

# A Study to Assess the Effectiveness of Preoperative Teaching on Leg Exercise and Early Ambulation, on Post-Operative Recovery of Patient Undergoing Selected Abdominal Surgeries in Selected Hospitals of Pune City

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## Abstract

An experimental study was conducted to assess the effectiveness of pre-operative teaching, on leg exercise and early ambulation, on post-operative recovery of the patient undergoing selected abdominal surgeries, in selected hospital of the Pune city. The research approach used for this was post- test only control group design. The total sample size was 60; experimental group 30 and control group 30. Tools and techniques used to collect data were Demographic data and observational checklist. The samples were divided randomly in experimental & control group. In experimental group preoperative teaching and demonstration on leg exercise and early ambulation was given and immediately re-demonstration was taken from patient. Postoperatively from 1st to 6th postoperative day, morning and evening observation for ability of performance and recovery was done in both groups. Analysis of data in both group revealed that preoperative teaching on leg exercise and early ambulation improves the postoperative ability of performance. It also promotes recovery by regaining independence, reducing pain, rapid wound healing, preventing complication, and reducing hospital stay.

**Keywords:** Preoperative teaching; Leg exercise; Early ambulation; Postoperative recovery; Abdominal Surgery.

Caring for perioperative client is a challenging and gratifying specialty. Over the last 20 years, dedicated researchers and practitioners have made tremendous advances in surgical intervention and postoperative care. Operations that were once considered last-resort measures are now termed routine. Any type of surgery is stressful for the client and their family. A client faces physiological and psychological stressors when confronting surgery. Surgery is traumatic. Any surgical procedure, however minor, carries some degree of risk. Anticipating surgery causes fear and anxiety for many clients, who tend to associate surgery with pain, possible disfigurement, dependence and perhaps even loss of life. These all factors affect postoperative performance level and recovery of client. Early ambulation after surgery has been significant factor hastening postoperative

recovery and preventing postoperative complication.

Careful preparations of individuals undergoing surgery during the preoperative phase decreases operative risk and promote postoperative recovery. Systemic and structured preoperative teaching has proven benefits. Systemic and structured preoperative teaching and demonstration for a client's expected postoperative behaviors has positive influence on client's recovery. Therefore perioperative nurse has important role to provide structured preoperative teaching to client undergoing surgery.

### *Statement of the Study*

"A study to assess the effectiveness of pre-operative teaching, on leg exercise and early ambulation, on post-operative recovery of the patient undergoing selected abdominal surgeries, in selected hospital of Pune city"

### *Background of the Problem*

"If you come through your surgery in good shape, thank a perioperative nurse".

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### *Objective*

1. To develop pre-operative teaching on leg exercise and early ambulation for patient undergoing selected abdominal surgery in the experimental group.
2. To implement leg exercise and early ambulation to patient undergone selected abdominal surgery in the experimental group.
3. To compare the effectiveness of leg exercise and early ambulation in experimental and control group.
4. To compare the effectiveness of leg exercise and early ambulation on postoperative recovery.
5. To compare the effectiveness of leg exercise and early ambulation with selected variable.

### *Conceptual Framework*

Conceptual framework used for this study is based on the Pander's health promotion model. A health promotion model is a group of concepts that interact with another in order to promote health and achieve a goal.

The 1996 revision of the model add three new variables that serve to influence the individual to engage in health-promoting behaviors: activity related affects, commitment to plan of action and immediate competing demand and preferences.

### *Review of Literature*

The review of literature for present study is categorized as follow:-

1. Literature related to postoperative complication.
2. Literature related to importance of leg exercise and ambulation.
3. Literature related to effectiveness of preoperative teaching.
4. Literature related to recovery.

### **Research Design**

The research method adopted for the study was post-test only control group design

The reason for selecting this design is that in this study pretest is not essential. Keeping in view the objectives of the study, the preoperative teaching and demonstration on leg exercise and early ambulation was given only to the experimental group. Finally post-test was conducted for both groups.

### *Variables*

#### *Independent Variable*

The independent variable in this study was preoperative teaching and demonstration on leg exercise and early ambulation.

#### *Dependent Variable*

The dependent variable in this study is post-operative recovery.

#### *Hypothesis*

The level of significance chosen for the study was 0.05.

$H_0$ : There will be no significant difference in recovery between experimental group and control group.

$H_1$ : There will be significant difference in recovery between experimental group and control group.

#### *Setting of the Study*

This study was conducted in four hospitals of the Pune city.

#### *Population*

The population of the present study comprises patient undergoing abdominal surgery.

#### *Sample and Sampling Technique*

The sample of the present study comprises patient undergoing selected abdominal surgery in selected hospitals of city. The sampling technique used in this study was non-probability purposive method.

Every day a list of patients posted for abdominal surgery was made and all patients who met the criteria were selected. After selection they were divided in experimental group and control group by simple random technique.

#### *Sample Size*

Total sample size was 60. In that 30 patients were assigned in experimental group, and 30 were in control group.

#### *Inclusion Criteria*

1. Patients undergoing selected abdominal surgery

(Appendectomy, laparotomy, Cholecystectomy and hysterectomy), and with General anesthesia, Spinal anesthesia or epidural anesthesia.

2. Patient whose age group is between 18 to 60 years.
3. Duration of surgery not exceeding more than 6 hours and less than half an hour.

*Exclusion Criteria*

1. Patient who developed complication during surgery.
2. Patient with pre-existing acute medical problems like cardio-vascular disorders, orthopedic problems.
3. Patients with closed (Laparoscopic) abdominal surgery.
4. Critically ill patients.
5. Patients who were received preoperative teaching on leg exercise and ambulation during past surgery.
6. Patient who is on regular physiotherapy.

*Data Collection Techniques and Tool*

*Techniques*

The present study aimed at assessing the effect of preoperative teaching on leg exercise and early ambulation, in terms of, skills and practice in performing leg exercise and ambulation of patient undergone selected abdominal surgery, and observing its effect on recovery. Thus, the observational checklist was prepared and used for data collection.

The investigator chooses the following technique in present study.

1. Sample was selected from operation list from ward who were posted for incisional abdominal surgery. Sample was divided into experimental and control group by simple random sampling.
2. Demographic data was collected from sample after taking consent. In experimental group Preoperative teaching with demonstration on leg exercise and early ambulation was given. Duration of teaching was 20-30 minutes. Immediately re-demonstration was taken from patient.
3. Postoperatively an observation technique was used to assess the ability of performing leg exercise and ambulation by the patients and its effect on early recovery, by various parameters

(Activity of daily living, pain level, wound healing, complications and duration of hospitalization)

*Tool*

The investigator prepared the following tool for data collection; the tool was constructed according to the objectives of the study.

*Section I: Demographic data of the samples.*

*Section II: Observational checklist consists of steps of procedure for ability of performance of leg exercise and early ambulation.*

*Part A - Leg Exercise*

Total item -16

Total score -64

*Part B - Ambulation*

Total item - 4

Total score - 4

*Section III: Observational Checklist for Assessment of Recovery.*

It includes five parameters

*Part A - Activity of Daily Living*

Total score - 18

*Part B- Pain*

Pain score - 0

*Part C - Wound healing*

Total score - 12

*Part D - Complication*

Total score -5

*Part E - Duration of Hospitalization after Surgery.*

Total score - 3

*Final Scoring for Recovery (Which Include all Five Parameters)*

Total Score - 38

Excellent - 32-38

Good - 25-31

Satisfactory- 18-24

Poor - 11-17

*Validity Report*

The group of 15 experts did the content validity of tool from the field of nursing, surgery, medicine,

physiotherapy, education and statistics.

*Procedure for Data Collection*

Formal administrative permission was obtained from four hospitals. The investigator approached the subjects & obtained the consent after assuring the subjects about confidentiality of the data. The data was collected through demographic profile, clinical profile. The samples were divided randomly in two groups that are experimental & control group. In experimental group preoperative teaching on leg exercise and early ambulation was given for 20-30 mins, demonstration was given and same time re-demonstration was taken from patient. Postoperatively from 1<sup>st</sup> to 6<sup>th</sup> postoperative day, morning and evening observation for ability of performance and recovery was done. In control group intervention was not given. Postoperatively from 1<sup>st</sup> to 6<sup>th</sup> postoperative day, morning and evening observation for ability of performance and recovery was done.

*Reliability*

To check the tool, reliability inter-rator Observation method was used. For reliability 10 samples were taken. For this study Cronbachs Alpha test was used. The result was as follow: -

- Section II (ability of performance)- 0.96
- Section III (Recovery) - 0.94

All result was more than 0.8, so tool was highly reliable.

*Pilot Study*

A sample of 10 patients was selected. Five were into experimental group and five were into control group. After pilot study no changes were made in study. The study was feasible.

**Table 1:** Demographic description of samples by frequency and percentage

Demographic Data		Experimental Group		Control Group	
		Freq.	Percentage	Freq.	Percentage
Age	18-27	7	23.3	5	16.7
	28-37	7	23.3	4	13.3
	38-47	11	36.7	6	20.0
	48-57	2	6.7	7	23.3
	58-60	3	10.0	8	26.7
Sex	Female	18	60.0	23	76.7
	Male	12	40.0	7	23.3
weight	Average	4	13.3	1	3.3
	Normal	22	73.3	21	70.0
	Above Normal	4	13.3	8	26.7
Education	Illiterate	11	36.7	7	23.3
	Primary	2	6.7	5	16.7
	Secondary	10	33.3	7	23.3
	Graduate	7	23.3	9	30.0
	Post-graduate	0	0	2	6.7

**Table 2:** Demographic description of samples by frequency and percentage

Demographic data		Experimental Group		Control Group	
		Frequency	Percentage	Frequency	Percentage
Occupation	Business	0	0	2	6.7
	Service	4	13.3	5	16.7
	Farmer	7	23.3	2	6.7
	Laborer	0	0	0	0
	House wife	14	46.7	17	56.7
Income	Student	5	16.7	4	13.3
	Less than 2500	1	3.3	0	0
	2500-5000	23	76.7	1	3.3
	5000-7500	6	20.0	9	30.0
Surgery	Above 7500	0	0	20	66.7
	Appendectomy	8	26.7	7	23.3
	Laparotomy	6	20.0	10	33.3
	Hysterectomy	16	53.3	10	33.3
	Cholecystectomy	0	0	3	10.0
Type of Anesthesia	General	6	20	6	20
	Spinal	24	80	24	80

*Analysis and Interpretation of Data*

The collected data is tabulated, analyzed, organized and presented under the following headings.

*Section I*

- It deals with the analysis of the demographic

data of the samples in experimental and control group.

*Section II*

It deals with the analysis of data related to ability of performance of leg exercise and early ambulation in experimental group and control group

**Table 3:** Description of two-sample t-test for ability of performance in experimental and control group

	Experimental		Control		t value	DF	p-value	Significance
	Mean	S.D.	Mean	S.D.				
Leg Exercise	30.27	3.71	56.43	2.48	32.08	51	<0.01**	Highly significant
Ambulation	1.83	0.64	3.79	0.27	15.59	39	<0.01**	Highly significant

Above Table 3 score shows that there is highly significance difference between experimental and control group for ability of performance of leg exercise and ambulation.

*Section III*

- It includes analysis of data related to recovery in experimental and control group. Recovery

is assessed by following parameters.

- Activity of daily living
- Pain
- Wound healing
- Complication
- Duration of hospitalization

**Table 4:** Description of paired sample t-test for activity of daily living in experimental and control group

Group		mean	S.D.	S.E.	T value	DF	p-value	Significance
Experimental	Day1	9.5	1.5	0.28	28.25	29	<.01**	Highly significant
	Day6	17.7	0.78	0.14				
Control	Day1	6.5	1.17	0.21	33.22	29	<.01**	Highly significant
	Day6	14.4	1.85	0.34				

**Table 5:** Description of paired sample t-test for severity of pain

Group		Mean	S.D.	S.E.	t	DF	p-value	Significance
Experimental	Day1	4.5	.94	0.17	31	29	<.01**	Highly significant
	Day6	0.4	0.56	0.10				
Control	Day1	5.7	1.2	0.22	20.28	29	<.01**	Highly significant
	Day6	1.2	.95	0.17				

**Table 6:** Description of paired sample t-test for wound healing

Group		Mean	S.D.	S.E.	t value	DF	p-value	Significance
Experimental	Day1	6.67	0.61	0.11	39.18	29	<.01**	Highly significant
	Day6	11.53	0.51	0.09				
Control	Day1	6.17	0.75	0.14	15.17	29	<.01**	Highly significant
	Day6	10.57	1.36	0.25				

**Table 7:** Description of paired sample t-test for complication

Group	Mean	S.D.	t value	DF	p-value	Significance
Experimental	5	0	1.44	29	0.08	Not significant
Control	4.93	.25				

**Table 8:** Paired sample t-test for duration of hospitalization

Group	Mean	S.D.	T	DF	p-value	Significance
Experimental	2.6	0.56	3.5	29	<.01**	Highly significant
Control	2.03	0.67				

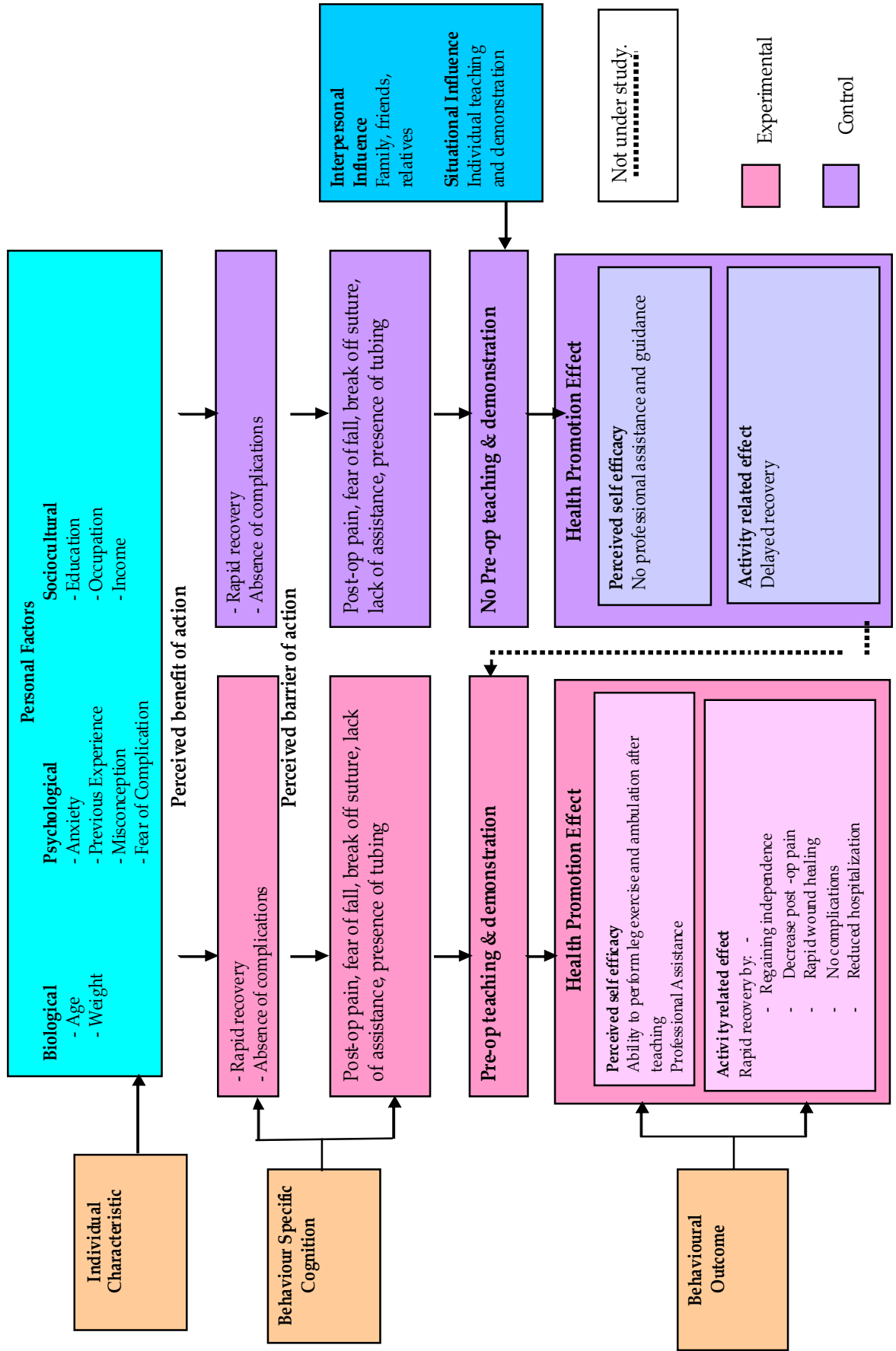


Fig. 1: Pander's health promotion model

Above finding shows that that activity of daily living are more effective in experimental group as compare to control group.

Above finding shows that experimental group has less pain as compare to control group.

Above finding shows that wound healing was effective in experimental group as compare to control

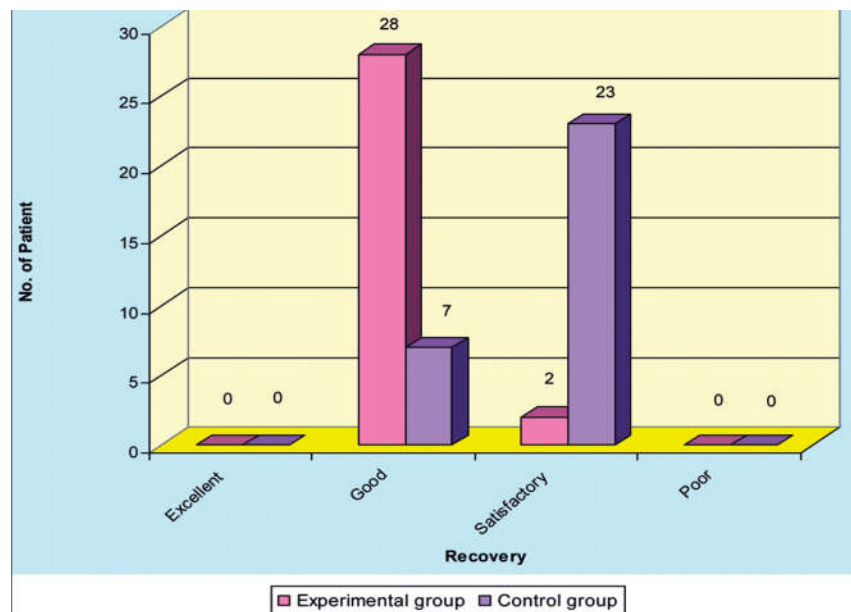
group.

Above finding show that, there is no incidence of complication, in experimental as well as in control group.

Above finding shows that duration of hospitalization after surgery was reduced in experimental group as compare to control group.

**Table 9:** Frequency and percentage distribution of recovery in experimental and control group

Recovery	Experimental		Control	
	Frequency	Percentage	Frequency	Percentage
Excellent	0	0	0	0
Good	28	93.3	7	23.3
Satisfactory	2	6.7	23	76.7
Poor	0	0	0	0



**Fig. 2:** Bar diagram comparing recovery in experimental and Control group

**Table 10:** Description of two-sample t-test for experimental and control group for recovery

	Experimental Mean	Experimental S.D.	Control Mean	Control S.D.	t value	DF	p-value	Significance
Recovery	26.20	1.17	22.74	1.79	8.87	50	<0.01**	Highly significant

For recovery, mean score obtain by experimental group was 26.20, and S.D was 1.17, whereas mean score of control group was 22.74, and S.D was 1.79, the calculated 't' value is 8.87 which significantly higher than table value at 0.01. Above score shows that there is highly significance difference in recovery between experimental and control group. Hence null hypothesis is rejected and research hypothesis is accepted.

*Section IV*

- It includes analysis of data to find the association

between ability of performance and selected demographic variables.

- It includes analysis of data to find the association between recovery and selected demographic variables.

In experimental group there is significant correlation between ability of performance and age, it also shows significant correlation between income and ability of performance.

In control group there is significant correlation between ability of performance and weight.

In experimental group there is significant correlation between recovery and occupation.

## Discussion

A similar intervention program was designed by Lindeman C.A. and Aernan B.V. They determine the effect of structured preoperative teaching. They found that the experimental group scored higher in all postoperative activity, performance and exercise. The experimental group's average stay was 1.9 days shorter than the control group. The postoperative use of analgesics was shown to be lower in the experimental group.

In present study also postoperative ability of performance of leg exercise and ambulation was excellent as compare to control group. Findings of present study also show that experimental group scored highest in activity of daily living as compare to control group. The experimental group has moderate pain on the first day of surgery and by sixth day there was no pain, whereas in control group the pain was severe on the first day of surgery and it was continue even on sixth day after surgery. In present study there was no complication seen in experimental group, whereas in control group two patients developed wound infection. The average stay of experimental group was shorter as compare to control group.

### Implications

The findings of the study have implications for perioperative nursing care practice, nursing education, nursing administration and nursing research.

### Perioperative Nursing Care Practice

Nurses working in the surgical unit can benefit from such researches, as it will provide more insight regarding the preoperative and postoperative care of surgical patient. They should know the importance of the preoperative teaching to improve postoperative performance, to regain independence, to promote wound healing, to prevent complications and to reduce hospital stay.

### Nursing Education

The nursing teachers can use the result of the study as an informative illustration for the students. Nursing education should help in inculcating values

and a sense of responsibility in the students to provide preoperative teaching and demonstration to patient about postoperative care to promote performance, to prevent complication and to promote recovery.

### Nursing Administration

The findings of the study should be used as a basis of in-service education programs for nurses so as to make them aware of importance of pre-operative teaching and demonstration to promote recovery.

### Nursing Research

Nursing research is an essential aspect of nursing as it uplifts the profession and develops new nursing norms and a body of knowledge. Another research has been added to the Nursing literature. The research design, findings and the tool can be used as avenues for further research.

### Limitations

The following points were beyond the control of the investigator:

1. The assessment of effect of the preoperative teaching is limited to postoperative observation done up to six days after surgery.
2. The study was limited to population that speaks English or Marathi.
3. The study was limited to patient undergone selected abdominal surgery in selected hospital of Pune city.
4. The study was limited to the experience level of the researcher.

### Recommendations

Keeping in view the findings of the study, the following recommendations are made:

- A similar study can be done on a larger sample.
- A study can be conducted to assess the effectiveness of leg exercise and early ambulation on postoperative recovery of patient undergoing other surgeries.
- A study can be done on association between various demographic variables, which were significant, on larger samples

## Conclusion

The purpose of the present study was to assess the effectiveness of preoperative teaching on leg



exercise and early ambulation on postoperative recovery of patient undergoing selected abdominal surgeries.

The present study can be justified on the fact that postoperative complications are very common in any type surgery most of them can be prevented if preoperative teaching and demonstration is given..

The post-test control group research design was used for the study, which consists of an experimental group and the control group. Each group consisted of 30 samples that were selected on the basis of the sampling criteria set for the study. The preoperative teaching and demonstration on leg exercise and early ambulation was given. Postoperatively the observational checklist for six days was prepared for observation of ability of performance and recovery for both groups.

Based on the objectives and the hypotheses the collected data was analyzed by using descriptive and inferential statistics.

The conclusion drawn from the findings of the study are as follows:

The 't' test done to find the effect of preoperative teaching on leg exercise and early ambulation on postoperative recovery of patient undergoing selected abdominal surgeries revealed that there is a significant difference in experimental and control group regarding ability of performance and early recovery. Preoperative teaching on leg exercise and early ambulation has shown a significant effect in improving their ability of performance after surgery and rapid recovery.

One of the important roles of nurse is to provide planned preoperative teaching, which helps to prevent complication. She can carry out teaching along with demonstration in best possible way to prevent complication and to hasten rapid recovery.

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