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Effect of video-assisted prehabilitation program on patients' outcomes undergoing coronary artery bypass grafting

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***Abstract*---**Background: Cardiovascular rehabilitation is a safe and efficient method of treating patients who have experienced cardiac problems. For patients undergoing coronary artery bypass graft (CABG) surgery, it can considerably lower their mortality rates and improve patients' physical fitness. The study aimed to evaluate the effect of a video-assisted prehabilitation program on patient's outcomes undergoing coronary artery bypass grafting. Research design: A quasi-experimental research approach was used to achieve the aim of this study. Setting: The study was conducted in the inpatient department and outpatient clinics at Heart Academy- El-Demerdash Hospital, affiliated with Ain Shams University Hospitals in Egypt. Subject: A purposive sample of 100 adult patients undergoing CABG was included

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in the study. Tools: four tools were utilized for data collection: Tool (I): A structured interview questionnaire, Tool (II): Patients' knowledge regarding coronary artery bypass graft (pre/post). Tool (III): Patients' practices regarding exercises post CABG (pre/post), Tool (IV): Assessment of physical activity and functional capacity for patients through a six-minute walking test, Borg Rating of Perceived Exertion (RPE). Results: There was a positive significant correlation ($P<0.005$) between patients' knowledge and practice scores post-video-assisted prehabilitation program implementation. After the video-assisted prehabilitation program implementation, there were significant improvements ($P<0.005$) in patients' knowledge and practice regarding coronary artery bypass graft. Additionally, there was a relation between the knowledge scores, total practice scores, and patients' demographic data (age, educational status, and occupation). There was a statistically significant difference in general health regarding Physical function, pain, Physical performance, and validity. A highly statistically significant difference was also found regarding the 6-minute walk test, and statistical significance was perceived regarding exertion scale post-video-assisted prehabilitation program implementation than pre-implementation. Conclusion: The present study concluded that the implementation of the video-assisted prehabilitation program has a positive effect on improving outcomes for patients undergoing coronary artery bypass grafting. Recommendations: video-assisted prehabilitation program implementation should be taught to patients undergoing coronary artery bypass grafting to improve their outcomes.

***Keywords*---**Coronary artery bypass grafting, Patient's outcomes, video-assisted prehabilitation program.

Introduction

Among the most common cardiac procedures worldwide, coronary artery bypass graft (CABG) surgery is usually carried out with favorable results and a comparatively low 30-day death" rate (1.5%). It has been shown in more recent years that the care chain for patients after CABG surgery can save money and boost efficiency. With patients being released on the seventh postoperative day (average), the length of hospital stay has significantly decreased. Patients' self-management abilities are being demanded by these efficiency-driven early discharge policies. Even though patient counseling and guidance during recovery are widely recognized to be beneficial, early discharge limits the amount of time doctors can spend with their patients in the immediate postoperative phase (Lie et al., 2022).

Following their release from the hospital, patients frequently feel nervous or unsure about their symptoms or if they should exercise. These concerns are normally addressed while a patient is in the hospital; however, following discharge, patients frequently have trouble recalling specific details and are unsure of whom to ask inquiries of. Therefore, the benefits of a shorter hospital stay could be outweighed by avoidable unplanned healthcare utilization, particularly if planned treatment doesn't start for several weeks following discharge (Report to Congress, 2021).

Currently, 15% of patients visit the emergency room within a month following CABG surgery, and approximately 1 in 7 patients are readmitted within 30 days of discharge for non-cardiac reasons. Medicare was expected to have paid US $151 million in 2005 for potentially avoidable readmissions following CABG surgery, resulting in a major financial burden on society. The number of patients undergoing CABG surgery is anticipated to rise in the future, making this a critical issue that calls for review and maybe a redesign of postoperative follow-up care (Shawon et al., 2021).

The World Health Organization defines "the cost-effective and secure use of information and communication technologies in support of health and healthrelated fields" as a broad category that includes a variety of digital interventions that can help with postoperative patient guidance and patient-centered care delivery, potentially lowering the use of unplanned medical services (World Health Organization, 2020). Numerous health initiatives have been effectively implemented in postoperative follow-up and have been demonstrated to enhance patient outcomes, expedite recovery, and lower healthcare utilization across a range of surgical groups. Furthermore, eHealth has demonstrated benefits for patients seeking to improve their self-management by gaining a deeper comprehension of their condition, gaining more autonomy, and feeling more comfortable following lifestyle recommendations. However, there is no data on the effectiveness of eHealth interventions in patients who have had CABG surgery, and it is uncertain whether these tactics would work in this population (van Steenbergen, 2021).

A blood vessel from another area of the body is removed during coronary artery bypass surgery (CABG) to restore blood flow past the restricted portion of the artery. One end of the blood vessel is grafted to the blocked coronary artery below the blockage or constriction, while the other end is linked to the aorta to bypass the obstruction. To restore blood flow to the blocked coronary artery, a bypass graft is a surgical procedure that involves implanting a blood vessel to the blockage site. Of individuals who suffer from a significant disease in the left main corona artery, have three diseased vessels, or have left ventricular ejection fractions (LVEF) more than 3% are candidates for CABG. Surgical revascularization (CABG) has smaller long-term morbidity and mortality rates than medication therapy or percutaneous procedures like angioplasty or stents (Goldstein et al., 2022).

In comparison to other domains, leg and chest wounds, medications, and complications were considered by patients and nurses to be the most important areas for learning. This can be inferred from the extent of problems associated with CABG operation. Furthermore, patients may have been more compliant with medication regimens and treatment plans because they were concerned about wound infections and the possibility of being readmitted to the hospital (AlMaskariet al., 2021). The primary goal of cardiac rehabilitation (CR) is to improve a patient's functional capacity, emotional state, and general sense of well-being to aid in their recovery as fast and thoroughly as possible. The secondary goals of CR are to improve patients' quality of life, manage risk factors, and improve psychological status (Alfaraidhy et al., 2022).

Enhancing a person's functional ability before surgery can lower the risk of problems and increase the likelihood of a successful outcome. This approach is

known as prehabilitation or PREHAB. For patients who have suffered cardiac events (CR), cardiovascular rehabilitation is a safe and effective treatment option. Medical evaluation, prescribed exercise, medical education, and counseling are all included in the comprehensive, long-term programs known as cardiac rehabilitation services. They also involve changing cardiac risk factors. The goals of these programs are to manage heart-related symptoms, decrease the impact of atherosclerosis on patients' quality of life, lower the risk of myocardial infarction or sudden death, improve the psychosocial and occupational status of a specific patient population, and slow or stop the progression of heart disease (Bozkurt et al., 2021).

The utilization of video-assisted teaching methods offers a significant avenue for investigating an inventive approach to raising awareness. Additionally, it enhances practice in handling life-threatening circumstances and brings about positive changes in knowledge. Staff nurses could enhance the quality of care by improving and honing their current skills and knowledge through training with the video teaching method (Basnett, et al., 2016). Furthermore, because nurses work varied schedules and are unable to attend in-person training sessions, it is crucial to continue their education and update their knowledge and practices. Online learning and video-assisted teaching modules have become popular substitutes for traditional methods of offering nurses continuous education (Safwat & Khorais, 2018). To increase nurses' knowledge and proficiency, a variety of instructional techniques are employed, including self-education, video-assisted instruction, discussion, demonstration, and lecturing. The technique used to electronically capture, record, store, transmit, and reconstruct a series of images showing moving scenes is known as video. It also aids in overcoming linguistic problems because pictures speak for themselves (Balasubramanian et al., 2018).

The video modality simplifies complex subjects and circumstances for nurses to comprehend by offering them in visual, audio, and motion formats. Additionally, because it presents knowledge in a manner that oral descriptions or voice alone just cannot, it can serve as a bridge across educational barriers. On the other hand, the movie is easier for nurses who are not very good readers to understand. Moreover, one of the most significant new technologies that aid nurses—especially those who perform grueling procedures—is video-assisted. Additionally, the need for better teaching and learning strategies for nurses has been greatly impacted by technology. Different approaches and modern ways are needed while teaching different talents. So, it is thought that video-based learning is an effective teaching strategy. One benefit of learning through videos is that viewers can hear the presenter's voice. Additionally, the depictions, motions, figures, and demonstrations are visible (Devi et al., 2019).

Significance of the study:
Patients awaiting coronary artery bypass grafting (CABG) surgery are often aware of the possibility of physical activity. Preoperative rehabilitation can be undertaken by patients throughout this waiting period, increasing the safety and efficacy of any potential surgical intervention and encouraging continuing postoperative rehabilitation participation. A quick and creative way to involve today's nursing workforce is through the use of video teaching methods in nursing education. Any level of nursing education can readily use video teaching interventions, which are regarded as a crucial component of nursing education that connects theory and

practice. To improve the learning environment, it is now demanded of nurses to use creative technology (Devi et al., 2019). So, the aim of the study was to evaluate the effect of a video-assisted prehabilitation program on patients' outcomes undergoing coronary artery bypass grafting.

The study aims:

To evaluate the effect of video-assisted prehabilitation program (VAPP) on patient outcomes undergoing coronary artery bypass grafting through:

- Assessing patients' level of knowledge about coronary artery bypass graft.
- Assessing Patients' level of practice regarding post-coronary artery bypass graft exercises.
- Assessing patients' level of physical activity and functional capacity.
- Designing and implementing a VAPP based on the patient's actual needs.
- Determining the effectiveness of VAPP on patients' outcomes undergoing coronary artery bypass grafting.
- Determining the correlation between knowledge and practice pre- and post-video-assisted prehabilitation program.

Research hypothesis:

- Patients who will receive the video-assisted prehabilitation program will have satisfactory knowledge regarding coronary artery bypass grafting after the program implementation, compared to before the program implementation.
- Patients who will receive the video-assisted prehabilitation program will have adequate practice regarding coronary artery bypass grafting exercises after the program implementation, compared to before the program implementation.
- Patients who will receive the video-assisted prehabilitation program will exhibit better physical activity and functional capacity.

Four designs were adopted for this study to discuss the current its subjects and method:

I. Technical
II. Operational
III. Administrative
IV. Statistical

Technical Design:
It covers topics including subject, setting, design, and data collection methods.

Research design:
This study used a quasi-experimental research approach to accomplish its goal. In a quasi-experimental study, patients are randomly allocated to one of several therapy groups or self-select to investigate the true efficacy and safety of nonrandomized treatments (Maciejewski, 2020).

Setting:

The study was conducted in the inpatient department and outpatient clinics at Heart Academy-El-Demerdash Hospital, which is affiliated to Ain Shams University Hospitals in Egypt.

Subjects:
A purposive sample of 100 adult patients undergoing coronary artery bypass grafting (CABG) was included in the current study; adult male and female patients, available at the time of data collection, had access to a smartphone with an internet connection and were able to communicate. The sample size was calculated based on the improvement of patients' knowledge about CABG (Saboula et al. 2020) using the G*Power 3.1.9.7 software with 90% power of the study, 5% alpha error probability, and 0.622 effect size. The calculated sample was 91 patients and 10% were added because of the possibility of dropout becoming 100 patients.

Data collection tool:
Tool (1): A structured interview questionnaire: the researchers established this tool following reviewing the related literature (Pačarić, et al., 2020; Shawon et al., 2021; Rancic et al., 2020), **it encompassed the following parts:**

Part one: It included four items related to the demographic data of the studied patients such as age, gender, educational level, and occupation.

Part two: It included four items related to the medical data of the studied patients such as smoking, co-morbidities included (hypertension, diabetes, impaired liver function, and obstructive pulmonary disease), previous attendance to training sessions regarding coronary artery bypass graft surgery, and their source of information.

Part three: - Patients' General Health Assessment Checklist developed by (Rancic et al., 2020): It includes physical function, pain level, physical performance, and validity). Physical function by using (dependent on self, independent on self); pain by using pain scale, physical performance (light, moderate, and heavy) according to performance of patients after surgery and validity (energy or tired).
Scoring system for pain scale: The pain scale has 10 items which are utilized in this (0) no pain, (1-3) mild pain, (4-6) Moderate pain, (7-10) severe pain (Haefeli & Elfering, 2006).

Tool (II): Patients' **knowledge regarding** coronary artery bypass graft surgery **(pre/post)** (Pačarić et al., 2020; Rancic et al., 2020; Shawon et al., 2021; van Steenbergen, 2021): It was developed by researchers to assess patients' knowledge regarding CABG surgery. It included (10) questions in the form of multiple-choice related to the introduction about coronary artery bypass graft surgery, the meaning of coronary artery bypass graft surgery, indications for coronary artery bypass graft surgery, risks of coronary artery bypass surgery**,** Pre-operative examinations, Patients' preparation before surgery**,** Patients' preparation during surgery, Patients' preparation after surgery**,** Complications following coronary artery bypass graft surgery such as (bleeding, infection, reactions to anesthesia, damage to tissues in the heart, kidneys, liver, and lungs, and stroke), sleep, Walking, and eating habits post-surgery.

The scoring of knowledge: Once the interview questions were answered, the information was confirmed using a model key response. As a result, accurate responses received one point while unknowing or inaccurate ones received zero. There is more than one right response to some questions. There were ten questions, and the total score ranged from 0 to 20. Patients were deemed to have an adequate level of knowledge if their overall knowledge score was ≥60%, whereas inadequate knowledge was referred to when the overall score was <60%.

Tool (III): Patients' **practice regarding** coronary artery bypass graft surgery **(pre/post)**: It was developed by the researchers to assess Patients' practice regarding coronary artery bypass graft surgery (Pačarić et al., 2020, van Steenbergen, 2021): It included exercises that must be done pre and post-surgery to improve respiratory functions such as breathing and coughing exercises, the correct way to cough after surgery), Wound care and leg clot prevention tips through wearing compression stockings first thing in the morning. That's when the leg is usually the least swollen. Wear stockings every day, smooth the compression stocking, and pull it on so that there are no bunches or kinks. Also, check that the seams of the stocking run straight up your legs. Additionally, ask patients to check their legs every day for redness, irritations, or other skin issues.

Scoring system:

A score of two points was assigned to each item for each step that was completed successfully, one point for each step that was completed erroneously, and zero points for steps that were not completed. A practice level of less than 60% was deemed inadequate, whereas a practice level of 60% or higher was deemed adequate.

Tool (IV): Assessment of physical activity and functional capacity for the patient: included two parts:

Part 1: Six-minute walking test (Du et al., 2009): It is a straightforward exam that doesn't call for sophisticated gear or prior experience. It has been used to evaluate prognosis, therapeutic outcomes, and exercise tolerance. As a result, one possible use for this test could be in cardiac rehabilitation. Having the patient walk for six minutes while observing and recording the degree of dyspnea: nothing at all dyspnea, very slight, slight, moderate, somewhat severe, and severe dyspnea.

Part 2: The Borg Rating of Perceived Exertion (RPE) scale (Pageaux, 2016): It is a widely used scale that allows individuals to subjectively rate their perceived level of physical exertion or effort during an activity. It is a valuable tool in exercise and rehabilitation settings, including for patients undergoing coronary artery bypass graft (CABG) surgery. The Borg RPE scale typically ranges from 6 to 20, with 6 representing "no exertion at all" and 20 representing "maximal exertion." Patients are asked to rate their perceived level of effort on this scale, providing a subjective measure of their physical strain during an activity or exercise. A score of effort 6–7 denotes no effort at all, 7.5–8 is extremely light, 9-10 is very light, 11-12 light exertion, 13-14 somewhat hard exertion, 15-16 is hard or heavy exertion, 17-18 is very hard, and19-20 is maximal exertion.

Tools validity:

Five experts—two were medical staff members from the Heart Academy-El Demerdash Hospital, two from the medical surgical nursing, and one expert in

critical care nursing—determined the content validity of the tool based on its clarity, relevance, comprehensiveness, understanding, and applicability. They also had to assign a score to the items' clarity and completeness. There were no major changes made to the tools.

Reliability of the tools:
The internal consistency of the study tools was evaluated using Cronbach's alpha coefficients. Its result was 0.93 for tool I, 0.90 for tool II, 0.89 for tool III, and 0.87 for tool IV proved to be strong.

Operational design:
Procedures of data collection:

Preparatory phase:
In addition to a theoretical understanding of the research topic, the researchers studied a range of papers, books, journals, periodicals, magazines, and recent related literature that helped produce the video for the patients' prehabilitation program and the study tools as well.

Ethical considerations:

During the research application, there was no risk to the study participants. The study complies with standard clinical research ethics guidelines. After outlining the nature and goal of the study, patients who were taking part had their written consent collected. Anonymity and secrecy were guaranteed. Subjects to research have the freedom to decline to participate and/or to leave the study at any moment and without cause. The privacy of study participants was taken into account when gathering data.

A pilot study:
To test the viability and clarity of the research design, a pilot study including 10 patients, or 10% of the entire sample, was conducted; no modifications were made. The study includes patients who participated in the pilot research.

Fieldwork:

- Data was gathered from June 2021 to December 2021, a period of six months. Researchers twice a week, from 9 a.m. to 1 p.m. gathered data at the previously mentioned setting.
- The four phases of the study's implementation involved assessment, planning, implementation, and evaluation.

Assessment phase:

In this part, the researcher reviewed the current, past, local, and international related literature from various aspects using books, articles, periodicals, and magazines. The proposed study settings were assessed for several patients undergoing coronary artery bypass graft surgery. During this phase, tools for data collection were prepared. Before gathering the data, the researchers informed the

patients about the purpose and anticipated results of the research and obtained their agreement for their voluntary involvement. The tools were filled by interviewing the study subjects. The average time required for the completion of tools was around 45-50 minutes. The researchers filled the patients' demographic and medical data once preoperatively through tools I part 1 & 2. The data collection tools (tool I part 3, tool II, tool III, and tool IV) were filled twice; pre-test and post-test to assess and compare their general health, knowledge, practice level, physical activity, and functional capacity before implementation of the VAPP and after implementation.

II Planning phase:

Following a review of the literature and an assessment of the patients' actual needs, the researchers produced the video.

Video evaluation:

Two experts from the medical field of the Heart Academy-El-Demerdash Hospital, two from the department of medical-surgical nursing, and one from critical care nursing— evaluated the videos. The field's research professionals examined the video and materials of CABG to guarantee appropriateness and clarity.

The general objective of the video-assisted prehabilitation program was to improve patient outcomes, knowledge, and practice levels regarding coronary artery bypass grafting (CABG)**.**

Specific objectives: At the end of the video-assisted prehabilitation program (VAPP), the studied patients were able to:

- Know the introduction about CABG.
- Define CABG.
- List indications for CABG.
- Enumerate the risks of CABG surgery.
- Know pre-operative examinations, patients' preparation before surgery, patients' preparation during surgery, and patients' preparation after surgery.
- List the complications and how to avoid them following CABG surgery.
- Know healthy sleep, walking, and eating habits post-surgery.
- Perform exercises that must be done pre- and post-surgery to improve respiratory functions.
- Identify wound care, Leg clot prevention tips, and wear compression stockings.
- Know how to check their legs every day for redness, irritations, or other skin issues.

III. Implementation Phase:

There were three stages to the implementation phase: the pretest and booklet application came first, followed by the segment with video in the second stage and the posttest application in the third. Every academic and practical session of the video courses lasted between 40-50 minutes, twice a week. The theoretical video sessions were at 11:00 AM to 12.00 PM. The information covered in the theoretical video session included information about the introduction and meaning of coronary

artery bypass graft surgery, indications for coronary artery bypass graft surgery, risks of coronary artery bypass surgery, pre-operative examinations, patients' preparation before surgery, patients' preparation during surgery, patients' preparation after surgery, complications and how to avoid them following coronary artery bypass graft surgery such as (bleeding, infection, reactions to anesthesia, damage to tissues in the heart, kidneys, liver, and lungs, and stroke), sleep, walking, and eating habits post-surgery.

The practical sessions were at 12:00 PM to 1:00 PM. The exercises that were covered in the practical video sessions included exercises that must be done pre- and post-surgery to improve respiratory functions such as the use of a spirometer, coughing exercises, the correct way to cough after surgery, Wound care, Leg clot prevention tips, and wearing compression stockings in the morning when legs are usually least swollen, the correct way for wearing stockings every day “smooth the compression stocking and pull it on so that there are no bunches or kinks. Also, check that the seams of the stocking run straight up the legs”, and instruction to check legs every day for redness, irritations, or other skin issues. The videos were introduced to the patients using the researchers' laptops.

Throughout the theoretical and practical sessions, every component of the video-assisted prehabilitation program was demonstrated first and then re-demonstrated briefly at the end of the sessions. Sessions included some visual aids and were conducted in Arabic to ensure that each study topic was comprehended.

III. Evaluation phase:

Patients' outcomes were reassessed “their general health, knowledge, and practice level regarding coronary artery bypass graft surgery, physical activity and functional capacity after one month using the same tools used in the pretest (tool I part 3, tool II, III, and IV).

III. Administrative Design:

A letter was issued from the Faculty of Nursing, Ain Shams University to the head of the Heart Academy-El-Demerdash Hospital, explaining the purpose of the study and requesting their permission to collect the data.

IV. Statistical design:

Data entry was performed using SPSS for Windows, version 18. Data were presented by using descriptive statistics in the form of frequencies and percentages for quantitative variables and mean and SDs for qualitative variables. Differences between two means (t-test) were used. A Chi-square (X2) test of significance was used, and statistical significance was considered when P-value <0.05.

Results

Table (1) Clarified that less than one-half of the studied patients (46.0%) their age ranged from 50 to less than 60 yrs. old. the majority of the studied patients (89%) were male. Concerning educational level (46.0%) of the studied patients were read and written. More than two-fifths of the studied patients (41.0%) worked as office workers.

Table (2) Shows that approximately three-quarters of the studied patients were Smoking (73.0%). Regarding co-morbidities, hypertension was among 38%, Diabetes (42%), impaired liver function (18%), and obstructive pulmonary disease (2%).

Figure (1) reveals that all (100%) of the studied patients had not attended previous training sessions regarding CABG surgery.

Figure (2) reveals that (29%) of the studied patient's source of information was from previous experience followed by doctors (26%) regarding coronary artery bypass graft surgery.

Table (3) Clarifies the general health pre- and post-video-assisted prehabilitation program (VAPP) implementation, there was a statistically significant difference regarding the general health of Physical function, pain, Physical performance, and Validity of pre-and post-VAPP among the studied patients.

Table (4) reveals that there were statistically significant differences for all items of knowledge regarding CABG surgery between pre-and post-VAPP implementation at ($p<0.001$**).

Figure (3) Portrays that there was an improvement in the patient's total knowledge level regarding coronary artery bypass graft surgery. Where 9% of the studied patients had a satisfactory total knowledge level pre-VAPP implementation which became 90% post-implementation.

Table (5) shows that there was an improvement in the patient's practices after the VAPP implementation with statistically significant differences between all practice scores of the investigated patients' post-video-assisted prehabilitation program implementation than pre-video-assisted prehabilitation program implementation at ($p<0.001$**).

Figure (4) Portrays that there was an improvement in the patient's total practice level regarding coronary artery bypass graft surgery. Where 15% of the studied patients had adequate total practice level pre-video-assisted prehabilitation program (VAPP) implementation which became 80% post-implementation.

Table (6) Shows that there was a highly statistically significant difference between the studied patients regarding the level of dyspnea during the 6-minute walking test post-VAPP implementation and pre-VAPP implementation.

Table (7): Shows that there was a highly statistically significant difference between the studied patients regarding Borg rating of perceived exertion scale post-VAPP implementation and pre-VAPP implementation.

From Table (8) it was noticed that there was a positive highly significant correlation was detected between the studied patients' total knowledge, total practices, and their demographic data.

From Table (9) it was noticed that there was a positive highly significant correlation was detected between the total knowledge and the total practices post-video-assisted prehabilitation program implementation.

Table (1): Demographic data among the studied patients (n=100)

Variables	The sample	
	N	%
Age		
30 –<40 years	0	0.0
40 – <50 years	20	20.0
50 –< 60 years	**46**	**46.0**
60 –< 65 years	36	36.0
Gender		
Male	**89**	**89.0**
Female	21	21.0
Education level		
Illiterate	40	40.0
Read and write	**46**	**46.0**
Secondary education	**4**	**4.0**
University education	10	10.0
Occupation		
Office work	**41**	**41.0**
Farmer	14	14.0
Machinery work	8	8.0
Housewife	13	13.0
Not working	24	24.0

Table (2): Medical data among the studied patients (n=100)

Variables	N	%
Smoking		
Yes	**73**	**73.0**
No	27	27.0
Co-morbidities		
Hypertension	38	38.0
Diabetes	42	42.0
Impaired liver function	18	18.0

Obstructive pulmonary disease	2	2.0

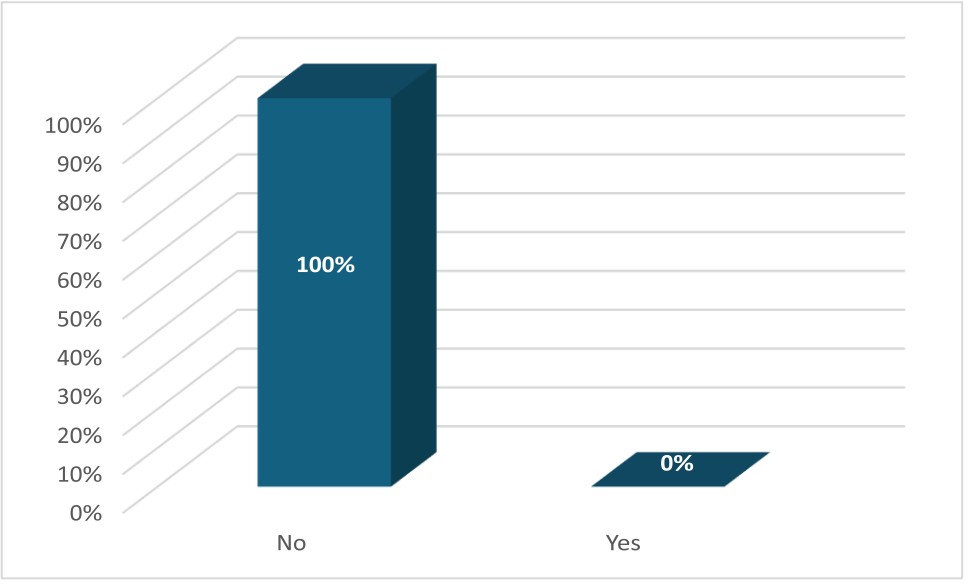

Figure 1: Distribution of patients based on history of attendance training sessions regarding CABG (n=100)

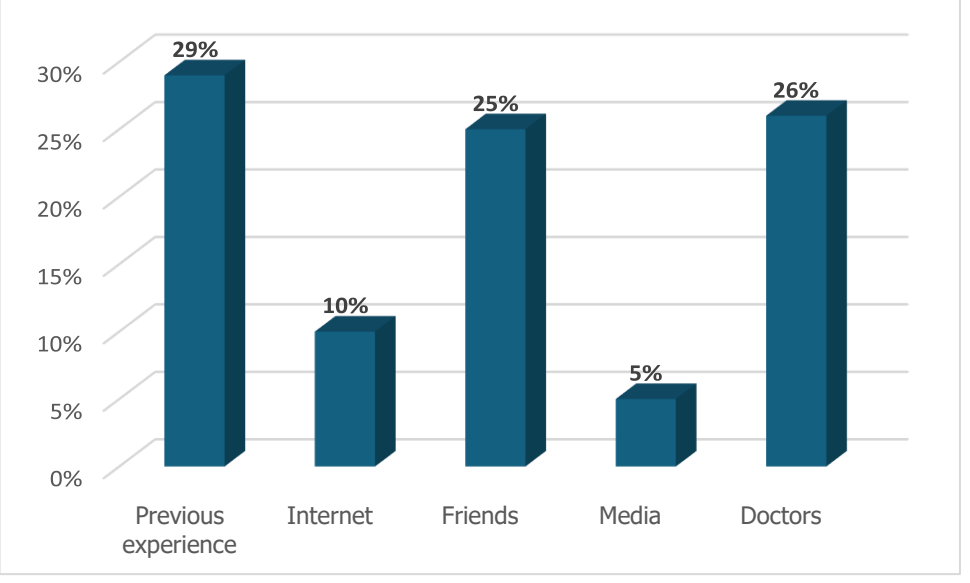

Figure (2): Sources of information among the studied patients regarding coronary artery bypass graft surgery among the studied patients (n=100)

Table (3): Comparison between general health pre- and post-VAPP among studied patients (n=100)

Variables	Pre-video-assisted prehabilitation program		Post-video-assisted prehabilitation program		*X2*	P-value
	N	%	N	%		
Physical function					50.33	.000
Dependent on self	6	6.0	100	100.0		
Independent on self	94	94.0	0	0.0		
Pain					24.44	.000
Moderate pain	36	36.0	95	95.0		
Severe pain	64	64.0	5	5.0		
Physical performance					28.55	.000
Light	65	65.0	8	8.0		
Moderate	35	35.0	42	42.0		
Heavy	0	0.0	50	50.0		
Validity					37.22	.000
Energy	25	25.0	97	97.0		
Heavy	75	75.0	3	3.0		

Table (4): The studied patients' knowledge distribution regarding coronary artery bypass graft surgery pre- and post-VAPP program implementation (n=100)

Patients' knowledge	Pre-video-assisted prehabilitation program implementation		Post-video-assisted prehabilitation program implementation		*X2*	P-value
	No	%	No	%		
Introduction to coronary artery bypass graft surgery	30	30.0	100	100.0	63.23	<0.001*
Definition of coronary artery bypass graft surgery	20	20.0	86	86.0		
Indications of coronary artery bypass graft surgery	22	22.0	98	98.0		
Risks of coronary artery bypass graft surgery	24	24.0	94	94.0		
Pre-operative examinations of coronary artery bypass graft surgery	18	18.0	77	77.0		
Patient's preparation pre-, during, and postcoronary artery bypass graft surgery	25	25.0	88	88.0		
Complications of coronary artery bypass graft surgery	19	19.0	90	90.0		
Sleep	28	28.0	91	91.0		

Walking	27	27.0	89	89.0		
Eating habits post-surgery	17	17.0	85	85.0		

*Highly significant at 0.001 levels

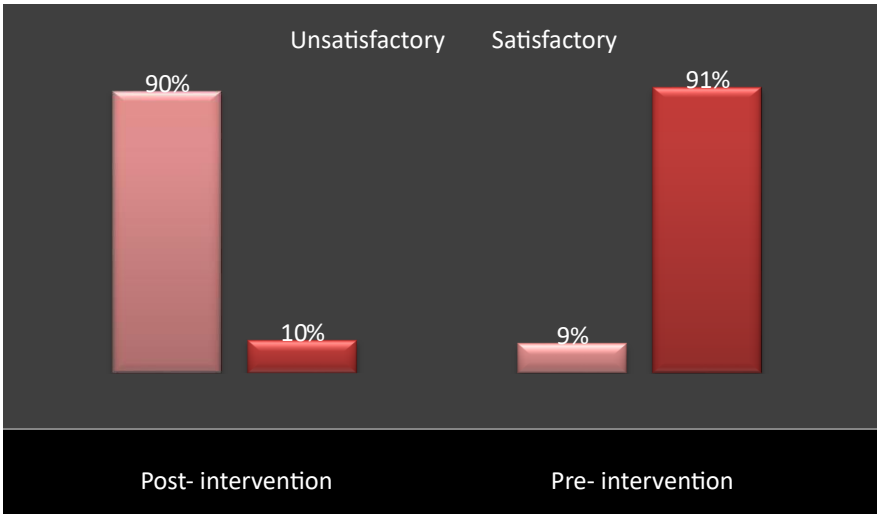

Figure (3): Patients' total knowledge level regarding coronary artery bypass graft surgery pre- and post-video-assisted prehabilitation program implementation (n=100)

Table (5): The studied patients' practice distribution regarding CABG surgery pre- and post-VAPP implementation (n=100)

Practice Items	Pre-video-assisted prehabilitation program implementation		Post-video-assisted prehabilitation program implementation		*X 2*	P-value
	No	%	No	%		
Exercises that must be done pre- and post-surgery	14	14%	88	88%	63.23	0.000**
Wound care	9	9%	79	79%		
Leg clot prevention tips	7	7%	78	78%		
Check legs every day for redness, irritations, or other skin issues	6	6%	80	80%		

**Highly statistically significant at P value <0.001.

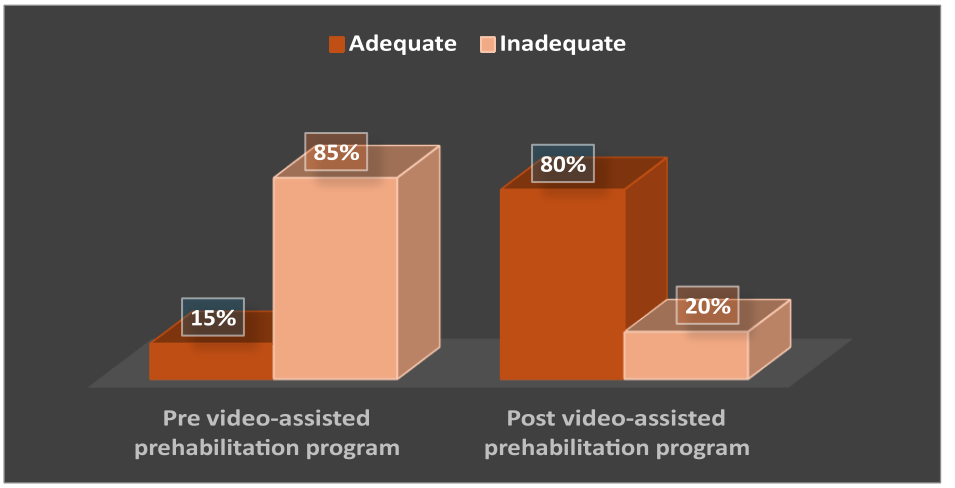

Figure (4): Patients' total practice level regarding coronary artery bypass graft surgery pre- and post-video-assisted prehabilitation program implementation (n=100).

Table (6): Comparison between the level of dyspnea during the 6-minute walking test of the studied patients' pre- and post-VAPP implementation (n=100)

Items	Pre-video-assisted prehabilitation program implementation		Post-video-assisted prehabilitation program implementation		*X2*	P-value
	No	%	No	%		
Nothing at all dyspnea	5	5.0	77	32.0	23.28	0.000**
Very, very slight dyspnea	15	15.0	86	36.0		
Slight dyspnea	28	28.0	80	22.0		
Moderate dyspnea	30	30.0	83	10.0		
somewhat severe dyspnea	12	12.0	0	0.0		
sever dyspnea	10	10.0	0	0.0		

***=highly significance*p≤0.01*

Table (7): Comparison between Borg rating of perceived exertion of the studied patients pre- and post-VAPP implementation (n=100)

Items	Pre-video-assisted prehabilitation program implementation		Post-video-assisted prehabilitation program implementation		*X2*	P-value
	No	%	No	%		
Level of exertion					39.48	.000**
Extremely light	0	0.0	35	35.0		
Very light	10	10.0	38	38.0		

Light	0	0.0	22	22.0		
Sometimes what hard	38	38.0	5	5.0		
Hard	25	25.0	0	0.0		
Very hard	27	27.0	0	0.0		

***=Highly significance*p≤0.01*

Table 8: Correlation between studied patients' knowledge and practices regarding coronary artery bypass graft surgery and their demographic data (n=100)

Patients' data	Patients' knowledge		Patients' practices	
	R	P-value	R	P-value
Age	0.569	0.014*	0.633	0.012*
Education	0.436	0.001*	0.546	0.015*
Occupation	0.425	0.014*	0.648	0.014*

* P-value <0.05 ---------- statistically significant

Table (9): Correlation coefficient between the studied patients' knowledge and their practices regarding coronary artery bypass graft surgery pre- and post-VAPP implementation (n=100)

Items	Practice			
	Pre-video-assisted prehabilitation program implementation		Post-video-assisted prehabilitation program implementation	
	R	P	R	P
- Total knowledge of pre-video-assisted prehabilitation program	0.034	0.822 (N.S)	---	---
- Total knowledge of post-video-assisted prehabilitation program	---	---	0.245	0.005*

** Correlation is significant at the 0.01 level

Discussion

Prehabilitation makes patients more physically ready for surgery, reduces complications following the procedure and the duration of hospital stay, and makes it easier for patients to transition from the hospital to the community. All of these benefits help patients withstand the stress of surgery. Despite the paucity of evidence, cardiac prehabilitation ought to include social support, anxiety reduction, training activity, nutrition optimization, and education (Pokhrel & Mellor, 2021). Numerous research findings demonstrate the effectiveness of cardiac rehabilitation following CABG surgery in terms of improving quality of life, lowering mortality, and increasing exercise capacity (Galih& Martini., 2022).

Video modality is becoming more and more popular because of its unique characteristics that effectively capture the spirit of the nursing phenomena. Additionally, it is frequently used in nursing as an efficient teaching strategy since

it consistently provides multi-media, multisensory information about the subject and its surroundings (Balasubramanian et al., 2018).

Every patient under investigation, based on the current study, had not attended any prior cardiac artery bypass graft surgery training sessions. Researchers found that for patients to be able to act critically and quickly in situations where their lives are in danger, they need to possess specific knowledge and abilities. This outcome explains the reason for the patients' knowledge gap and also highlights their demand for program implementations.

In terms of general health, there was a statistically significant difference in the patient's physical function, pain, physical performance, and validity before and after the video-assisted prehabilitation program. This result corroborated the findings of Nafady et al. (2019), who highlighted the importance of early rehabilitation and mobilization by physiotherapists for patients, as well as the demonstration of deep breathing, coughing, and walking exercises before the operation, to guarantee adequate oxygenation, monitor mucus secretion, prevent respiratory tract infections, and enhance physical functioning and endurance. Early rehabilitation helps prevent all of these problems in the future. According to the researcher, the patient's length of hospital stay was decreased with the assistance of rehabilitation, hence lowering the patient's risk of developing hospital infections.

The present study's findings regarding patients' knowledge of CABG surgery showed that, following the implementation of a video-assisted prehabilitation program, there were improvements in all knowledge scores of the patients under investigation compared to before the program's implementation. These differences were statistically significant. According to the researchers, this outcome illustrates the beneficial impact of the program implementations, which satisfy the requirements of the patients under study and give them the knowledge they need to preserve their health.

The majority of patients had an inadequate understanding of CABG surgery before the commencement of the VAPP, according to the study's findings. These results highlight the importance of training. Additionally, it demonstrated how well the program had improved the patients' understanding. This result is corroborated by Subin, (2017) study, "Assessing the effect of video-assisted teaching on knowledge regarding arterial blood gas analysis and interpretation among nurses working in selected hospitals in Bhopal," which found that the knowledge levels of the selected sample differed significantly before and after the teaching intervention.

In a similar vein, Manju & Prasad (2013) found that video-assisted teaching modules were a more successful teaching strategy when comparing the effectiveness of lecture cum demonstration versus video-assisted teaching bag technique to second-year BSc nursing students in a chosen nursing colleague at Mangalore.

The results of this study showed that there were statistically significant differences in all practice scores of the patients analyzed before and after the implementation of the VAPP compared to before the program's implementation. According to the

researchers, this demonstrated that patients' practices improved when video-assisted prehabilitation programs were implemented.

In terms of the patients' total practice before and after the video-assisted prehabilitation program intervention, the findings showed that most of them had lower levels of practice before the program than they did after the program was implemented. According to the researchers, this demonstrates the benefits of using the video-assisted prehabilitation program. Since professional skills get outdated quickly as a result of video-assisted training interventions, this discovery might be the result of relevant scientific and technological advancements. As such, a thorough foundational professional training program is no longer adequate for patients' practices. According to Gijs et al. (2022), educational films and video consultations can help patients recover more quickly and need less unscheduled medical care in patients following CABG surgery.

The results showed that there was a highly statistically significant difference in physical activity and functional capacity between the study participants after the video-assisted prehabilitation program was implemented than before implementation. According to the researchers, this showed how effectively the VAPP was put into practice.

These results are consistent with those of Steinmetz et al. (2020), who reported those patients' six-minute walk distances following surgery showed a significant improvement based on postoperative exercise, which was based on cardiac rehabilitation. This conclusion is corroborated by Dharmapriya et al. (2019), who reported that both the obese and non-obese groups showed improvement on the 6-minute walk test following cardiac rehabilitation.

The findings demonstrated a highly statistically significant difference between the study's Borg rating of perceived exertion scale before and after the implementation of the VAPP, concerning physical activity and functional capacity (Borg rating of perceived exertion). This result was consistent with that of Nagm Eldean, et al. (2019), who discovered that there was a considerably higher perceived exertion level during the identical resistance exercise. Dharmapriya et al. (2019) found improvement on the Borg scale following cardiac rehabilitation in both obese and non-obese groups, which supports this finding.

Regarding the relationships between practice, amount of knowledge, and demographic data, the current study found a substantial statistical relation between the patients' pre-and post-implementation of the video-assisted prehabilitation program regarding patients' demographic data and their total knowledge and practices. In terms of patient age, older patients and those with higher educational attainment were shown to have superior knowledge and practices than younger patients; these results were contrary to previous studies suggesting that these criteria had little bearing on knowledge and practice (Masmouh et al., 2015 and Corrigan et al., 2018).

According to these findings, there was a favorable and potential correlation between overall knowledge and practices following the implementation of the VAPP. This demonstrates, in the opinion of the researchers, how well the VAPP was carried out. This proved how important it is to understand the VAPP's implementation goal, which

is to improve knowledge connected to best practices. This outcome was in line with studies by Safwat & Khorais (2018), who discovered a significant positive correlation between post-program knowledge and practices among nurses. Based on the authors, this suggested that the patients under investigation had made remarkable improvements since the VAPP was implemented.

Conclusion

Based on the current study's findings and hypotheses, the current study concluded that video-assisted prehabilitation program implementation has a positive effect on improving patient outcomes undergoing coronary artery bypass grafting. Also, there is an improvement in the knowledge and practice level of patients which indicates that the video-assisted prehabilitation program is effective.

Recommendations

In light of these findings, the following recommendations are suggested:

- Video-assisted prehabilitation program implementation should be taught to patients undergoing coronary artery bypass grafting to improve their outcomes.

- Prehabilitation booklets and illustrated pamphlets should be given to patients in the form of videos to be more effective.

- Further research similar to ours with the inclusion of a larger sample and another setting for generalization.

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