

Effectiveness of Perioperative Patient Education Program on Knowledge and Satisfaction among Patients Undergoing Total Joint Arthroplasty

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ABSTRACT

Total hip arthroplasty (THA) or total knee arthroplasty (TKA) is a major surgical procedure that can provoke physical as well as psychological stress in patients. It is hypothesized that perioperative patient education helps patients to prepare better for surgery and enhance postoperative recovery.

Objective: To evaluate the effectiveness of perioperative patient education program on knowledge and satisfaction among patients undergoing total joint arthroplasty.

Materials and methods: A total of 100 patients undergoing THA or TKA were enrolled preoperatively and were randomized into control (50) and experiment groups (50) by covariate adaptive randomization. In the experimental group, along with routine care, perioperative education program was implemented. It included a patient information booklet, demonstration, and return demonstration of pre- and postoperative exercises and transfer techniques. The patients in the control group continued with routine care. Assessment of patient's knowledge regarding surgery and postoperative self-care was done preoperatively, before educational intervention, and at the time of discharge. Patient satisfaction with perioperative information was assessed at the time of discharge using a patient satisfaction scale.

Results: There was statistically no significant difference between the pre-intervention knowledge scores of both groups. However, there was a significant improvement in knowledge ($p < 0.001$) regarding surgery and postoperative self-care as well as satisfaction level ($p < 0.001$) in participants who underwent an education program than in the control group.

Conclusion: Educational booklet combined with exercise program was effective in enhancing patient knowledge and satisfaction. This program is recommended as routine care of patients undergoing total joint arthroplasty.

Keywords: Patient knowledge, Patient satisfaction, Perioperative education, Total joint arthroplasty.

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INTRODUCTION

Total joint arthroplasty, also known as total joint replacement, is one of the most successfully performed orthopedic procedures. TKA and THA are the most widely practiced surgical options for arthritis all over the world, and their application is rising in India.^{1,2}

Total joint replacement is a surgical procedure in which parts of an arthritic or damaged joint are removed and replaced with a metal, plastic, or ceramic device called a prosthesis. The prosthesis is designed to replicate the movement of a normal, healthy joint.³ The long-term goals of joint arthroplasty are to relieve pain, restore and improve limb function, and help patients to resume normal activities of daily living, thus improving the quality of life.⁴ Osteoarthritis is the most common underlying condition for both TKA and THA. Other conditions requiring TKA and THA include inflammatory arthritis, fracture, dysplasia, malignancy, and others.⁴

Even though it is a common operation, patients have little knowledge about the procedure in our country, most patients gain knowledge about these surgical procedures from media, and experiences of family or friends. These routes may provide inadequate information to patients and may lead them to have unrealistic expectations regarding postoperative functional recovery.

Despite the increase in surgeries, there is evidence that there is an unmet need in the population.^{5,6} Patients have identified gaps in information and education as one of their key concerns.^{7,8} Providing information that is tailored to patients' needs promotes informed

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decision-making.⁹ Timely information and education have been shown to have positive effects on outcomes and reduce the length of stay.^{10,11} Studies have shown that preoperative education reduces anxiety and improves satisfaction in patients just before surgery.¹²⁻¹⁴

Quality perioperative patient education not only improves postoperative patient outcomes but contributes as well to high patient satisfaction scores.¹⁵ By ensuring a full understanding of the surgery and postoperative routines and promoting physical recovery and psychological wellbeing through preparatory information, it is hypothesized that this perioperative education

program will help patients to better prepare for an upcoming surgery and motivate them to be active participants in the recovery process thus ultimately improving the patient satisfaction.

MATERIALS AND METHODS

Study Design and Setting

A prospective randomized control trial was conducted among 100 patients undergoing total joint arthroplasty and admitted to orthopedic units of PGIMER, Chandigarh.

Subjects and Methods

Sample and Sampling Technique

A total of 100 patients meeting the inclusion criteria were enrolled in the present research study. They were randomized to control (50) and experiment group (50) by covariate adaptive randomization. Patients were identified 1–4 days before the day of surgery. Routine care was provided to the study participants of the control group.

Method of Data Collection

In the experimental group, along with routine care, perioperative patient education program was implemented. It included verbal and written information about surgery, perioperative exercises, postoperative self-care, and discharge instructions. Practical sessions involved demonstration and return demonstration of perioperative exercises, ambulation techniques, and postoperative self-care techniques. Separate information booklets were provided for hip and knee replacement in English and Hindi font. Baseline assessment of patient knowledge regarding surgery and postoperative self-care was assessed using a questionnaire. The effectiveness of the patient education program was assessed using the patient knowledge questionnaire and patient satisfaction scale at the time of discharge.

Data Collection Tool and Content Validity of the Tool

An interviewing questionnaire was developed after reviewing the related literature. It consisted of three parts. The first part considered the sociodemographic and clinical profile of study participants. The second part consisted of 20 items regarding patient knowledge questionnaire to assess their knowledge regarding total joint arthroplasty, exercise and mobilization, and prevention of postoperative complications. For each right response, one point was given. Each item score was summed up to get the total knowledge score. The maximum attainable score was 20. The third part comprised a 10-item patient satisfaction scale to assess the satisfaction of the study participants with perioperative information. It was a five-point Likert scale that offered a range of answer options from very satisfied to very dissatisfied with a neutral midpoint. The content validity of the tools was established with the help of experts in the field of orthopedic surgery, medical-surgical nursing, and physiotherapy.

Ethical Consideration

Approval of research protocol was sought from the Institute Ethics Committee of PGIMER, Chandigarh. Permission was obtained from the head of the Department of Orthopedics. The study is registered under CTRI/2018/05/014240.

Data Analysis and Interpretation

The data so collected were entered in Microsoft Excel (2010) and Statistical Package for Social Sciences (SPSS Version 23). In descriptive statistics, frequency, percentage, mean-standard deviation (SD), and median range were used to describe the variables. In inferential statistics, Chi-square and *t*-test were used.

Table 1: Sociodemographic profile of the study participants

<i>N</i> = 100			
<i>Variables</i>	<i>Control group</i> (<i>n</i> ₁ = 50) <i>f</i> (%)	<i>Experimental group</i> (<i>n</i> ₂ = 50) <i>f</i> (%)	<i>χ</i> ² value (<i>df</i>) <i>p</i> -value
Age (in years)*			
18–40	14 (28)	13 (26)	0.38 (2) 0.82
41–60	22 (44)	25 (50)	
>60	14 (28)	12 (24)	
Gender			
Male	27 (54)	26 (52)	0.40 (1) 0.84
Female	23 (46)	24 (48)	
Qualification			
Illiterate	9 (18)	9 (18)	1.76 (3) 0.62
Primary	19 (38)	17 (34)	
Secondary	14 (28)	19 (38)	
Graduate and above	8 (16)	5 (10)	
Residence			
Rural	24 (48)	22 (44)	0.384 (2) 0.82
Semi-urban	18 (36)	21 (42)	
Urban	8 (16)	7 (14)	

* Age (mean ± SD, range) control group = 51.41 ± 14.98 (19–78); experiment group = 50.86 ± 15.75 (19–81)

RESULTS

Table 1 depicts the comparison of the sociodemographic profile of study participants undergoing total joint arthroplasty among control and experiment groups. Mean age \pm SD was comparable in control group (51.41 \pm 14.98) and experimental group (50.86 \pm 15.75). Nearly half of the participants, that is, 54% of the control group and 52% of the experimental group were males. In both groups, 72% of study participants were literate.

Table 2 depicts the comparison of clinical variables of study participants in both groups. Almost 52% of the control group and 60% of the experimental group were diagnosed with osteoarthritis. Comparing the comorbidities between the two groups shows that in the control group, 22% and 12% had hypertension and diabetes, respectively, whereas in the experimental group, 20% and 18% had hypertension and diabetes, respectively. Both groups were comparable in terms of surgical procedure done and type of implant used.

Tables 3 and 4 show the comparison of pre- and post-interventional knowledge regarding surgical procedure and postoperative self-care between the control and experiment groups. The knowledge was assessed regarding surgical procedure and its outcomes, positioning, diet, postoperative exercise, mobilization, and postoperative precautions. There was no significant difference in pre-interventional knowledge scores of both groups. But during post-intervention assessment significantly higher number of study participants in the experimental group gave the correct responses as compared to the control group.

Table 4 shows the comparison of pre- and post-interventional knowledge regarding prevention of postoperative complications between the control and experiment groups. During pre-intervention assessment, no significant difference in correct responses to each item was noted between both the groups except the knowledge regarding the benefit of wearing compression stocking, for which 24% in the experimental group and 44% in the control group gave the correct response. During post-interventional assessment of knowledge, significantly higher number of study participants in the experimental group gave the correct response compared to the control group to the questions regarding identification of signs of deep vein thrombosis (DVT) and infection, prevention of DVT, and swelling postoperatively.

Table 5 depicts the comparison of pre- and post-intervention knowledge regarding total joint arthroplasty between control and experimental groups. There was no statistically significant difference between pre-intervention knowledge scores of both the groups. However, post-intervention mean knowledge score in the experiment group was significantly higher in participants in the experimental group ($p < 0.001$).

Table 6 depicts the comparison of both groups based on their satisfaction with perioperative care and instructions assessed with a patient satisfaction scale (five-point Likert scale). The scale consists of 10 items assessing the core domains of patient satisfaction, which include satisfaction with an explanation of preoperative and postoperative information and teaching, pain control and mobilization protocol, dietary instructions, participation in medical decision-making, and satisfaction with overall hospital care and

Table 2: Clinical profile of study participants

Variables	N = 100		χ^2 value (df) p-value
	Control group ($n_1 = 50$) f (%)	Experimental group ($n_2 = 50$) f (%)	
Clinical diagnosis			
Osteoarthritis	26 (52)	30 (60)	4.91 (4) 0.282 [#]
Avascular necrosis	13 (26)	10 (20)	
Rheumatoid arthritis	6 (12)	6 (12)	
Fracture	4 (08)	2 (4)	
Ankylosing spondylitis	1 (02)	2 (4)	
Comorbidities			
Hypertension	11 (22)	10 (20)	0.51 (4) 0.276
Diabetes mellitus	6 (12)	9 (18)	
Cardiac disease	4 (08)	2 (04)	
Others*	2 (04)	4 (08)	
Surgical procedure			
Bilateral TKR	22 (44)	21 (42)	1.19 (2) 0.55
Unilateral THR	25 (50)	22 (44)	
Unilateral TKR	3 (6)	7 (14)	
Type of implant			
Cemented	30 (60)	33 (66)	0.17 (1) 0.68
Uncemented	20 (40)	17 (34)	
Type of anesthesia			
Spinal	45 (90)	49 (98)	0.275 (2) 0.20 [#]
General	5 (10)	1 (02)	

[#]Fisher exact; *Others: hypothyroidism, asthma

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Table 3: Comparison of knowledge regarding surgical procedure and postoperative self-care between control and experiment group participants N = 100

Sl. no.	Variables	Pre-intervention		χ^2 value (df) p-value	Post-intervention		χ^2 value (df) p-value
		Correct responses			Correct responses		
		Control group	Experiment group	Control group	Experiment group		
1	Osteoarthritis is the most common indication of hip or knee arthroplasty	13 (26)	15 (30)	0.19 (1) 0.65	21 (42)	37 (74)	10.51 (1) 0.001
2	Ability to do normal activities without pain is the common benefit of hip/knee replacement surgery	39 (78)	36 (72)	0.48 (1) 0.48	45 (90)	49 (98)	2.83 (1) 0.09
3	Prosthesis (artificial joint) can last for more than 20 years	15 (30)	20 (40)	1.09 (1) 0.29	24 (48)	42 (84)	14.43 (1) <0.001
4	Coughing/deep breathing, ankle pumps, and quadriceps muscle strengthening (thigh and buttock tightening) exercises are useful during recovery from replacement surgery?	15 (30)	20 (40)	1.09 (1) 0.29	30 (48)	45 (78)	12.01 (1) 0.001
5	Position recommended after surgery is lying flat on back with legs separated with pillow	23 (46)	26 (52)	0.36 (1) 0.54	38 (66)	46 (52)	3.84 (1) 0.05
6	Diet recommended after surgery is high protein, calcium rich, and food rich in iron and vitamin C	19 (38)	21 (42)	0.16 (1) 0.68	24 (48)	39 (78)	9.6 (1) 0.002
7	Rehabilitation after surgery (able to walk with or without walking aid independently takes 1–3 months)	21 (42)	18 (36)	0.37 (1) 0.54	24 (48)	35 (70)	5.0 (1) 0.025
8	The correct sequence of using walker after surgery is advancing walker first then operated leg and then non-operated leg	17 (34)	13 (26)	0.76 (1) 0.38	19 (38)	36 (72)	11.67 (1) 0.001
9	The safe way of using stairs after hip/knee replacement surgery is—for going up move non-operated leg first and for moving down move operated leg first	13 (26)	14 (28)	0.05 (1) 0.82	19 (38)	38 (76)	14.72 (1) <0.001
10	Walking with crutches and walker is permitted during the 1st week of surgery	35 (70)	33 (76)	0.18 (1) 0.66	38 (76)	49 (98)	10.69 (1) 0.001
11	Hip/knee precautions have to be followed at least 3 months post-surgery	17 (34)	18 (36)	0.44 (1) 0.83	20 (40)	36 (72)	10.39 (1) 0.001
12	Following are the hip/knee precautions—do not cross legs, do not bend hips, avoid sitting on low furniture or beds	29 (58)	22 (44)	1.96 (1) 0.16	38 (76)	47 (94)	6.35 (1) 0.012
13	Isometric exercises (ankle pumps thigh and buttock tightening) to be performed every hourly post-surgery	15 (30)	11 (22)	0.83 (1) 0.36	25 (50)	40 (80)	9.89 (1) 0.002
14	Staples or sutures will be removed 2 weeks after surgery	25 (50)	29 (58)	0.64 (1) 0.42	31 (62)	43 (96)	7.48 (1) 0.06

Table 4: Comparison of study participant's knowledge regarding prevention of postoperative complications between control and experiment

N = 100							
Sl. no.	Variables	Pre-intervention		χ^2 value (df) p-value	Post-intervention		χ^2 value (df) p-value
		Correct responses			Correct responses		
		Control group (n ₁ = 50)	Experiment group (n ₂ = 50)	Control group (n ₁ = 50)	Experiment group (n ₂ = 50)		
1	Walking/stretching can prevent blood clot (DVT) in your legs after surgery	34 (68)	30 (60)	0.69 (1) 0.4	35 (70)	44 (88)	4.88 (1) 0.027
2	Pain or redness in calf, increased swelling in thigh, and fever are the signs of DVT	22 (44)	15 (30)	2.10 (1) 0.14	26 (52)	38 (76)	6.25 (1) 0.012
3	Elevating surgical leg for at least 20 minutes, placing cold packs around hip or knee for 15–20 minutes at a time, and doing walking muscle pumping exercises help in controlling swelling after hip/knee replacement surgery.	21 (42)	20 (40)	0.04 (1) 0.84	27 (54)	43 (86)	12.19 (1) 0.001
4	High-grade fever and drainage from wound are the signs of surgical wound infection	16 (32)	19 (38)	0.39 (1) 0.52	20 (40)	33 (66)	11.42 (1) 0.001
5	Wearing compression stockings after surgery helps to prevent blood clots and swelling in legs	12 (24)	22 (44)	4.4 (1) 0.03	17 (34)	31 (62)	12.38 (1) <0.001
6	Antibiotics before having dental work or any other invasive medical procedure after surgery are required	26 (48)	22 (44)	0.64 (1) 0.42	28 (64)	48 (90)	21.93 (1) <0.001



Table 5: Comparison of pre- and post-intervention mean knowledge score in control and experiment group

Knowledge score	Mean ± SD (range)		t value (df) p-value
	Control group (n ₁ = 50)	Experimental group (n ₂ = 50)	
Pre-intervention	8.54 ± 1.88 (4–15)	8.48 ± 2.02 (5–15)	0.153 (98) 0.878
Post-intervention	11.28 ± 2.53 (5–18)	16.56 ± 2.8 (9–20)	–9.83 (98) <0.001

Table 6: Frequency distribution of different domains of satisfaction among study participants in control and experiment group

Sl. no.	Variables	Control group					Experimental group				
		Very satisfied 5	Satisfied 4	Neither satisfied nor dissatisfied 3	Dissatisfied 2	Very dissatisfied 1	Very satisfied 5	Satisfied 4	Neither satisfied nor dissatisfied. 3	Dissatisfied 2	Very dis- satisfied 1
1	Explanation given to you about your disease and treatment options	3 (6)	20 (40)	26 (52)	3 (6)	–	28 (56)	20 (40)	2 (2)	–	–
2	Information provided to you about postoperative self-care	3 (6)	16 (32)	30 (60)	1 (2)	–	35 (70)	14 (28)	1 (2)	–	–
3	Understanding about what you are supposed to do at the date of surgery	1 (2)	26 (52)	3 (6)	–	–	28 (56)	21 (42)	1 (2)	–	–
4	Options of pain control after surgery	–	6 (12)	30 (60)	14 (28)	–	9 (18)	29 (58)	12 (24)	–	–
5	Exercise and mobilization protocol after surgery	1 (2)	11 (22)	28 (56)	9 (24)	1 (2)	21 (42)	24 (48)	5 (10)	–	–
6	Dietary instructions provided during the period of hospital stay	–	23 (46)	26 (52)	1 (2)	–	25 (50)	21 (42)	4 (8)	–	–
7	Information related to complications of surgery and its prevention	–	23 (46)	22 (44)	5 (10)	–	28 (56)	17 (34)	5 (10)	–	–
8	Choices you had in decisions affecting your health	–	17 (34)	29 (58)	3 (6)	1 (2)	22 (44)	24 (48)	4 (8)	–	–
9	Overall care you received in hospital	1 (2)	21 (42)	26 (52)	2 (4)	–	30 (60)	19 (38)	1 (2)	–	–
10	Discharge/home care instructions	–	15 (30)	30 (60)	5 (10)	–	34 (68)	13 (26)	3 (6)	–	–

with discharge instructions provided. It was observed that the majority of the study participants in the control group were satisfied or had a neutral response to the perioperative care and instructions they received, whereas most of the study participants were very satisfied or satisfied with the perioperative care and instructions they received. This is suggestive of a higher satisfaction level among the experimental group than the control group.

Table 7 depicts the comparison of satisfaction levels among the control group and experiment group. The mean satisfaction score ± SD of the control group was 33.06 ± 4.32, and for the experimental

group, it was 44.44 ± 4.54. There was a highly statistically significant difference in the mean satisfaction score of both the groups (p < 0.001). This is suggestive of a higher satisfaction level among participants in the experimental group.

DISCUSSION

Perioperative education preparing the patients psychologically for rehabilitation aims at providing them with clear expectations of the recovery process. It may increase their sense of responsibility

Table 7: Comparison of satisfaction level among control and experimental group

Group	Patient satisfaction score Mean \pm SD (range)	t value (df) p-value
Control group	33.06 \pm 4.32 (24–42)	-12.8 (98) <0.001
Experiment group	44.44 \pm 4.54 (32–50)	

to have active participation in postoperative self-care targeting toward a successful recovery.¹⁶

In the present study participants, knowledge was assessed regarding surgical procedure and its outcomes, positioning, diet, postoperative exercise and mobilization, and postoperative precautions. No statistically significant difference was found in pre-intervention knowledge scores of both groups. Post-intervention knowledge score increased in both control group and experiment group, but it was significantly higher in the experimental group than in the control group (p -value < 0.001).

Cheung et al. did a cross-sectional survey of 300 patients undergoing total joint arthroplasty to assess their perception and knowledge regarding total joint arthroplasty. Results showed that patients could recognize the benefits of total joint arthroplasty, but 34% had no idea how long the prosthesis could last. Also, they needed information regarding potential surgical risks and complications.¹⁷

Buttler et al. evaluated prehospital education for total hip replacement (THR) surgery. They provided preoperative education in the form of information booklet to randomly selected half of the patients awaiting THA. It was found that compared to the no-booklet patients, patients who had received the booklet were less anxious at the time of hospital admission and at discharge and had better compliance to perioperative physiotherapy during the hospital stay.¹⁸

Clode-Baker et al., in a randomized control trial, also supported the benefits of preoperative education in the form of video, booklet, and plastic models for patients undergoing THA. It was found that patients from the intervention group had a significantly higher level of knowledge before admission (p < 0.001) and felt less confronted by information on arrival for the hospital stay.¹⁹

In today's era, where patient satisfaction is of paramount importance, perioperative education has great value. Preoperative education helps to prepare patients psychologically for goals of rehabilitation by providing them with clear expectations of the recovery process.

In the present study, patient satisfaction was assessed using 10 items Likert scale assessing the core domains of patient satisfaction, which included satisfaction with an explanation of preoperative and postoperative information and teaching, pain control and mobilization protocol, dietary instructions, participation in medical decision-making, satisfaction with overall hospital care, and with discharge instructions provided to them. There was a highly statistically significant difference (p < 0.001) in the mean satisfaction score of both groups, suggestive of a higher satisfaction level among the experimental group than the control group

A similar conclusion was reported by previous studies, which reported that perioperative education reduces preoperative anxiety in patients and improves postoperative recovery. This leads to higher levels of patient satisfaction with their surgical experience.^{10,20}

Thus, in line with the findings of the previous studies and the findings of the current study support the evidence that

perioperative patient education and practice-based information can improve the postoperative outcomes of patients undergoing total joint arthroplasty.

Based on these results, we recommend a structured perioperative patient education program for the patients undergoing THA or TKA.

CONCLUSION

A perioperative patient education program for patients undergoing total joint arthroplasty was found to be effective in enhancing their knowledge regarding surgery and postoperative self-care as well as satisfaction. The patient educational program addresses the patient concerns and information regarding perioperative process. This will help them to prepare better for an upcoming surgery and motivate them to be active participants in their recovery process. Further research can be carried out to explore the most effective components and timing of education, approach (individual vs group), and other means of educational aids like video- or audio-assisted methods and telerehabilitation for better understanding of patients regarding postoperative self-care.

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