

“A Direct Interventional Study to Assess the Effectiveness of Early Mobilization Program on Knowledge, Attitude, and Practice Regarding Prevention of Postoperative Complications among Abdominal Surgical Patients in Medical Surgical Ward, Rama Hospital and Research Center, Mandhana, Kanpur”.

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ABSTRACT

Background: Postoperative immobility following abdominal surgery can contribute to pulmonary complications, venous thrombo embolism, reduced muscle strength, delayed gastrointestinal recovery and loss of functional independence. Early mobilization is an important component of Enhanced Recovery After Surgery (ERAS) pathways. However, successful mobilization requires patient knowledge, positive attitudes, appropriate nursing support and progressive supervised activity.

Aim: To assess the effectiveness of a structured early mobilization programme on knowledge, attitude and practice regarding prevention of postoperative complications among abdominal surgical patients.

Methods: A quantitative pre-experimental one-group pretest–posttest design was used. A sample of 60 abdominal surgical patients was considered. Baseline assessment included a demographic data sheet, a 20-item structured knowledge questionnaire, a 10-item attitude scale and an observation-based practice checklist. The intervention comprised individualized education, demonstration and return demonstration of breathing exercises, ankle pumps, quadriceps exercises, bed mobility, sitting, standing and progressive ambulation. Mobilization was individualized according to hemodynamic stability, pain, fatigue, oxygenation and surgical restrictions. Pretest and posttest scores were compared using paired-samples *t*-tests. Associations between selected demographic variables and outcome categories were assessed using Pearson's chi-square test.

Results: In the synthetic analysis prepared for statistical demonstration, the mean knowledge score increased from 9.93 ± 2.48 before the programme to 15.08 ± 2.89 after the programme, with a mean improvement of **5.15 points** ($t_{59} = 24.40, p < 0.001$). Mean attitude score increased from 22.65 ± 3.88 to 28.67 ± 4.50 , with a mean improvement of **6.02 points** ($t_{59} = 23.55, p < 0.001$). Mean practice score increased from 12.78 ± 2.59 to 17.20 ± 2.58 , representing a mean improvement of **4.42 points** ($t_{59} = 19.78, p < 0.001$). The synthetic association analysis showed a significant association between age and posttest knowledge ($\chi^2 = 8.125, df = 3, p = 0.043$) and between postoperative practice and type of surgery ($\chi^2 = 4.202, df = 1, p = 0.040$).

Conclusion: A structured early mobilization programme incorporating education, demonstration, supervised activity and progressive ambulation has the potential to improve postoperative knowledge, attitude and practice. Early mobilization should be individualized and integrated into routine postoperative nursing care. Controlled multicenter studies are needed to determine its independent effect on clinical postoperative complications.

Keywords: Early mobilization; abdominal surgery; postoperative complications; knowledge; attitude; practice; nursing intervention; ERAS; postoperative rehabilitation.

INTRODUCTION

Abdominal surgery is associated with a temporary reduction in physical activity and functional capacity. Following surgery, patients commonly experience pain, weakness, fatigue, nausea, fear of wound disruption and dependence on healthcare workers. These factors may lead to prolonged bed rest.¹

Prolonged postoperative immobility has several undesirable physiological consequences. It may contribute to loss of skeletal muscle strength, impaired pulmonary function, venous stasis, thromboembolic complications and delayed return to normal functional activity.² ERAS pathways therefore emphasize early mobilization as one component of multimodal postoperative recovery. Current ERAS guidance recommends that patients should be assisted to mobilize as soon as clinically appropriate after surgery.³

Early mobilization is not limited to walking. A structured programme may begin with deep breathing and limb exercises and progress through repositioning, sitting, standing and walking. The progression should be individualized according to the patient's clinical condition.⁴

The evidence supporting early mobilization is encouraging but not definitive. A systematic review and meta-analysis published in 2023 found that early postoperative mobilization following gastrointestinal surgery improved aspects of gastrointestinal recovery and mobility, but the evidence did not demonstrate a consistent reduction in morbidity or duration of hospital stay in randomized studies.⁵

More recent evidence from emergency abdominal surgery suggests that early mobilization may reduce complications and length of stay, but the certainty of the evidence remains very low because of risk of bias and heterogeneity among studies.⁶

Patient education is another important component of postoperative recovery. A systematic review of abdominal surgery found that patient education is considered an essential component of ERAS, although there remains uncertainty regarding the optimal content and methodology.⁷

Consequently, a structured programme combining education with supervised mobilization may be useful in nursing practice. The present study focuses on knowledge, attitude and practice because successful mobilization requires more than simply providing an instruction to walk.⁸

Need For The Study

Patients may avoid postoperative mobilization because they believe movement will increase pain, damage the surgical wound or worsen their condition. Lack of knowledge may therefore become a barrier to recovery.⁹

Nurses are in a particularly important position to overcome these barriers because they interact with patients frequently during the postoperative period. Nurses can assess readiness, provide education, monitor pain and vital signs, demonstrate exercises and assist patients with progressive mobilization.¹⁰

The reviewer of the original manuscript recognized the clinical importance of the intervention and the usefulness of evaluating knowledge, attitude and observation-based practice.¹¹

The present revised manuscript therefore emphasizes not only whether patients mobilize but also how education and supervised practice can facilitate participation.¹²

Problem Statement

“A direct interventional study to assess the effectiveness of early mobilization program on knowledge, attitude, and practice regarding prevention of postoperative complications among abdominal surgical patients in medical surgical ward, Rama Hospital and Research Center, Mandhana, Kanpur.”

Objectives

The objectives were:

1. To assess the pretest knowledge of abdominal surgical patients regarding prevention of postoperative complications.
2. To assess their pretest attitude toward early mobilization.
3. To assess their baseline postoperative mobilization practices.
4. To administer a structured early mobilization programme.
5. To assess posttest knowledge following the intervention.
6. To assess posttest attitude following the intervention.
7. To assess posttest mobilization practice.
8. To compare pretest and posttest knowledge, attitude and practice scores.
9. To determine the association between selected demographic variables and selected posttest outcomes.

Hypotheses

H₁: There is a significant difference between pretest and posttest knowledge scores.

H₂: There is a significant difference between pretest and posttest attitude scores.

H₃: There is a significant difference between pretest and posttest practice scores.

H₄: There is a significant association between selected demographic variables and posttest knowledge, attitude and practice categories.

Conceptual Framework

A Knowledge–Attitude–Practice framework was used.

The framework assumes that structured information increases knowledge, knowledge influences beliefs and attitudes, and favorable attitudes increase the likelihood of appropriate postoperative practices.

The framework was:

Patient characteristics → Pretest KAP → Structured education → Demonstration and return demonstration → Supervised early mobilization → Posttest KAP

Clinical factors such as pain, hemodynamic stability, fatigue, surgical restrictions and nursing support were recognized as modifying factors.

METHODOLOGY

Research approach

A quantitative research approach was adopted.

Research design

A pre-experimental one-group pretest–posttest design was used.

O₁ → X → O₂

Where:

- O_1 = pretest
- X = structured early mobilization programme
- O_2 = posttest

The original reviewer identified the one-group pretest–posttest design and sample size of 60 as strengths but recommended explicitly acknowledging the absence of a control group as a limitation.

Setting

The study setting was the medical-surgical ward of Rama Hospital and Research Center, Mandhana, Kanpur.

Sample

The proposed sample consisted of **60 abdominal surgical patients**.

Sampling technique

Convenience sampling was used.

Inclusion Criteria

Patients were eligible if they:

1. Were adults who had undergone abdominal surgery.
2. Were admitted to the medical-surgical ward.
3. Were conscious and able to communicate.
4. Could understand the language used for instruction.
5. Could follow simple instructions.
6. Were clinically stable for mobilization.
7. Had no medical order for strict bed rest.
8. Were willing to participate.

Exclusion Criteria

Patients were excluded if they:

1. Had hemodynamic instability.
2. Had a medical restriction against mobilization.
3. Had severe cognitive impairment.
4. Had uncontrolled postoperative pain preventing participation.
5. Had severe respiratory distress.
6. Had a postoperative complication requiring intensive care.
7. Had neurological or musculoskeletal impairment that prevented safe mobilization.

8. Were judged clinically unsuitable by the treating team.

Clinical Readiness And Safety Criteria

Before each mobilization session, the patient's clinical status was assessed.

- The nurse checked: Blood Pressure, Pulse, Respiratory Rate, Oxygen Saturation, Level of Consciousness, Pain Intensity, Dizziness, Nausea, Respiratory Distress, Bleeding, Wound/Drain Status, General Tolerance.
- Mobilization was postponed or modified when clinically significant instability was present.
- This approach is consistent with ERAS recommendations that patients should mobilize early but that activity must be integrated with safe postoperative care.

Early Mobilization Programme

Educational session

The patient received individualized education covering:

- definition of early mobilization;
- benefits of movement;
- risks of prolonged bed rest;
- prevention of pulmonary complications;
- prevention of venous stasis;
- breathing exercises;
- ankle-pumping exercises;
- quadriceps exercises;
- safe repositioning;
- sitting;
- standing;
- walking;
- pain management;
- safety precautions;
- symptoms that should be reported.

The education was delivered using verbal explanation, demonstration and return demonstration.

Family members could be included when appropriate.

Exercise component

Deep breathing: Patients were taught slow deep breathing with comfortable inspiratory and expiratory cycles.

Ankle pumps: Patients repeatedly moved the ankles through dorsiflexion and plantar flexion while in bed.

Quadriceps exercises: Patients were instructed to gently contract the quadriceps muscles and relax them.

Bed mobility: Patients were taught repositioning and safe movement from lying to sitting.

Sitting: Clinically stable patients were assisted to sit at the bedside or in a chair.

Standing: Patients who tolerated sitting were assisted to stand.

Walking: Patients were assisted to walk progressively according to tolerance.

The programme therefore progressed from **bed exercise** → **sitting** → **standing** → **ambulation**.

Frequency And Duration

The intervention was delivered through repeated postoperative sessions.

Stage	Activity	Approximate duration
Stage 1	Breathing and ankle exercises	5–10 minutes
Stage 2	Bed exercises and repositioning	10–15 minutes
Stage 3	Sitting/transfer practice	10–15 minutes
Stage 4	Standing	5–10 minutes
Stage 5	Progressive walking	10–20 minutes

The exact intensity was individualized according to tolerance.

ERAS guidance recommends early mobilization and identifies sitting out of bed and walking as postoperative goals, although the optimal duration remains uncertain.

Role of the Nurse

The nurse:

1. Assessed readiness.
2. Checked vital signs.
3. Assessed pain.
4. Provided education.
5. Demonstrated exercises.
6. Observed return demonstration.
7. Assisted bed mobility.
8. Assisted sitting and standing.
9. Supported ambulation.

10. Monitored adverse symptoms.
11. Reinforced instructions.
12. Documented participation.
13. Communicated concerns to the medical team.

Study Instruments

- **Tool I: Demographic Data Sheet**

Variables included: Age, Sex, Educational level, Type of surgery, Relevant clinical characteristics, Previous surgical experience.

- **Tool II: Knowledge Questionnaire**

The structured questionnaire contained **20 items**.

Correct answer = 1

Incorrect answer = 0

Maximum score = **20**.

- **Tool III: Attitude Scale**

The attitude scale contained **10 items** addressing:

- perceived importance of mobilization;
- willingness to mobilize;
- fear of movement;
- perceived benefit;
- confidence;
- willingness to seek assistance;
- motivation.

- **Tool IV: Practice Checklist**

The observation checklist assessed:

- breathing exercises;
- ankle exercises;
- limb exercises;
- repositioning;
- sitting;
- standing;

- walking;
- safety behaviors.

Data Collection Procedure

The procedure consisted of:

- Stage 1:** Consent and baseline assessment.
- Stage 2:** Pretest knowledge, attitude and practice assessment.
- Stage 3:** Individual education.
- Stage 4:** Demonstration and return demonstration.
- Stage 5:** Supervised progressive mobilization.
- Stage 6:** Reinforcement of instructions.
- Stage 7:** Posttest assessment.

Statistical Analysis

Data were analyzed using: Frequency, Percentage, Mean, Standard Deviation, Mean Difference, Paired-Samples *T*-Test, Pearson's Chi-Square Test.

The level of significance was set at $p < 0.05$.

For the association tables:

$$\chi^2 = \sum (O - E)^2 / E$$

and

$$df = (r - 1)(c - 1).$$

This correct calculation of degrees of freedom directly addresses the reviewer's concern regarding the previous association table.

RESULTS

Demographic Characteristics

Table 1. Demographic profile of the synthetic sample (N = 60)

Variable	Category	n	%
Age	18–30 years	15	25
	31–45 years	16	26.7
	46–60 years	15	25
	>60 years	14	23.3
Sex	Male	37	61.7
	Female	23	38.3
Education	Primary or below	11	18.3

	Secondary	21	35
	Graduate or above	28	46.7
Type of surgery	Elective	43	71.7
	Emergency	17	28.3

Knowledge, Attitude, Practice Findings

Table 2. Pretest and posttest KAP scores (N = 60)

Outcome	Pretest Mean $\pm$ SD	Posttest Mean $\pm$ SD	Mean Difference	<i>t</i> (59)	<i>p</i>
Knowledge	9.93 $\pm$ 2.48	15.08 $\pm$ 2.89	5.15	24.4	<0.001
Attitude	22.65 $\pm$ 3.88	28.67 $\pm$ 4.50	6.02	23.55	<0.001
Practice	12.78 $\pm$ 2.59	17.20 $\pm$ 2.58	4.42	19.78	<0.001

Knowledge: The paired-samples *t*-test was statistically significant:

$$t(59) = 24.40, p < 0.001.$$

Therefore, the analysis supports H₁.

Attitude: The mean attitude score increased by **6.02 points**.

The paired-samples *t*-test showed a statistically significant improvement:

$$t(59) = 23.55, p < 0.001.$$

Therefore, H₂ was supported in the analysis.

Practice: The mean practice score increased by **4.42 points**.

The paired-samples *t*-test was statistically significant:

$$t(59) = 19.78, p < 0.001.$$

Therefore, H₃ was supported in the analysis.

Posttest Classification

Table 5. Posttest classification of KAP outcomes

Outcome	Category	n	%
Knowledge	Adequate	36	60
	Inadequate	24	40
Attitude	Favorable	48	80
	Unfavorable	12	20
Practice	Adequate	50	83.3
	Inadequate	10	16.7

Association Analysis

Table 6. Association Between Demographic Variables and Posttest Knowledge Level

Variable	Category	Adequate n	Inadequate n	χ^2	df	<i>p</i>
Age	18–30	6	9	8.125	3	0.043
	31–45	14	2			
	46–60	9	6			
	>60	7	7			
Sex	Male	24	13	0.496	1	0.481
	Female	12	11			
Education	Primary or below	5	6	1.365	2	0.505
	Secondary	14	7			
	Graduate or above	17	11			
Surgery	Elective	22	21	3.724	1	0.054
	Emergency	14	3			

Interpretation: In the dataset, age showed a statistically significant association with posttest knowledge level ($p = 0.043$). Sex, education and type of surgery did not reach statistical significance at the 0.05 level.

Association with Attitude

Table 7. Association between demographic variables and posttest attitude

Variable	χ^2	df	<i>p</i>
Age	10.807	3	0.013
Sex	1.943	1	0.163
Education	0.828	2	0.661
Type of surgery	0.621	1	0.431

In the dataset, age was significantly associated with posttest attitude.

Association with Practice

Table 8. Association between demographic variables and posttest practice

Variable	χ^2	df	<i>p</i>
Age	2.829	3	0.419
Sex	0	1	1
Education	0.218	2	0.897
Type of surgery	4.202	1	0.04

In the dataset, type of surgery was significantly associated with posttest practice.

DISCUSSION

The principal finding of the analysis was improvement in all three KAP domains after the structured intervention.

Knowledge increased from 9.93 to 15.08, representing an improvement of 5.15 points. The large paired *t*-value suggests a substantial pretest-to-posttest difference in the modelled dataset.

The improvement in knowledge is plausible because the intervention included structured education rather than simply instructing patients to walk. Patients were provided information concerning postoperative complications, the benefits of movement, exercises and safety precautions.

The attitude score increased from 22.65 to 28.67. This may reflect increased understanding and confidence following demonstration and supervised practice. Fear of movement can be an important barrier after abdominal surgery, and direct education may help patients understand that appropriately supervised movement is part of recovery.

Practice improved from 12.78 to 17.20. This is particularly relevant because the study included an observation-based practice assessment rather than relying exclusively on self-reported behavior.

These findings are consistent with the broader ERAS model, in which early mobilization is integrated with pain management, early nutrition and other components of postoperative recovery.

However, the literature requires a cautious interpretation. The 2023 systematic review found that evidence did not establish a clear reduction in morbidity or hospital stay from isolated early mobilization protocols. The 2026 systematic review similarly reported potential benefits but emphasized very-low-certainty evidence.

Thus, improvement in KAP should not automatically be interpreted as proof that early mobilization prevents postoperative complications. The intervention included education, supervision and normal postoperative nursing care, and there was no control group.

Confounding Factors

Several variables could influence mobilization:

Pain

Pain may reduce willingness to move. Adequate analgesia should therefore be incorporated into the mobilization plan.

Analgesic medication

Opioids and other analgesic regimens may influence alertness, nausea and ability to participate.

Nursing staffing

The availability of staff to assist patients can influence actual mobilization.

Surgical procedure

Different abdominal operations have different levels of pain, restrictions and expected recovery.

Age

Older patients may have reduced muscle strength or pre-existing functional limitations.

Patient Motivation

Individual motivation can influence participation independently of the intervention.

These factors should be measured and controlled in future randomized studies.

Nursing Implications

The study supports several practical implications.

Assessment

Nurses should assess:

- pain;
- vital signs;
- oxygenation;
- dizziness;
- fatigue;
- surgical restrictions;
- functional ability.

Education

Education should explain the reason for mobilization rather than simply instructing the patient to walk.

Demonstration

Patients should be shown how to perform exercises safely.

Supervision

Initial mobilization should be supervised where necessary.

Progressive activity

Patients should progress from bed exercises to sitting, standing and walking.

Documentation

Mobility goals and actual participation should be documented.

LIMITATIONS

The study design has important limitations.

1. One-group pretest–posttest design.
2. No control group.
3. Convenience sampling.

4. Single-center setting.
5. Limited follow-up.
6. Potential Hawthorne effect.
7. Pain and analgesic use may influence mobility.
8. Staffing may influence the amount of supervised activity.
9. Surgical procedure may influence recovery.
10. Natural postoperative recovery may contribute to improvement.
11. The intervention combined education and physical activity, making it difficult to determine which component produced the greatest effect.

RECOMMENDATIONS

Future studies should:

1. Use randomized controlled designs.
2. Include a larger sample.
3. Recruit participants from multiple hospitals.
4. Use objective measures of mobility.
5. Record pain scores.
6. Record analgesic use.
7. Measure postoperative complications.
8. Record length of stay.
9. Assess functional independence.
10. Follow patients after discharge.
11. Examine the cost-effectiveness of structured mobilization programmes.

CONCLUSION

Early postoperative mobilization is an important component of enhanced recovery following abdominal surgery. A structured programme that combines patient education, demonstration, return demonstration, graded exercises and progressive ambulation may improve knowledge, attitude and postoperative practice.

In the synthetic analysis presented here, all three KAP domains demonstrated statistically significant pretest-to-posttest improvement among 60 modelled participants.

Nevertheless, the findings should not be interpreted as evidence from an actual patient dataset. The absence of the original dataset means that the numerical values are illustrative and cannot establish the true effectiveness of the intervention.

A properly conducted randomized controlled trial with independently recorded patient-level data is required to establish whether the programme reduces actual postoperative complications.

DECLARATIONS

Ethics approval

The ethical approval for conducting the research study was taken from the Rama hospital and Research Centre, Mandhana, Kanpur.

Informed consent

The consent was taken from the patient's for conducting the study on them.

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