test to assess patients undergoing open heart surgery after one month of awareness program implementation.

The simplified booklet was used as supportive material and given to patients undergoing open heart surgery in the Arabic language to cover all items of open heart surgery after reviewing the related literature based on the assessment of the actual needs of the studied patients. Different teaching methods, such as lectures, discussions, pictures, and posters, were used.

The subject contents have been sequenced through 4 sessions, and each session took about 25-30 minutes. The total time was about 2 hours. At the beginning of the first session, an introduction about the awareness program regarding open heart surgery was given, and each session started with summary feedback about the previous session.

The content of the awareness program regarding open heart surgery is as follows:

- General information about the surgery
- Brief anatomy of the heart
- Indication of open heart surgery
- Complications of open heart surgery
- Various diagnostic procedures and how to be prepared for them
- Benefits of surgical management
- Risk factor
- Systemic complications after cardiac surgery
- Information about how to reduce or prevent postoperative complications through medical therapy after surgery
- Common health problems post-surgery
- Medications post-discharge
- Healthy nutrition
- Overview of fatigue
- Weight control
- Care of wound site Physical activity and exercises

- Smoking cessation

IV- (Evaluation phase):

Evaluation was conducted by interviewing patients post one month by using the same tools used in the pre-test to enhance awareness regarding postoperative care among patients undergoing open heart surgery**.**

Statistical analysis:

Data entry and statistical analysis were performed using SPSS for Windows, version 20. Frequencies and percentages for qualitative variables and mean and SDs for quantitative variables were represented as descriptive statistics. Differences between the two means tests (t-test) were used. The chi-square (x2) test was used to compare qualitative parameters. Pearson's correlation coefficient (r) test was used. Statistical significance was considered at P-value <0.05.

Results:

Table (1) shows that less than half (48%) of the studied patients ranged between 50-60 years with Mean ±SD **50.22±3.23**year years, and 64% of them were male. Regarding residence, 58% of the studied patients were living in rural areas. In addition, less than half (42%) of the studied patients were working.

Table (2) presents In relation to the history of chronic diseases, it was observed that all (100%) studied patients had a history of heart disease, also, (64%) of them had a history of hypertension. Regarding previous admission to the hospital, the vast majority (96%) of the studied patients were admitted to the hospital previously. In addition, all (100%) studied patients received medication before. Less than half (42%) of them had a history of appendectomy. Finally, this table revealed that more than half (56%) of the studied patients didn't have a family history of cardiac problems.

Figure (1): Portrays that 52% of the studied patient**s** reported that their main source of information about knowledge regarding open heart surgery was doctors.

Table (3): Illustrates that an improvement in the studied patients' knowledge was observed post implementing awareness program as compared to pre-awareness program. Also, there was a highly statistically significant difference between the total patients' knowledge **mean scores** pre and post-awareness program implementation (P-value <0.001).

Figure (2) shows that (96%) of the studied patients had an unsatisfactory total knowledge level regarding postoperative care among patients undergoing open heart surgery pre and post- awareness program and decreased to 16% post-awareness program implementation.

Table (4): Portrays that an improvement in pain score among the studied patients undergoing open heart surgery was observed post-implementing awareness program compared to pre- awareness program. Also, there was a highly statistically significant difference between total patients' pain mean scores pre and post-awareness program implementation (P-value <0.001).

Figure (3) shows that (94%) of the studied patients had severe total pain level among patients undergoing open heart surgery **pre and post-** awareness **program** and decreased to become 20% post- awareness **program** implementation.

When comparing the pre- and post-awareness program, **Figure 4** shows a significant difference (P=0.001) in the overall patients' reliance mean scores in activities of the daily living level following heart surgery. Ninety-two percent of them had seriously impaired function before the awareness session, and this number dropped to eight percent after the program.

Table (5): Shows that an improvement in the studied patients' **anxiety** was observed post implementing the awareness program as compared to pre- awareness program. Also, There was a highly statistically significant difference between total patients' **anxiety mean scores** pre and post-awareness program implementation (P-value <0.001).

Figure (5) shows that (56%) of the studied patients had severe total **anxiety** level among patients undergoing

open heart surgery **pre and post-awareness program** and decreased to become no one post-awareness **program** implementation.

According to Table (6), the study patients' mean scores for total social dysfunction improved after the awareness program was implemented as opposed to before. Additionally, there was a highly significant difference between the mean scores for all patients' social dysfunction before and after the awareness program was implemented (P-value <0.001).

Table (1): Distribution of the studied patients undergoing open heart surgery **according to their demographic data**

Demographic data	The studied patients (n=50)	
	N	%
Age (year)		
20 - < 30	5	10.0
30 - < 40	7	14.0
40 - < 50	14	28.0
50 – 60	**24**	**48.0**
Mean ±SD 50.22±3.23		
Gender		
Male	**32**	**64.0**
Female	18	36.0
Residence		
Rural	**29**	**58.0**
Urban	21	42.0
Educational level		
Read & write	4	8.0
Basic education	9	18.0
Secondary education	**28**	**56.0**
University education	9	18.**0**
Employment		
Working	**21**	**42.0**
Not working	20	40.0
Housewife	9	18.**0**

Table (2): Distribution of the studied patients undergoing open heart surgery regarding their past and current health history

Past and Current Medical History of Patients	The studied Patients (n=50)	
	N	%
Suffering from chronic diseases		
No	0	0.0
Hypertension	32	64.0
Diabetes	20	40.0
Heart disease	50	100.0
Osteoporosis	1	2.0
Joints stiffens	1	2.0
Kidney disease	2	4.0
Chest disease	8	16.0
Chronic obstructive pulmonary disease (COPD)	11	22.0
Rheumatoid	1	2.0
Previous admission to the hospital		
Yes	**48**	**96.0**
No	2	**4.0**
Medication received before		
Yes	**50**	**100.0**
No	0	0.0
Having surgical history		
Yes	16	32.0
No	**34**	**68.0**
Type of surgery		
Appendectomy	**21**	**42.0**
Hernia repair	14	28.0
Tonsillectomy	10	20.0
Caesarean section	5	10.0
Family history of cardiac problems		
No	**28**	**56.0**
Arteriosclerosis	2	4.0
Patent ductus arteriosus (PDA)	3	6.0
Angina pectoris	10	20.0
Heart attacks	7	14.0

More than one answer

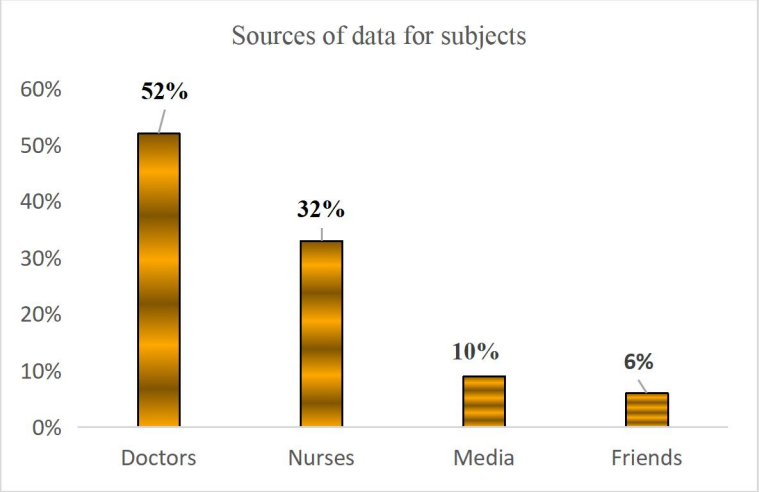

Figure (1): Percentage distribution of the studied patients regarding their source of knowledge about open heart surgery (n=50)

Table (3): Patients' knowledge mean scores differences related to open heart surgery pre and post-awareness program (n=50).

Items	Pre-awareness program	Post- awareness program	X2	P-value
Patients' nurses' knowledge mean scores	3.34±1.11	8.43 ±1.33	56.44	<0.001

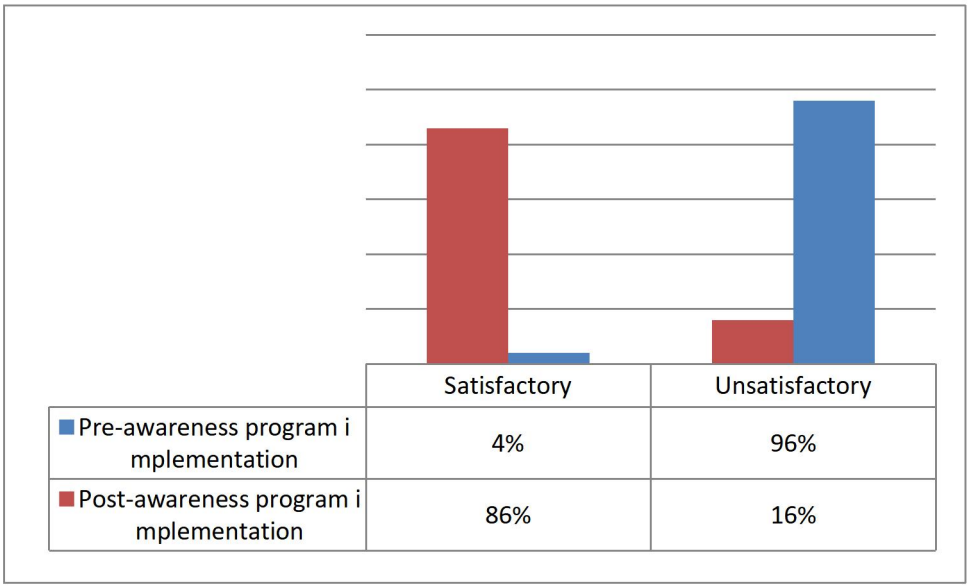

Figure (2) Total knowledge level regarding postoperative care among patients undergoing open heart surgery pre and post- awareness program (n=50).

Table (4): Comparison between patients' pain related to open heart surgery pre and post-awareness program (n=50).

Levels of total pain score	Pre- awareness program		Post- awareness program		P - value
	N	%	N	%	
No pain	3	6.0	10	20.0	<0.001
Mild	11	22.0	20	40.0	
Moderate	26	52.0	17	34.0	
Severe	10	20.0	3	6.0	

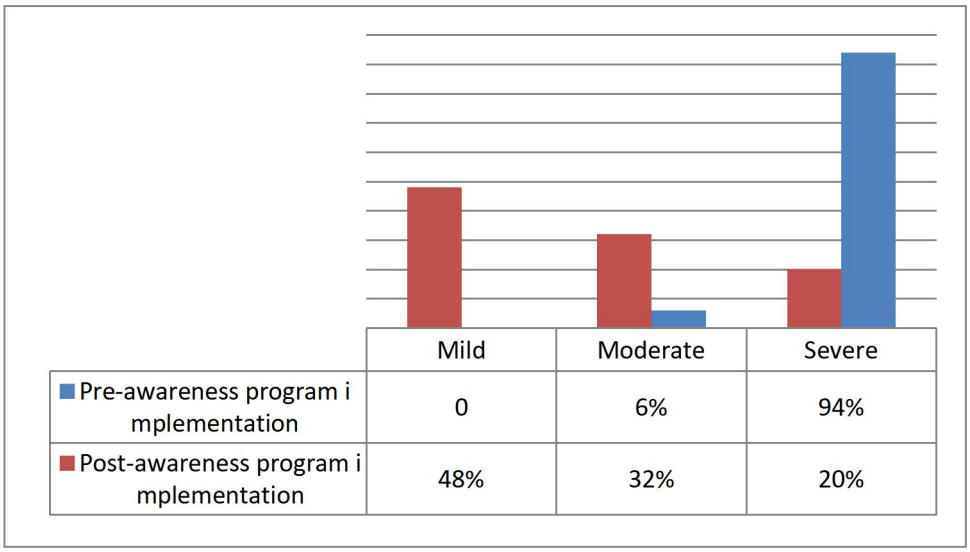

Figure (3) Total pain level among patients undergoing open heart surgery pre and post-awareness program implementation **(n=50).**

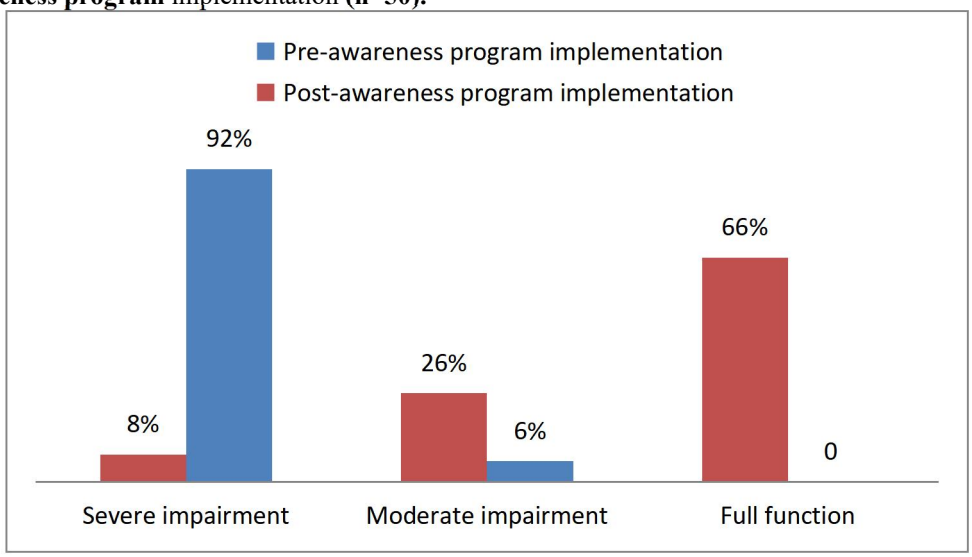

Figure (4): Distribution of the studied patients undergoing open heart surgery according to their Independency in Activities of Daily Living Pre and Post awareness program implementation (n=50)

Table (5): Patients' anxiety mean scores differences related to open heart surgery pre and post- awareness program (n=50).

Items	Pre- awareness program	Post- awareness program	X2	P-value
Patients' **nurses' mean anxiety scores**	63.34±4.22	38.55 ±1.78	59.78	<0.001

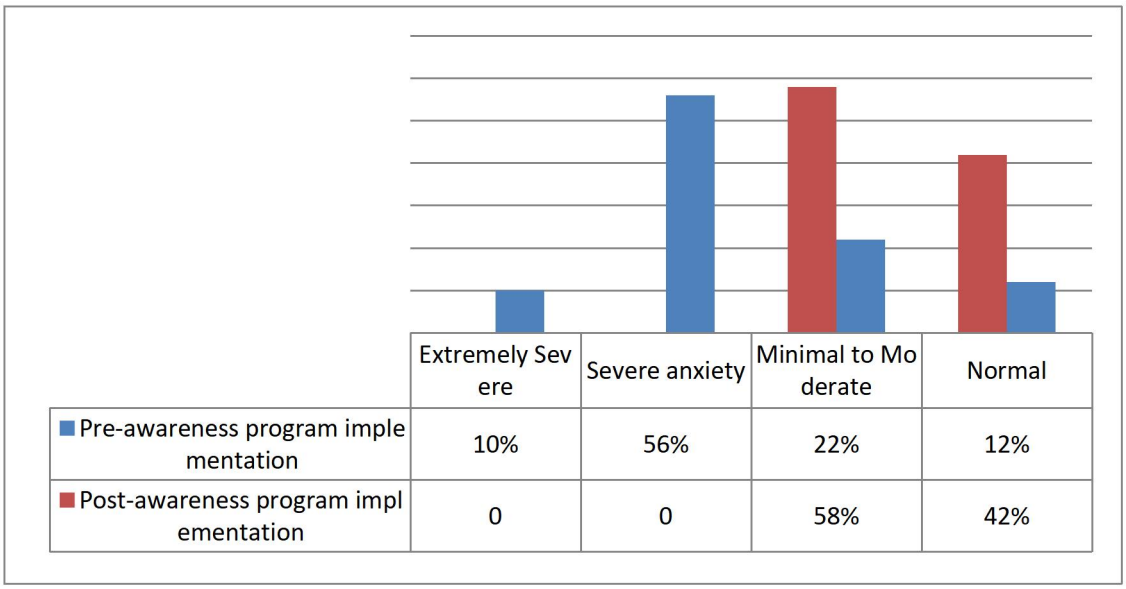

Figure (5) Total anxiety level among patients undergoing open heart surgery pre and post-awareness program implementation **(n=50).**

Table (6): Total social dysfunction mean scores among patients undergoing open heart surgery pre and post-awareness program implementation **(n=50).**

Total social dysfunction mean scores.	The studied Patients (n=50)			
	Pre- awareness program	**Post-** awareness program	**t-test**	**P - value**
	83.55±4.67	48.56 ±2.69	64.89	<0.001

Discussion:

Following open heart surgery, patients frequently worry about if their quality of life will decline and whether they will be able to continue receiving care with confidence (**Mosleh et al. 2019**). In order to help patients get the skills and knowledge necessary to manage their care after heart surgery, nurses should concentrate on patient education and support (**Rushton et al 2020).**

An operation to fix damage to the heart is called open heart surgery. For patients undergoing open heart surgery, determining their needs is crucial to promoting their recovery and assisting them in managing any health issues. The biological model, which viewed illnesses and treatment choices within a physiological framework and held that health resulted from the absence of disease, was thought to need to give way to the biopsychosocial (BPS) evaluation **(Emre, 2020).**

Evaluation of the patient's bio-psychosocial requirements both before and after open heart surgery is a critical component of patient-centered care. This suggests that the biological, psychological, and social subsystems are all

interconnected and dependent on one another and that each system influences the others. Thus, biological, psychological, and social aspects interact with one another in each patient. People's physiological processes are referred to as biological needs; their knowledge, feelings, thoughts, and beliefs are referred to as psychological needs, and the impact of society and its norms and values on an individual is referred to as social needs (**Smith et al., 2023).**
Open heart surgery is a complex technique that calls for highly skilled experts with specialized knowledge of coronary artery bypass, damaged structural repair, heart transplantation, and other therapies, including implanting medical devices. According to **Mokbel et al. (2020)**, a professional nurse's thorough understanding of the demands of patients undergoing open heart surgery was, therefore advantageous in ensuring a favorable patient outcome.
Males made up fewer than two-thirds of the sample, and almost two-fifths of the patients were between the ages of 50 and 60, according to the study's findings. According to the experts, the occurrence of heart disease may be related to the fact that patients' ages increase the pace of metabolism and catabolism, among other things. In addition to reducing the patient's physical activity, this impairment may worsen the functioning of the body's organs. Additionally, older people are more susceptible to a variety of illnesses and health issues.

This finding is consistent with that of Leathy & Jada (2019), who found that the average age of the sample under study was 40 (range: 20–55). A study by **Amaal F et al. (2020**) also showed that the average age of the sample under examination was 45.9±11.7 years, with a range of 50 to 59 years. Additionally, this can be the result of genetic factors and poor lifestyle choices, which suggest that estrogen may protect women from heart disease. This result aligned with research by **Dibardino et al. (2022),** that found that over half of the sample was male. It is in line with the findings of Kang et al. (2019), who looked at "Correlates of Health Behaviors in Patients" and discovered that men predominate.

The current study's findings regarding educational attainment showed that over half of the patients had only completed secondary school, which could be a contributing factor to their poor treatment adherence. **Mosleh et al. (2019)** discovered that almost half of the sample had completed secondary school, which supported this. Another study by Amaal et al. (2020) found that the majority of the patients under examination were illiterate, which was in contrast to our findings. Furthermore, roughly one-third of the subjects were university graduates, according to **Abdelghany et al. (2019).**

The results of this survey showed that over half of the sample as a whole lived in rural areas. According to the experts, it can be explained that guys are more likely to suffer from heart disease that requires heart surgery due to factors including smoking, obesity, and decreased activity. Inadequate resources to obtain enough information about their illness also contributed to the knowledge gap. The absence of health care, longer diagnosis times, and lower educational attainment in rural areas could all be contributing factors. According to **Kapwata & Manda (2021**), cardiovascular disease and morbidity and mortality rose with increasing distance from healthcare services. This conclusion was consistent with their findings. The study's findings demonstrated that, in comparison to before the awareness program was implemented, the patients' und. Knowledge had improved thereafter. Additionally, there was a highly significant difference in the mean scores of all patients' knowledge before and after the execution of the awareness program, becoming worse as well. Furthermore, the majority of the patients in our study were from rural areas, which is consistent with another study by **Amaal et al. (2020).**

Salari et al. (2019) found that most of the participants in their study on "Risk factor control, medication adherence, and follow-up visit, five years after coronary artery bypass graft surgery" were urban dwellers. This finding contradicts their findings. About half of the patients in this study were employed, according to the findings of the current study. This could be because of increased job strain and stress from not having a job. This supported the findings of **Ferrario et al. (2019),** who found that manual laborers had higher incidence rates of coronary heart disease.

The study's findings demonstrated that, in comparison to before the awareness program was implemented, the patients' understanding had improved thereafter. Additionally, there was a highly significant difference in the mean scores of all patients' knowledge before and after the execution of the awareness program.

According to the results of this study, which were based on the patients' medical history, all of the patients had cardiac disease, and over two-thirds of them had hypertension, which may have been brought on by poor treatment compliance, genetics, or bad lifestyle choices. In line with **Lancellotti et al. (2020**), who showed that most participants complained of congenital heart disease (CHD) and a small percentage had valvular heart disease, **Bassand et al. (2019)** discovered that around two-thirds of patients had More than half of the patients in this study said that doctors were the primary source of their information on open heart surgery, according to the study's findings. This finding indicates that patients got their information from the correct source, according to the researchers.

The study's findings demonstrated that, in comparison to before the awareness program was implemented, the patients' knowledge had improved thereafter. Additionally, there was a highly significant difference in the mean scores of all patients' knowledge before and after the execution of the awareness program. The results, according to the researchers, demonstrate the benefits of implementing awareness programs that satisfy the demands of adult patients and give them the knowledge they need to preserve their health and lessen their worries. This improvement demonstrates the impact of the program and highlights the willingness of the majority of patients to learn more about their ailments. The findings of **Buket & Ebru's (2019**) study on the "effect of a structured patient education intervention on the quality of life for coronary artery bypass grafting patients" are comparable to this one. They found that structured, planned education for patients undergoing heart surgery was successful in raising their knowledge levels.

The study found that nearly all of the patients had unsatisfactory postoperative care knowledge both before and after the awareness program was implemented. This knowledge dropped to fewer than one-fifth of the patients after open heart surgery. This could be because over half of the patients in the study had only completed secondary school and lived in a rural region. This is consistent with the findings of **Mosleh et al. (2020**), who discovered that the main requirements of patients were learning about wound care, medicine, and complications following an intervention.

These findings were corroborated **by Piper and Stewart (2020).** They discovered that a successful health education program will lower fatigue, risky behavior, and numerous postoperative complications. It will also result in changes that increase knowledge about specific medical and health-related issues for a prolonged period.

This outcome is in line with a study by **Sepehri et al. (2024),** which discovered that the educational intervention was successful in improving the physical functioning of patients who had heart surgery and raising their level of knowledge through planned education that could help them deal with these challenges in their day-to-day activities following the procedure.

In a similar vein, a study by **Akbari and Çelik (2019)** discovered that educational interventions positively impact patients' cardiac self-efficacy. It also helped to lessen their level of weariness. According to **Rief et al. (2019**), a study titled "Preoperative Optimization of patient expectations Improves Long-term outcome in Heart Surgery Patients" demonstrated that increasing patients' awareness about heart surgery contributes to better treatment outcomes.

In reference to the pain experienced by patients after open heart surgery, the current study shows that, as compared to before the awareness program was implemented, there was an improvement in the patients' pain scores. Additionally, there was a highly significant difference in the mean pain levels of all patients before and after the implementation of the awareness program. The researchers' perspective demonstrated how well the awareness campaign worked to lessen patients' suffering after open heart surgery. The purpose and theories of the current investigation were in line with these findings.

The present study showed that most of the studied patients had severe total **pain** level among patients undergoing open heart surgery

pre and post- awareness **program** and decreased to become one-fifth post- awareness **program** implementation. According to the researchers, it demonstrated how well the awareness program worked to reduce pain and validated the notable improvement in the patient's degree of pain, which represented the primary objectives of the awareness program's execution. The leg and chest surgery wounds may be the cause of this. The same was true of **Ziehm et al. (2022**). Additionally, patients reported higher degrees of discomfort after surgery than they did before, according to **Ballan & Lee (2020).** In contrast to our findings, a different study by Khalil NS et al. (2018) found that using lavender oil inhalation during the initial days following open heart surgery can reduce the use of opioids and analgesics.

According to the current study, there was a significant difference between the pre-and post-awareness programs in the total patients' dependency means scores in activities of daily living level following heart surgery. This could be because of the patient's overall health and pain following the procedure, or it could be because of the clinical health state related to open heart surgery.

This was confirmed by **van Laar et al. (2020**), who discovered that up to fewer than half of the samples had less physical activity after surgery than they had before. Furthermore, **Kulik et al. (2020**) found that patients' physical limitations increased after surgery compared to before.

The current study found that the patient's level of anxiety following surgery was observed post implementing awareness program as compared to pre- awareness program. Additionally, there was a highly significant difference in the mean anxiety scores of all patients before and after the implementation of the awareness program. Lack of pre-operative psychological preparation and ignorance of open heart surgery could be the cause of this. Additionally, physical health and the perception of pain intensity are strongly correlated with emotional mood (**Hariharan et al., 2019). Gallagher & McKinley (2023**) provided support for this, stating that the amount of anxiety increased by up to half of the sample following surgery compared to before. Furthermore, **Tully & Baker (2022)** provided evidence for this, stating that up to half of the samples had melancholy following surgery, compared to before this procedure.

According to the current study, over half of the patients who were undergoing open heart surgery experienced extreme levels of anxiety both before and after the awareness program was put into place. After the program had been implemented, the patients' levels of worry were reduced to zero. The researchers believed that it demonstrated how well awareness programs were implemented. This could be brought on by discomfort, the patient's relationship, and a lack of understanding of open heart surgery. **Roohafza et al. (2022**) provided confirmation for this, stating that there were more psychological changes following surgery than there were prior to it.

The results of this study showed that, in comparison to before the awareness program was implemented, there was an improvement in the mean scores for total social dysfunction among the patients under study. This could be the result of inadequate treatment adherence or a delayed recovery. This was corroborated by **Spaderna et al. (2019)**, who reported that, in comparison to before surgery, less than two-thirds of the study participants experienced social isolation following surgery.

The current study's findings showed that the mean scores for all patients' social dysfunction before and after the awareness program was put into place differed in a highly statistically significant way. These findings are consistent with those of **Fredericks & Yau (2020**), who investigated the "Clinical effectiveness of individual patient education in heart surgery patients" and found that patient education programs drastically decreased anxiety in patients undergoing heart surgery while also improving health behavior performance and general social function outcomes.

Conclusion:

It can be concluded from the results of the study that, the application of awareness program has a positive effect on enhancing postoperative care among patients undergoing open heart surgery. Also, there was a

significant improvement in the total knowledge level among patients undergoing open heart surgery **post** awareness program**.**

Recommendations:

Based on the findings of the present study, these suggestions were recommended:

- The awareness program regarding open heart surgery should be conducted, discussed, and integrated into the rehabilitation programs.
- Taught the patients using the booklet and illustrated pamphlets for each one to improve their information and reduce their complications
- Replication of the current study with a larger sample of patients undergoing cardiac surgery in different settings is required for generalizing the results.
- It is advised to conduct routine preoperative and postoperative evaluations of patients having open heart surgery in order to determine their individual bio-psychosocial needs, as well as any risk factors, and to lower the likelihood of complications following the procedure.
- Incorporating post-operative patient education into standard nursing practice can help patients feel less anxious and have better post-operative outcomes.

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