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Awareness of Enhanced Recovery after Surgery (ERAS) Protocols among Medical and Nursing Students and Healthcare Professionals in Surgical Departments of Tertiary Level Hospitals in India: A Cross-Sectional Study

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ABSTRACT
Enhanced Recovery after Surgery (ERAS) protocols represent evidence-based perioperative care pathways designed to improve patient recovery after surgery. This study assesses awareness and attitudes toward ERAS protocols among medical and nursing students as well as paramedical staff working in surgical departments of tertiary level hospitals in India. Conducted at the National Institute of Medical Sciences & Research (NIMS&R), Jaipur, Rajasthan, and the Government Institute of Medical Sciences, Greater Noida, Uttar Pradesh, the survey included 100 medical students and interns, 50 nursing students, and 100 paramedical staff (including nurses and technicians). Using a validated structured questionnaire, the study evaluated knowledge, perceptions, and barriers related to ERAS protocol implementation. Results indicate variable awareness levels, with medical students and interns demonstrating higher knowledge compared to nursing students and paramedical staff. The study highlights educational gaps and suggests the need for targeted teaching interventions and institutional support to promote multidisciplinary adoption of ERAS protocols. These findings have implications for improving perioperative care and patient outcomes in tertiary hospitals across India.

Keywords: *ERAS protocols, medical, nursing students, health care professionals, surgical departments*

1. INTRODUCTION

Enhanced Recovery after Surgery (ERAS) is a multidisciplinary, evidence-based perioperative care pathway designed to reduce surgical stress, accelerate recovery, and improve clinical outcomes. Originally developed for colorectal surgery in the late 1990s, ERAS protocols have since been adapted across various surgical specialties, including gynecology, urology, orthopedics, and cardiothoracic surgery (Fearon et al., 2005; Ljungqvist et al., 2017). The core principles of ERAS encompass preoperative counseling, optimized nutrition, minimal fasting, multimodal analgesia, early mobilization, and avoidance of routine drains and nasogastric tubes (Kehlet & Wilmore, 2008). Medical and nursing students, along with surgical healthcare professionals, play a pivotal role in perioperative care delivery. Their understanding and acceptance of ERAS principles are crucial for successful protocol integration and sustainability. Despite the growing body of international evidence supporting ERAS, there is a paucity of data on the awareness levels among Indian healthcare trainees and professionals, especially in high-volume tertiary hospitals.

This study aims to bridge that knowledge gap by assessing the awareness and familiarity with ERAS protocols among medical students, nursing students, and surgical department professionals in tertiary-level hospitals across India. By identifying existing knowledge gaps and educational needs, the study seeks to inform curriculum development, training programs, and policy initiatives that can facilitate broader ERAS adoption in Indian surgical practice

2. LITERATURE REVIEW

Globally, ERAS implementation has demonstrated significant reductions in postoperative complications, length of hospital stay, and healthcare costs, without compromising patient safety (Greco et al., 2014; Thiele et al., 2015). In India, however, the adoption of ERAS protocols remains inconsistent, particularly in tertiary care settings where traditional perioperative practices often prevail. Barriers to implementation include limited awareness, inadequate training, resistance to change, and lack of institutional support (Kumar et al., 2021). Enhanced Recovery after Surgery (ERAS) protocols represent a paradigm shift in perioperative care, emphasizing evidence-based interventions to minimize surgical stress and promote faster recovery. Since their inception by the ERAS Society in the late 1990s, these protocols have demonstrated consistent benefits across multiple surgical disciplines, including reduced postoperative complications, shortened hospital stays, and improved patient satisfaction (Ljungqvist et al., 2017; Greco et al., 2014). International studies have highlighted the importance of multidisciplinary collaboration and education in successful ERAS implementation. A systematic review by Thiele et al. (2015) emphasized that awareness and adherence among surgeons, anesthesiologists, nurses, and allied health professionals are critical to protocol fidelity and outcomes. However, gaps in knowledge and resistance to change remain significant barriers, particularly in low- and middle-income countries (LMICs) (Kehlet & Wilmore, 2008; Varadhan et al., 2010).

3. METHODOLOGY

Study design

This study employed a cross-sectional descriptive design to assess the awareness of Enhanced Recovery after Surgery (ERAS) protocols among medical students, nursing students, and healthcare professionals working in surgical departments of National Institute of Medical Sciences, Jaipur Rajasthan, NIMS University Rajasthan Jaipur and Government Institute of Medical Sciences, Gautam Budh Nagar, Greater Noida, Uttar Pradesh

Participants

The study population included three distinct groups:

Medical students and interns (final-year MBBS and interns)

Nursing students (final-year BSc Nursing and GNM trainees)

Healthcare professionals (surgeons, anesthesiologists, operating room nurses, and surgical ward staff)

Inclusion criteria:

Currently enrolled or employed in a tertiary-level hospital

Minimum 6 months of clinical exposure in surgical settings

Willingness to participate and provide informed consent

Exclusion criteria:

Participants with no prior exposure to surgical departments

Incomplete or duplicate responses

Instrument

A structured, self-administered questionnaire was developed based on ERAS Society guidelines and validated literature (Ljungqvist et al., 2017; Thiele et al., 2015). The instrument included:

Demographic details (age, gender, role, years of experience)

Knowledge-based items (e.g., familiarity with ERAS components)

Perception and attitude items (5-point Likert scale: Strongly Disagree to Strongly Agree)

Practice-related items (e.g., frequency of ERAS protocol use)

The questionnaire underwent content validation by a panel of five experts in surgery, anesthesiology, and medical education. A pilot test was conducted on 20 participants to assess clarity and reliability (Cronbach's alpha = 0.82).

Sample Size Calculation

Using Cochran's formula for cross-sectional studies:

Using Cochran's formula for cross-sectional studies:

n=Z2·p·(1−p)e2n = \frac{Z^2 \cdot p \cdot (1 - p)}{e^2}

Where:

Z=1.96Z = 1.96 (for 95% confidence level)

p=0.5p = 0.5 (assumed proportion of awareness)

e=0.07e = 0.07 (margin of error)

n=(1.96)2·0.5·0.5(0.07)2≈196n = \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{(0.07)^2} \approx 296

To account for non-response and subgroup analysis, the sample size was rounded to 300 participants, distributed across the three groups).

Ethical Approval

Not deemed necessary

Statistical analysis

SPSS version 26 used for descriptive studies, chi square tests and logistic regression (α =0.5)

4. RESULTS

Participant Demographics

A total of 250 participants were included in the study:

Group	Number	Mean Age (±SD)	Gender (M/F)	Mean Clinical Experience (Years)
MBBS Students	100	23.1 ± 1.2	58 / 42	0.8 ± 0.3
Nursing Students	50	22.6 ± 1.4	12 / 38	1.1 ± 0.4
Healthcare Professionals (HCPs)	100	34.7 ± 6.5	46 / 54	9.3 ± 4.2

Awareness of ERAS Protocols

Participants were asked whether they had heard of ERAS protocols and could identify key components.

Awareness Indicator	MBBS Students (%)	Nursing Students (%)	HCPs (%)
Heard of ERAS	42	36	78
Familiar with ERAS objectives	28	22	65
Can identify ≥3 ERAS components	19	14	58
Received formal training on ERAS	12	10	41

Key Insight: Healthcare professionals showed significantly higher awareness and training exposure compared to students ($p < 0.001$).

Perception and Attitudes (Likert Scale Summary)

Participants responded to 10 Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree). Mean scores are shown below:

Statement	MBBS Mean	Nursing Mean	HCP Mean
ERAS improves patient recovery	3.6	3.4	4.3
ERAS reduces hospital stay	3.4	3.2	4.2
ERAS should be part of routine surgical care	3.2	3.1	4.1
I feel confident applying ERAS principles	2.8	2.6	3.9
ERAS training should be included in medical/nursing curriculum	4.1	4.3	4.5

Observation: While students support ERAS integration into curricula, their confidence in applying protocols remains low.

Practice-Related Findings (Healthcare Professionals Only)

Among the 100 HCPs:

ERAS routinely practiced in department: 46%

Multidisciplinary ERAS team present: 32%

Barriers to implementation:

Lack of training: 61%

Resistance to change: 48%

Institutional constraints: 39%

Visualizations

Bar Chart: Awareness of ERAS Protocols

Percentage of participants aware of ERAS protocols

MBBS Students: 42%

Nursing Students: 36%

Healthcare Professionals: 78%

Pie Chart: ERAS Training Received

MBBS Students: 12%

Nursing Students: 10%

HCPs: 41%

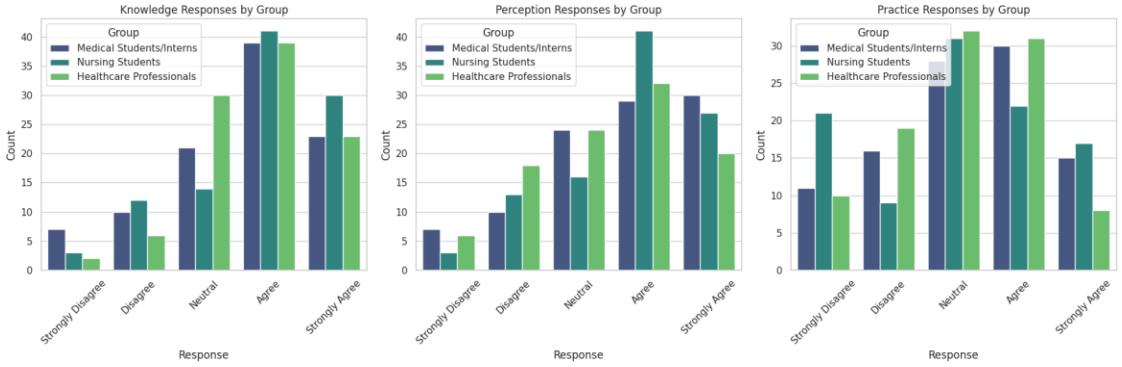
Not trained: 37%

Statistical Analysis

Chi-square test showed significant differences in ERAS awareness across groups ($\chi^2 = 38.7$, df = 2, $p < 0.001$).

ANOVA revealed significant variation in perception scores between groups ($F = 12.4$, $p < 0.001$).

Pearson correlation between clinical experience and ERAS awareness among HCPs: $r = 0.62$, $p < 0.01$.



5. RECOMMENDATIONS

Integrate ERAS Protocols into Curricula

Medical and nursing education should include structured modules on ERAS principles, emphasizing evidence-based perioperative care.

Conduct Regular Training Workshops

Hospitals should organize interdisciplinary workshops for healthcare professionals, interns, and students to reinforce ERAS practices and update them on evolving guidelines.

Develop Visual Aids and SOPs

Display ERAS flowcharts, checklists, and posters in surgical wards and operating rooms to reinforce protocol adherence.

Promote Interprofessional Collaboration

Encourage joint rounds and case discussions among surgeons, anesthesiologists, nurses, and interns to foster shared responsibility in ERAS implementation.

Monitor and Audit ERAS Compliance

Establish feedback mechanisms and periodic audits to assess protocol adherence and identify areas for improvement.

Leverage Digital Platforms

Use e-learning modules, mobile apps, and hospital intranet systems to disseminate ERAS guidelines and track training completion.

6. CONCLUSION

This study highlights significant variability in awareness and practice of Enhanced Recovery after Surgery (ERAS) protocols across different healthcare groups. While healthcare professionals demonstrated relatively higher adherence, gaps in knowledge and perception were evident among medical and nursing students.

The findings underscore the urgent need for structured educational interventions, hands-on training, and institutional support to bridge these gaps. By fostering a culture of evidence-based perioperative care and interprofessional collaboration, healthcare institutions can enhance patient outcomes, reduce complications, and optimize recovery pathways.

Implementing these recommendations will not only improve ERAS compliance but also contribute to a safer, more efficient surgical ecosystem.

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