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A Study to Assess the Effectiveness of Planned Teaching on Knowledge and Practice regarding Use of Incentive Spirometry in Post Operative Patients Undergoing Cardiac Surgery in Apollo Hospitals, Visakhapatnam

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Abstract: ***Background: Postoperative pulmonary complications (PPCs) are common occurrences after major cardiac, thoracic, and abdominal surgeries because effects from the surgical procedures, anesthesia, and pain can impede chest wall mobility and lung expansion. The main aim of post - operative care is to prevent complications, i. e., atelectasis and infection. Incentive spirometry is also called sustained maximal inspiration (SMI) and is considered bronchial hygiene therapy. This is mainly designed to function as a natural yawn, including long, slow, deep breaths. Incentive spirometry is done by using a device that provides patients with visual and positive feedback when they inhale at a predetermined volume, and inflation should last for a minimum of 3 seconds. Materials and Methods: A pre - experimental research design was adopted to find out the knowledge of postoperative patients undergoing cardiac surgery regarding the use of incentive spirometry at Apollo Hospitals, Visakhapatnam. A total of 60 postoperative patients were selected using the convenience sampling technique. Data were collected by using a pre - tested knowledge questionnaire and practice checklist. A pre - test was conducted for 60 respondents using a knowledge questionnaire and practice checklist regarding the use of incentive spirometry. After the completion of the pre - test, the respondents were trained regarding the use of incentive spirometry, and a post test was conducted. The data was analyzed using descriptive and inferential statistics. Results: The planned teaching was found to be effective in increasing the knowledge and practice of the postoperative patients regarding incentive spirometry, as the calculated "t" values for knowledge (13.01) and practice (10.8) are greater than the table values (2.66) at the 0.05 level of significance. There was a significant association between the knowledge of the postoperative patients and the demographic variables such as age, gender, educational qualification, and source of information at the 0.05 level of significance. Conclusion: The study revealed that incentive spirometry is more effective in improving lung capacity among post - operative patients undergoing cardiac surgery, which further improves blood circulation and hastens the early recovery of surgical wounds. This incentive spirometry plays a vital role in postoperative care. All nurses who are involved in postoperative units should encourage and educate the patients to do it on a regular basis.***

Keywords: effectiveness, knowledge, practice, incentive spirometry, postoperative patients, cardiac surgery

1. Introduction

Post - operative recovery is an extremely essential part of being in a state of complete wellness. Post - operative recovery can be completed by returning patients to normal health at a level of independence, i. e., daily living. This can neutralize postoperative patients as early as possible.1According to studies, the incidence of postoperative complications after hospital discharge was 61%. Postoperative pulmonary complications are reported within the range of 2–39 and include atelectasis, pneumonia, and respiratory failure.[3, 4] Post - operative care is the care of patients after any surgery. The main aim of post - operative care is to prevent complications, i. e., atelectasis and infection. The main goal of the study was to identify the effect of incentive spirometry on postoperative patients' recovery. Incentive spirometry is intended to mimic natural sighing or yawning by encouraging the patient to take long, slow, deep breaths. This decreases pleural pressure, promoting increased lung expansion and better gas exchange. When the procedure is repeated on a regular basis, atelectasis may be averted or reversed.[5, 6]

2. Material and Methods

A pre - experimental study was conducted at Apollo Hospitals in Visakhapatnam to assess the effectiveness of planned teaching on knowledge and practice regarding the use of incentives in postoperative cardiac surgery patients.

Study Design: A pre - experimental study with a one - group pretest and posttest design

Study Location: Apollo Hospitals, Visakhapatnam

Study duration: 3 months

Sample size: 60 postoperative patients undergoing cardiac surgery.

Sample size calculation: The target population from which a selected sample was drawn using convenience sampling was 60. We assumed that the confidence interval was 10% and the confidence level was 95%.

Subjects and method of selection: The study population was drawn from patients admitted to the cardiac ward and CICU at Apollo hospitals in Visakhapatnam using a convenience sampling technique.

Inclusion criteria: the study includes postoperative patients who underwent cardiac surgery at Apollo hospitals in Visakhapatnam.

- Willing to participate in the study.
- Willing to give consent for the study
- Able to write and read Telugu and English
- At the time of data collection, it was available.

Exclusion criteria: -

- Not willing to participate in the study
- Not available at the time of data collection.

Procedure methodology

Formal permission was obtained from the concerned authorities at Apollo Hospitals, Visakhapatnam. The purpose of the study was explained to them, and consent was obtained from the postoperative patients undergoing cardiac surgery.

A pre - test was conducted for 60 respondents using a knowledge questionnaire and practice checklist regarding the use of incentive spirometry. After the completion of the pre - test, the respondents were trained regarding the use of incentive spirometry. All the questions and queries that the subjects had were clarified. A post - test was conducted after the training intervention. After the post - test, the researcher thanked and appreciated all the subjects for their goodwill.

Statistical analysis

The data were analyzed using descriptive and inferential statistics based on the objectives and hypothesis of the study.

3. Results

After collecting post - test data, it was analyzed using descriptive and inferential statistics. The below figures describe the frequency and percentage distribution of socio demographic variables among postoperative patients undergoing cardiac surgery, whose knowledge and practice were assessed regarding the use of incentive spirometry. Out of 60 postoperative cardiac surgery patients, 27 (45%) were between the ages of 41 and 50, 23 (38.3%) were between the ages of 51 and 100, 8 (13.3%) were between the ages of 31 and 40, and 2 (3.3%) were between the ages of 20 and 30.

It is observed that out of 60 postoperative patients undergoing cardiac surgery, 44 (73.4%) were males and 16 (26.6%) were females. In relation to educational qualifications, 24 (40%) were intermediate or graduate, 17 (28.4%) were secondary school, and 13 (21.6%) were primary school. and 6 (10%) were post - graduate or above. The above table reveals, regarding source information, that out of 60 postoperative patients undergoing cardiac surgery, 46 (76.6%) got information from hospitals, 6 (10%) from pamphlets, 4 (6.7%) from social media, and 4 (7.6%) from newspapers.

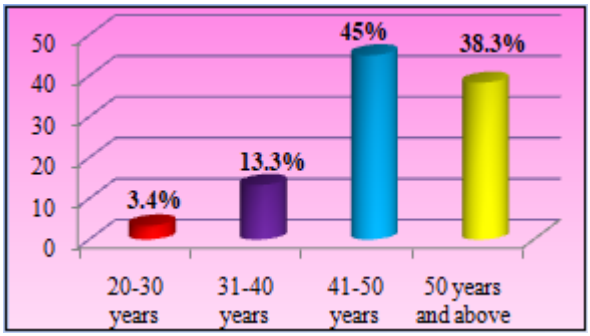

Figure 1: Percentage distribution of Post Operative Patients Undergoing Cardiac Surgery according to age

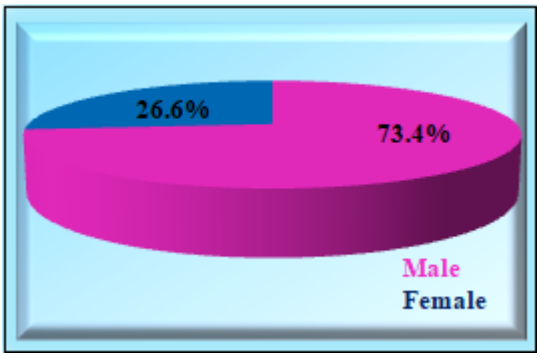

Figure 2: Percentage distribution of Post Operative Patients Undergoing Cardiac Surgery according to Gender

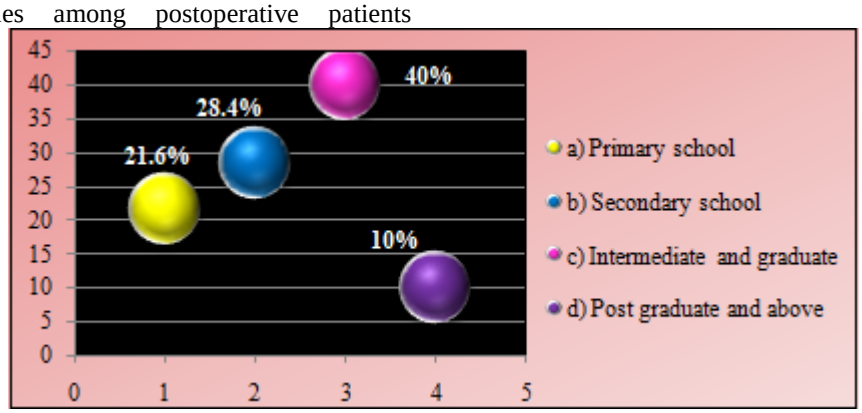

Figure 3: Percentage distribution of Post Operative Patients Undergoing Cardiac Surgery according to Educational qualification

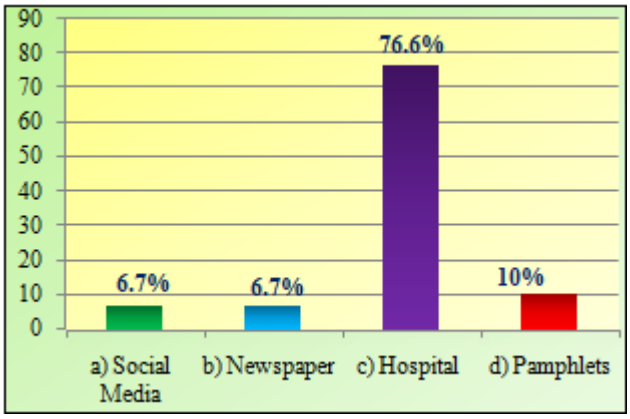

Figure 4: Percentage distribution of Post Operative Patients Undergoing Cardiac Surgery according to Source of information

Table 1: Frequency and percentage distribution of pre - test and post - test level of knowledge and practice scores regarding use of incentive spirometry In Post Operative Patients Undergoing Cardiac Surgery

Variable	Level of knowledge	Score	Pre - test		Post - test	
			(f)	%	(f)	%
Knowledge	Poor knowledge (≤50%)	0 - 4	56	93.4	0	0
	Average knowledge (51 - 60%)	5 - 6	4	6.6	27	45
	Good knowledge (≥70%)	7 - 10	0	0	33	55
Practice	Poor practice (≤50%)	0 - 4	57	95	0	0
	Fair practice (51 - 60%)	5 - 6	3	5	21	35
	Good practice (≥70%)	7 - 10	0	0	39	65

Table - 1 shows that the poor knowledge rate of postoperative patients undergoing cardiac surgery on the use of incentive spirometry was 56 (93.4%) in the pre - test, while there was no poor knowledge in the post - test. The pre - test score for postoperative patients undergoing cardiac surgery on the use of incentive spirometry was 6.7%, while the post - test score was 45%. The percentage of postoperative patients undergoing cardiac surgery who had good knowledge of the use of incentive spirometry was 0% in the pre - test and 53% in the post - test.

In terms of poor practice among postoperative cardiac surgery patients, the use of incentive spirometry was 57% in the pre - test and there was no poor practice in the post - test. The above table describes the fair practice of postoperative cardiac surgery patients using incentive spirometry, which was 3 (5%) in the pre - test and 21 (35%) in the post - test. According to the above table, the good practice rate of postoperative patients undergoing cardiac surgery on incentive spirometry was 0% in the pre - test and 35% (65%) in the post - test.

Table 2: Mean, standard deviation and paired‘t’ test for knowledge and practice scores regarding use of incentive spirometry in Post Operative Patients Undergoing Cardiac Surgery

Variable	Test	f	Maximum score	Mean	SD	paired ‘t’ test	Table value
Knowledge	Pre - test	60	10	2.6	1.2	13.01*	2.66*
	Post - test			7.8	2.01		
Practice	Pre - test	60	10	2.4	1.25	10.8*	2.66*
	Post - test			8.25	2.07		

Table - 2 shows that the pre - test knowledge scores have a mean value of 2.6± 1.2, while the post - test knowledge scores have a mean value of 7.8 ± 2.01. From the above table, it is evident that structured teaching is effective in improving the knowledge of postoperative patients undergoing cardiac surgery on the use of incentive spirometry, as the calculated‘t’ value (13.0*) is higher than the table value (2.66*) at the 0.05 level of significance. Hence, the H_1 hypothesis was accepted and the null hypothesis was rejected.

Table 2 shows that the mean value of the pre - test practice scores was 2.4±1.25, while the mean value of the post - test practice scores was 8.25 ±2.07. From the above table, it is evident that a structured teaching programme was effective in improving the practice of postoperative patients undergoing cardiac surgery on the basis of incentive spirometry, as the calculated ‘t’ value (10.8*) was higher than the table value (2.66*) at the 0.05 level of significance. Hence, the H_1 hypothesis was accepted and the null hypothesis was rejected.

Table 3: Association between pre - test knowledge scores of use of incentive spirometry in Post Operative Patients Undergoing Cardiac Surgery with their selected demographic variables

S. no	Selected demographic variables	Level of knowledge		Chi - square value	Table value P<0.05
		Poor knowledge	Average knowledge		
1	1. Age in years?				
	a) 20 - 30 years	1	1	8.13*	7.82
	b) 31 - 40 years	7	1		
	c) 41 - 50 years	25	2		
	d) 51 years and above	23	0		
2	Gender				

	a) Male	43	1	5.11*	3.84
	b) Female	13	1		
3	Educational qualification?				
	a) Primary school	13	0	8.04*	7.82
	b) Secondary school	16	1		
	c) Intermediate and graduate	23	1		
	d) Post graduate and above	4	2		
4	Source of information?				
	a) Social Media	3	1	10.7*	7.82
	b) Newspaper	4	0		
	c) Hospital	45	1		
	d) Pamphlets	4	2		

Table - 3 presents the association of the pre - test knowledge of postoperative patients undergoing cardiac surgery on the use of incentive spirometry with their selected demographic variables. The chi square test was carried out to find out the association between the pre - test results of postoperative patients undergoing cardiac surgery on use of incentive spirometry with their selected demographic variables like age, gender, educational level, and source of information. The calculated values of socio - demographic variables of post - operative cardiac surgery patients using incentive spirometry, such as age (8.13*), gender (5.11*), educational qualification (8.04*), and source of information (10.7*), are greater than the table value and thus found to be significantly associated with pre - test knowledge of post - operative cardiac surgery patients using of incentive spirometry at the 0.05 level of significance. Regarding gender, the calculated value is non - significant. Hence, the researcher accepted the H_2 hypothesis and rejected the null hypothesis. Therefore, it is evident that the pre - test knowledge of post - operative patients undergoing cardiac the use of incentive spirometry was influenced by their age, gender, educational level, and source of information.

4. Discussion

The aim of the study was to assess the knowledge and practice of postoperative patients undergoing cardiac surgery on the use of incentive spirometry at Apollo hospitals in Visakhapatnam. A pre - experimental research design with one group pre - test was used to evaluate the effectiveness of structured teaching regarding the use of incentive spirometry.

A total of 60 postoperative patients undergoing cardiac surgery were selected using the convenience sampling technique. A structured knowledge questionnaire was used to collect the data from the subjects. After explaining the purpose of the study to post - operative patients undergoing cardiac surgery, a pre - test was administered. A structured teaching session was conducted simultaneously after the completion of the pre - test on the first day. A post - post - test was conducted. After post - test data analysis was done using descriptive and inferential statistics.

In the pre - test, knowledge scores had a mean value 2.6±1.2 while in the post - test, knowledge scores had a mean value 7.8±2.01 and it was evident that structured teaching was effective in improving the knowledge of post operative patients undergoing cardiac surgery, as the calculated 't' value (13.01*) was higher than the table value (2.66*) at the 0.05 level of significance.

In pre - test practice scores had a mean value 2.4±1.5 while in post - test practice, scores had a mean value 8.25±2.07 and it was evident that structured teaching was effective in improving the practice of postoperative patients undergoing cardiac surgery, as the calculated 't' value (10.8*) was higher than the table value (2.66*) at the 0.05 level of significance.

The calculated values of the socio - demographic variables of postoperative patients undergoing cardiac surgery, such as age (8.13*), gender (5.11*), educational level (8.04*), and source of information (10.7*), are greater than the table value and thus found to be significantly associated with pre - test knowledge of postoperative patients undergoing cardiac surgery at the 0.05 level of significance. The current study's findings on the association of knowledge of postoperative patients undergoing cardiac surgery with demographic variables such as age and gender are consistent with the findings of the study on the Effect of Incentive Spirometry on Recovery of Post - Operative Patients: A Pre - Experimental Study6 by (2020) Akashdeep Batra1, C. Vasantha Kalyani, and Kusum K (2020 j).

5. Conclusion

Incentive spirometry is also called as sustained maximal inspiration (SMI) and is considered bronchial hygiene therapy. This is mainly designed to function as a natural yawning including long, slow, deep breaths.

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