A STUDY ON ASSESSMENT OF KNOWLEDGE ATTITUDE AND PRACTISE OF ENHANCED RECOVERY AFTER SURGERY ON HEALTH CARE PROFESSIONALS AT TIKUR ANBESSA SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA IN 2021

Training Programme in Anesthesiology, critical care and pain medicine. Thesis to be submitted to the school of medicine and health sciences, department of Anesthesiology, Critical care and Pain medicine for the partial fulfillment of the requirements of specialty

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STATEMENT OF DECLARATION

I hereby declare and affirm that this research is my own original work as a partial fulfillment of the requirement for the specialty certificate training in Anesthesiology, Critical Care and Pain Medicine. I have followed all the ethical consideration in the preparation, data collection, data analysis and completion of this research. All the sources of the material used for this research and all people and institution who gave support for this work are fully acknowledged. I have sited and referenced all the sources used in this research document.

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ACRONYM AND ABBERIVATIONS

ACCPM: Anesthesiology Critical care and Pain Medicine

DM: Diabetes Mellitus

ERAS: Enhanced Recovery After Surgery

GDFT: Goal Directed Fluid Therapy

GA: General Anesthesia

HCP: Health Care Professionals

Hrs: Hours

IV: Intravenous

KAP: Knowledge, Attitude and Practice

MBP; Mechanical Bowel Preparation

MV: Mechanical Ventilation

NGT: Nasogastric Tube

OR: Operating Room

POVL: Postoperative Nausea and Vomiting

POI: Postoperative Ileus

RCT: Randomized Control Trial

TASH: TikurAnbesa Specialized Hospital

Table 1: Research project submission form

Principal investigator	Dr.Getu Ashagrie. ACCPMR3
Advisors	Dr. Mesfin Girma. Consultant Anesthesiologist Dr.Mahlet Tadesse. Consultant Anesthesiologist
Title of research proposal	Assessment of KAP of ERAS on Health care professionals
Duration of research	Six Months
Study area	TikurAnbesa specialized Hospital, Major OR /TASH
Total cost of the project	
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Acknowledgment

First, I would like to thank TASH department of Anesthesiology, critical care and pain medicine for giving this opportunity to do this research. My heart-felt gratitude goes to my advisors Dr. Mesfin Girma and Dr.Mahlet Tadesse for all their supports, expert advice, suggestions and assistance in all aspects of this research. I would like to say thanks to my friends for their constant support.

Abstract

Introduction : ERAS ,first introduced in 2005 is a combination of various perioperative patient care methods based on a multimodal approach that integrates evidence based interventions to reduce surgical stress ,maintain post operative physiological function and accelerate recovery in patients undergoing major surgery, GI surgery ,Urological surgery ,Orthopedic surgery , Gynecologic surgery ,thoracic and breast surgery.

Objective: To assess Knowledge attitude and practice of ERAS on HCPs at TASH, Addis Ababa, Ethiopia during data collection time.

Methodology: Institutional based quantitative cross sectional prospective observational study was employed .Anesthetists, Anesthesiologists, Surgeons, Surgical residents, Anesthesiology residents and nurses working at TASH surgical wards and OR during data collection period were included. Data was analyzed using SPSS version 25 statistical software.

Results of the Study: Almost all ACCPM has good knowledge (90.7%) on ERAS Protocols; on the other hand, only 21 % of nurses have good knowledge. Most of ACCPM (85%) and surgical team (83%) have good attitude about ERAS. On the contrary, only 15% of nurses have a positive attitude about ERAS. Study participants with work experience of 1-5 years have the highest proportion of participants with positive attitude. The majority of ACCPM (70%) and surgical team (58%) have good practice of ERAS. However, only 36% of nurses have good practice about ERAS. Study participants with work experience of 1-5 years have the highest proportion of participants with good practice.

Conclusion: Based on these findings more than half of study participants have good knowledge, positive attitude and good practice of ERAS protocol. However, nurses have shown the lowest score in knowledge attitude and practice of ERAS.

Recommendation Clinicians should implement the ERAS protocol appropriately. In addition, training and continuous professional development activities on ERAS protocol should be designed and implemented particularly targeting those with work experience of greater than five years and nurses. Moreover, a multidisciplinary group approach should be taken when implementing the ERAS protocol to facilitate effectiveness and learning environment for those that didn't achieve optimal knowledge attitude and practice of ERAS protocol.

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1. Introduction

1.1. Background

ERAS ,first introduced in 2005 is a combination of various perioperative patient care methods based on a multimodal approach that integrates evidence based interventions to reduce surgical stress ,maintain post operative physiological function and accelerate recovery in patients undergoing major surgery, GI surgery ,Urological surgery ,Orthopedic surgery , Gynecologic surgery ,thoracic and breast surgery. Knowing and practicing ERAS protocol decreases post op complications, reduce cost for patient and hospital and improves patient outcome by reducing mortality and morbidity of surgical patients.

Components of ERAS includes

Preoperatively; patient education, avoidance of prolonged fasting, opioid sparing analgesia

Intra operatively; use of minimal invasive procedures ,antibiotic prophylaxis 30-60 min before surgical incision ,use of short acting anesthetic agent (inhalation/IV) agents during induction and maintenance of GA ,avoidance of fluid overload ,lung protective MV ,maintenance of normothermia ,multimodal antiemetic prophylaxis ,multimodal opioid sparing pain management

Postoperative; rescue therapy for PONV ,procedure specific multimodal opioid sparing analgesia ,resumption of oral feeding as soon as feasible and early post operative mobilization and physical therapy

1.2. Statement of the problem

The component of ERAS includes patient education, no fasting, optimal fluid management, no bowel preparation, decreased tube use, opioid-sparing analgesia, regional anesthesia, PONV prophylaxis, antibiotic before incision and thrombo-prophylaxis, and early mobilization and early feeding. All elements of the ERAS components play an important role in decreasing patient mortality morbidity and length of hospital stay.

Prolonged fasting before and after surgery has traditionally been routine for surgical patients. This practice was combined with the administration of excessive fluids intra-operatively, and

was originally intended to decrease the likelihood of aspiration, to combat dehydration, and to protect from complications such as renal failure. But 400ml of carbohydrate containing fluids can be administered to the patient 2- 3 hrs. prior to surgery has shown to reduce preoperative hunger, thrust and anxiety.

In the same manner, as one of the peri-operative protocolized tasks in the Japan, a study showed that shortening postoperative fasting is related with reduced length of postoperative hospital stay without adversely affecting morbidity, indicating that giving high caloric diet immediately on postoperative day 1 will prevent in tissue break down and fatigability.

The other component of the ERAS protocol is concerning fluids. Administering too much or less fluid may lead patient to different complications. The former may lead to bowel edema and increased interstitial lung water, which can also lead to complications, and the latter can cause hypoperfusion of vital organs and the bowel, which can also result to complications.

Mechanical bowel preparation prior to surgery has similarly been a routine practice in traditional surgical practice, but eliminating stool by means of cathartics has not been shown to change patient outcomes. There is no evidence that mechanical bowel preparation (MBP) decreases complications such as anastomotic leakage or wound infection. Even though some studies shown that patients receiving MBP have higher incidence of spillage of bowel contents and complications, and also it is associated with side effects like dehydration, electrolyte disturbances and patient discomfort.

Therefore its routine use is not recommended in colon and other major abdominal surgeries, except for rectal surgery.

All intra-abdominal surgical procedures, even minimally invasive, are followed by a transient episode of gastrointestinal hypo- motility making postoperative illus (POI) a common clinical phenomenon after abdominal surgery. However, POI clearly has a significant impact on patient morbidity and results in a prolonged hospital stay and significantly contributes to annual healthcare costs. Implementation of fast-track colorectal surgical programs have already shown promising results in reducing overall hospital stay by epidural analgesia, earlier nutrition, and mobilization after surgery.

Intraoperative components involve minimally invasive surgery, goal directed fluid therapy, regional anesthesia, PONV prophylaxis, antibiotic before incision and thromboprophylaxis.

Postoperative components include early feeding and mobilization, optimum fluid and analgesic regimen, no NG or urinary catheter and multimodal analgesia with no opioid use as much as possible. Failure to implement those things mentioned above will directly or indirectly has a great impact on patient outcome.

1.3. Significance of the study

To assess knowledge ,attitude and practice of ERAS protocol among HCWs so that it will help to identify any gap and work on that ,knowing and practicing ERAS protocol decreases post op complications ,reduce cost for patient and hospital and improves patient outcome. Furthermore, the result can be used as a source for further prospective studies.

2. Literature review

Enhanced recovery programs are evidence-based protocols designed to standardize medical care, improve outcomes, and lower health care costs. These protocols include evidence-based techniques to minimize surgical trauma and postoperative pain, reduce complications, improve outcomes, and decrease hospital length of stay, while expediting recovery following elective procedures.

Multimodal enhanced recovery after surgery (ERAS) is an integrated, multidisciplinary approach that requires participation and commitment from the patient, surgeons, anesthesiologists, pain specialists, nursing staff, physical and occupational therapists, social services, and hospital administration (1,2). Initially, ERAS protocols converted many operations performed as inpatient to outpatient "day surgery" procedures. As experience developed with these protocols, principles of enhanced recovery were applied to increasingly complex procedures to reduce hospital length of stay and expedite return to baseline health and functional status (2,3).

ERAS protocols have been developed for colorectal surgery patients to reduce physiological stress and postoperative organ dysfunction through optimization of perioperative care and recovery (2, 4). Typically, such protocols include perioperative opioid-sparing analgesia, a laparoscopic approach for the colorectal resection, avoidance of nasogastric tubes and peritoneal drains, aggressive management of postoperative nausea and vomiting, and early oral feedings and ambulation (5). The goals of enhanced recovery after surgery (ERAS) protocols include attenuating the surgical stress response and reducing end organ dysfunction through integrated preoperative, intraoperative, and postoperative pathways. Discharge criteria with ERAS are similar to those of traditional care, but patients receiving ERAS care meet these discharge criteria sooner (1, 2)

ERAS protocols typically include 15 to 20 elements or components combined to form a multimodal pathway. These elements span through the continuum of the preoperative, intraoperative, and postoperative periods. Separately, individual elements result in modest gains, but when used together in a complementary fashion, they can decrease postoperative stress responses, thereby reducing duration of postoperative ileus, surgical complications, incisional pain, recovery time, and length of hospital stay (1, 2).

Preoperative component of ERAS protocol involves patient counseling and education, preoperative evaluation and optimization, routine investigations, admission one day before surgery, oral carbohydrate loading, and use of techniques to minimize preoperative fasting, bowel preparation, fluid overload, invasive procedure and smoking cessation (4, 9, and 13).

Patient education is important part of ERAS program. Its aim is to educate the patient about the program, to set practical expectations for post op recovery, and to psychologically prepare the patient and family members for the program. (4)

An informed, prepared, physiologically optimized patient is the goal of preoperative patient education and counseling (4, 13).

The information can be given to patients both verbally and in written form. But most of the time the information provided is verbal (11).Written information should provide detailed explanation of the procedure along with goals for post op recovery to diminish fear and anxiety and facilitate early post op recovery (4).Patient education and counseling can be performed by different group of health professional. It can be provided by nurses (13, 14), anesthesia care provider and surgeons (3, 15).

Preoperative evaluation have importance to the evaluation and optimization of chronic diseases like cardiovascular diseases, DM, anemia and the help with smoking cessation and optimization of nutritional status (4, 14). Cessation of cigarette smoking at least for one month prior to surgery reduces risk of major pulmonary complications and wound infection (4, 13).

Oral carbohydrate administration has shown to reduce preoperative hunger, thrust and anxiety.400ml of carbohydrate containing fluids can be administered to the patient 2- 3 hrs prior to surgery (1-3).

Regarding bowel preparation: multiple meta-analysis and RCTs showed that it is safe to abandon MBP. largest RCT from Denmark was published in 2007 had an objective of assessing the outcome of elective colorectal resections with and without MBP and found no difference in anastomotic leak ,septic complication ,fascial dehiscence and mortality.in addition to absence of benefit MBP was associated with side effects like dehydration, electrolyte disturbances ,patient discomfort and anastomotic leak(6) .

Optimal perioperative fluid management is an important component of Enhanced Recovery after Surgery pathways. Fluid management within ERAS should be viewed as a continuum through the preoperative, intraoperative, and postoperative phases. Each phase is important for improving patient outcomes, and suboptimal care in one phase can undermine best practice within the rest of the ERAS pathway. The goal of preoperative fluid management is for the patient to arrive in the operating room in a hydrated and euvolemic state. As part of this plan, excess crystalloid should be avoided in all patients. For most patients undergoing major surgery, individualized goal-directed fluid therapy (GDFT) is recommended (7).

In a Cochrane review on antibiotic prophylaxis in colorectal surgery, the authors concluded that the use of antibiotic prophylaxis for patients undergoing colorectal surgery is imperative to reduce the risk of surgical-site infections. For intravenous antibiotics accepted administration is 30–60 min before skin incision (8).

There are no RCTs comparing general anesthetic techniques for colorectal surgery. It makes good sense to use short-acting induction agents such as propofol combined with a short-acting opioid like fentanyl, alfentanil or a remifentanil infusion. Short-acting muscle relaxants can be titrated using neuromuscular monitoring.

Anesthetic techniques are selected to provide optimal operating conditions with consistent and rapid recovery of cognition and physical functions such as ambulation and oral intake, ideally with minimal or no adverse effect, low postoperative complications such as PONV and hemodynamic disturbance should be given. Peripheral nerve block, mid-thoracic epidural, spinal anesthesia and low-dose opioids should be considered for open surgery (8).

Temperature control — Core body temperature is routinely monitored at the esophageal or nasopharyngeal site and warming devices are employed to maintain normothermia (temperature ≥35.5°C). These include upper- and lower-body forced-air warming devices and blankets, insulation water mattresses, and devices for warming all IV fluids. Hypothermia is avoided because of potential complications (eg, shivering, coagulopathy, prolonged duration of stay in the post-anesthesia care unit, surgical site infection, adverse cardiac events) [9]. Postoperative hypothermia is most likely to occur when procedures are longer than two hours, and in older patients or those who have comorbid illness or little body fat.

Although patients may develop abdominal distension or vomiting without a nasogastric tube, this is not associated with an increase in complications or length of stay. Fore very patient requiring insertion of a nasogastric tube in the postoperative period, at least 20 patients will not require nasogastric decompression. Routine nasogastric decompression is not supported.

The increased risk of anastomosis leak for early start of feeding after bowel surgeries is well investigated and showed that the impact of early start of enteral feeding on anastomosis leak is not evidence based (10).

Even though there are a lot determinant factors that will enable the surgical patients for early postoperative mobilization, adequate pain relief should be ensured to fasten ambulation. It has been shown that early mobilization after adequate pain control helps the patient to mobilize and prevent venous thrombo-embolic complication.(16)

There is a scarcity of research done on assessment of knowledge attitude and practice of ERAS on healthcare professionals, unpublished study done at GondarUniversity showed that anesthetists have scored the highest on the knowledge questions, good practice and positive attitude (18)

A study conducted in Ohio state university also reported only 35% of participants affiliated with Anesthesiology reported that they knew much about ERAS (19)

3 Objectives

3.1 General objective

To assess Knowledge attitude and practice of ERAS on HCPs at TASH, Addis Ababa, Ethiopia during data collection time

3.2 Specific objectives

To assess knowledge of Anesthetists, Anesthesiologists, Surgeons, Surgical residents, Anesthesiology residents and nurses towards ERAS

To assess attitude of Anesthetists, Anesthesiologists, Surgeons, Surgical residents, Anesthesiology residents and nurses towards ERAS

To assess practice of ERAS among Anesthetists, Anesthesiologists, Surgeons, Surgical residents, Anesthesiology residents and nurses.

4 .Methods and Materials

4.1 Study area and Period

The study was conducted at TikurAnbesa Specialized Hospital in Addis Ababa, Ethiopia. It is one of the biggest hospitals in the country and serves for patients coming from four corners of the country. Currently TASH gives surgical services in the following departments: Neurosurgery, Cardio-Thoracic surgery, Pediatric surgery, Urological surgery, ENT and orthopedic surgery, Gastro intestinal tract surgery, Obstetrics and Gynecology surgery. Anesthesia services are provided by the department of Anesthesiology Critical care and Pain medicine and anesthesia department. The study was conducted from May –October 2021 G.C. at TASH Addis Ababa, Ethiopia.

4.2. Study design

Institutional based quantitative cross sectional prospective observational study was employed

4.3. Source population

All Anesthetists, Anesthesiologists, Surgeons, Surgical residents, Anesthesiology residents and nurses working at TASH surgical wards and OR.

4.4. Study Population

All Anesthetists, Anesthesiologists, Surgeons, Surgical residents, Anesthesiology residents and nurses working at TASH surgical wards and OR during study period

4.5 Study unit and study tool

Individuals and structured questionnaire

4.6. Sample size determination

The actual sample size for the study determined by using single population proportion formula

$$n = \frac{(Z)^2 \times p(1-p)}{d^{2s}}$$

Where n = desired sample size = since sample size is <10000 using

Z = Confidence level =(95%) correction formula

P = population proportion (50%) $)nf = \frac{ni}{1+ni/N}$

d = marginal error (5%)

So n = $\frac{(1.96)^2 \times 0.5\ (1-0.5)}{(0.05)^2}$ =384.16 =384 nf=384/(1+384/758) =256

4.7. Sampling Procedure

All Anesthetists, Anesthesiologists, Surgeons, Surgical residents, Anesthesiology residents and nurses working at TASH surgical wards and OR.

4.8. Data Collection

A structured questionnaire was developed that addressed socio-demographic variables, working department, status or qualifications, year of experience, knowledge, attitude and practice of participants about enhanced recovery after surgery. Two Nurses and Anesthesia residents was recruited and participate throughout the data collection and after training for one day by the principal investigator on the study instrument and data collection procedures. The questionnaire was handed over to the respondents in person and collected by the principal investigator.

4.9. Data Entry and Analysis

After completeness of collection, data were crosschecked manually entered using Epidata V 4.6 and imported and analyzed using SPSS version 25. Descriptive analysis, including means and standard deviations of continuous variables and frequencies and percentages of categorical variables, were calculated to describe the sample. Multivariate logistic regression has been utilized to assess the association between good knowledge, attitude, practice and participant's age, work experience, level of education. P-values <0.05were considered to be statistically significant.

4.10. Ethical Issues

Ethical clearance obtained from the department of Anesthesiology critical care and pain medicine. The aim of the study was clearly explained to the study participants. Information was collected after obtaining informed written consent from each participant. The personal

information of study participants was kept entirely anonymous, and confidentiality was assured throughout the study period and the data will be used only for the intended purpose of the study.

4.11. Eligibility Criteria

4.11.1. Inclusion Criteria

All Anesthetists, Surgeons, Anesthesiology residents, Surgical residents, Anesthesiologists and nurses working in TASH during the study period were included.

4.11.2 Exclusion criteria

Those professionals who were not willing to participate in the study.
Those professionals who were not present during data collection period

4.12. Study Variables

4.12.1 Dependent variables (outcome variable):

Knowledge attitude and practice of ERAS

4.12.2. Independent variables:

- Demographic characteristics: Age, Gender, Level of education, Years of working experience.
- Health care provider factors: Belief, type of profession , training, access to article
- Organizational factors: Protocols of the hospital, Pain management guidelines, Availability of drugs

4.13. Operational definitions

Good knowledge: participants who answer above the mean of Knowledge questions are considered as having good knowledge.

Poor knowledge: participants who answer below the mean of the Knowledge questions are considered as having poor knowledge.

Positive attitude: participants who answer above the mean of attitude questions are considered as having positive attitude.

Negative attitude: participants who answer below the mean of the attitude questions are considered as having Negative attitude.

Good practice: participants who answer above the mean of practice questions are considered as having good practice.

Poor practice: participants who answer below the mean of practice questions are considered as having poor practice.

ACCPM team: Anesthesiology critical care and pain medicine resident and Anesthesiologists

Surgical team: Surgeons and surgical resident

4.14 Result dissemination

The study result will be submitted to Addis Ababa University School of medicine and be presented to the health science community and disseminated to the concerned and the result will be published on peer reviewed scientific journal.

5. Result

Characteristics of study participants

A total of 256 health care professionals was approached, 236 had participated. This yields to a response rate of 92% and non-response rate of 8%. Two participants have been removed from the analysis due to a high number of missing data.

Table 2 shows the characteristics of study participants. The proportions of male participants were higher than female study participants (70.34% Vs 29.66%). More than half of the study participants (67.65 %) have 1 – 5 years of work experience. The majority of the study participants (65.97%) belong to the age group of 20-30 years old. Among study participants 34.03 % were surgical residents; however, only 5.04 % were surgeons.

Table 2: Characteristics of study participants, among health care professionals at Tikur Anbesa specialized hospital, Addis Ababa, Ethiopia in 2021 (N=236)

Characteristics	n	Percent (%)
Age (years)		
20-30	154	65.97
31-40	52	21.43
41-50	14	8.52
+50	16	10.08
Sex		
Male	166	70.34
Female	70	29.66
Level of education		
Anesthesiologist	12	5.04
Anesthesiology resident	42	17.65
Anesthetist	37	16.39
Nurse	52	21.85
Surgeon	12	5.04
Surgical resident	81	34.03
Work experience (Years)		
1-5	161	67.65
6-10	35	14.71
+10	40	17.65

Knowledge towards ERAS Protocols

Figure 1 and 2 shows the knowledge of study participants towards ERAS. More than half of the study participants have good knowledge about ERAS Protocols. Almost all ACCPM has good knowledge (90.7%) on ERAS Protocols; on the other hand, only 21 % of nurses have good knowledge. Those with work experience of 1-5 years have the highest proportion of participants with good knowledge about ERAS. The proportion of participants with good knowledge seems to decrease with an increase in years of work experience.

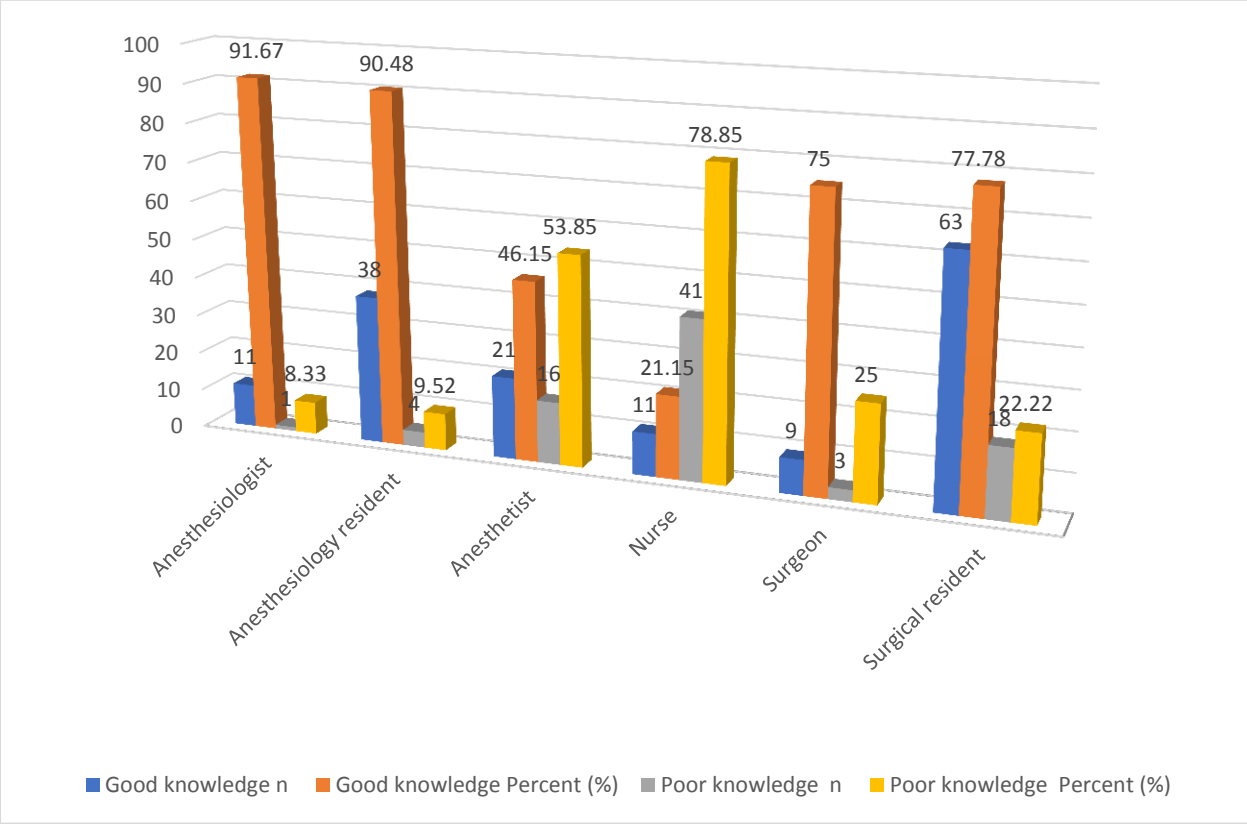

Figure 1: Knowledge of study participants towards ERAS Protocols among health care professionals at Tikur Anbesa specialized hospital, Addis Ababa, Ethiopia in 2021 (N=236)

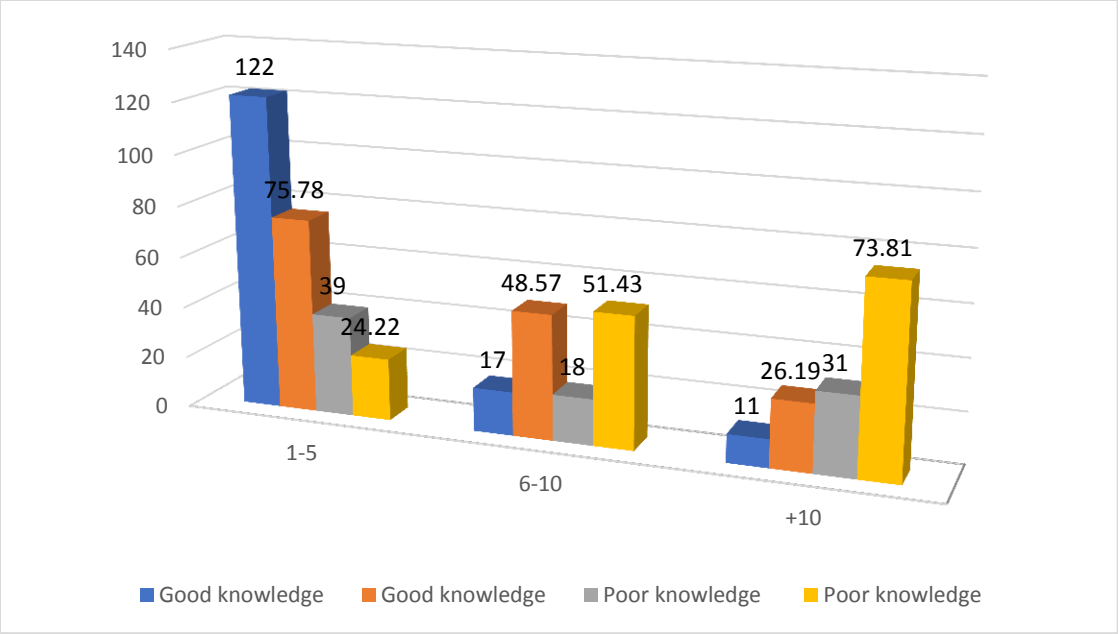

Figure 2: Knowledge of study participants by years of work experience ERAS Protocols

Table 3: The comparison of level of knowledge of study participants by level of education, among health care professionals at Tikur Anbesa specialized hospital, Addis Ababa, Ethiopia in 2021 (N=236).

	Good knowledge		Poor knowledge	
Characteristics	n	Percent (%)	n	Percent (%)
Level of education				
ACCPM team (Anesthesiologist,ACCPM residents)	48	90.74	6	9.26
Surgical team (surgeon,Surgical residents)	72	77.24	21	22.58
Anesthetist	21	46.15	16	53.85
Nurse	11	21.15	41	78.85
Total	150	63.03	86	63.97

Table 4 show the association between good knowledge and participants characteristics. Those with age group of 20-30 years are 4.19 times more likely to have good knowledge compared to those who are with in age group of 50 and above years(AOR=4.19;95% CI1.09-16.08;P value 0.036). As compared to ACCPM, anesthetists and nurses had poor knowledge 0.09and 0.032 times with P =0.00(AOR, 0.091; 95% CI 0.02-0.29) and P=0.000 AOR, 0.032; 95% CI 0.08-0.12) respectively.

Table 4 Logistic regression showing the association between good knowledge and age, level of education and work experience among health care professionals at Tikur Anbessa specialised hospital, Addis Ababa, Ethiopia,2021.

Characteristics	Knowledge		P value	COR(95% CI)	P value	AOR(95%CI)
	Good	Poor				
Age (years)						
20-30	117(75%)	39(25%)	0.036	4.19(1.09-16.08)	**0.036**	**4.19(1.09-16.08)**
31-40	25(49%)	26(51%)	0.074	3.58(0.88- 14.5)	0.074	3.58(0.88-14.50)
41-50	8(56%)	6(44%)	0.471	2.68(0.18- 39.2)	0.474	2.68(0.18-39.27)
+50	7(36%)	10(64%)		1		
Work experience						
1-5	121(75%)	39(25%)	0.153	8.46 (3.88-18.44)	0.112	2.32(0.82-6.57)
6-10	17(48%)	18(52%)	0.302	2.57(0.98-6.70)	0.048	3.40(2.10- 11.41)
>10	11(26%)	30(74%)	-	1		1
Level of education						
ACCPM	48 (90%)	6(10%)		1		1
Surgical team	72(77%)	21(23%)	0.048	0.392(0.123-0.99)	0.068	0.365(0.12-1.07)
Anesthetist	17(45%)	20(55%)	0.00	086(0.028-0.267	**0.000**	**0.091(0.02-0.29)**
Nurse	11(21%)	41(79%)	0.00	0.27(0.008-0.085)	**0.000**	**0.032(0.08-0.12)**

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Attitude towards ERAS Protocols

Table 5 shows the attitude of study participants towards ERAS Protocols. Most of ACCPM (85%) and surgical team (83%) have good attitude about ERAS. On the contrary, only 15% of nurses have a positive attitude about ERAS. Study participants with work experience of 1-5 years have the highest proportion of participants with positive attitude. In addition, the results reviled that positive attitude towards ERAS decrease with the increase in study participants work experience.

Table 5: logistic regression showing the association between positive attitude and age ,work experience and level of education among health care professionals at Tikur Anbessa specialised hospital, Addis Ababa, Ethiopia,2021.N=236

Characteristics	Attitude		P value	COR(95%CI)	P value	AOR(95% CI)
	Positive	Negative				
Age (years)						
20-30	116(74%)	40(36%)	0.04	3.77(1.53-9.26)	0.154	2.60(0.69-9.60)
31-40	32(62%)	19(38%)	0.125	2.18(0.80-5.90)	**0.039**	**4.14(1.07-15.00)**
41-50	6(42%)	8(58%)	0.775	1.30(0.21-7.80)	0.374	3.04(0.26-35.00)
+50	10(47%)	11(53%)	-			
Work experience						
1-5	117(73%)	43(27%)	0.037	2.1(1.0-4.30)	0.153	0.41(0.12-1.38)
6-10	21(60%)	14(40%)	0.731	1.17(0.47-2.90)	0.302	1.93(0.55-6.77)
>10	23(56%)	18(44%)	0.436	1.27(0.68-2.30)	-	1
Level of education						
ACCPM	48(85%)	8(15%)	-			1
Surgical team	78(83%)	15(17%)	0.710	1.18(0.48-2.85)	0.921	1.04(0.42-2.56)
Anesthetist	24(64%)	13(36%)	0.070	0.41(0.16-1.09)	**0.028**	**0.31(0.11-0.88)**
Nurse	15(28%)	37(72%)	0.000	0.09(0.03-0.22)	**0.00**	**0.03(0.07-0.12)**

Regarding attitude towards ERAS, health care workers in the age group 31-40 has four times positive attitude as compared health workers in the age group above 50 years old(p= 0.039, AOR 4.14 95% CI (1.07-15.00).

Nurses and anesthetists have negative attitude towards ERAS as compared to ACCPM with p=0.00, AOR 0.03 95%CI (0.07-0.12) and p =0.028 AOR 0.31 95%CI (0.11-0.88) respectively.

The practice of ERAS Protocols

The majority of ACCPM (70%) and surgical team (58%) have good practice of ERAS. However, only 36% of nurses have good practice about ERAS. Study participants with work experience of 1-5 years have the highest proportion of participants with good practice.

Table 6: logistic regression showing the association between good practice and age , work experience and level of education among health care professionals at Tikur Anbessa specialised hospital, Addis Ababa, Ethiopia,2021.N=236

Characteristics	Practice		P value	COR	P value	AOR 95% CI
	Good	Poor				
Age (years)						
20-30	88(56%)	68(44%)	0.001	13.50(3.0-5.90)	0.05	9.70(1.90-4.80)
31-40	30(58%)	21(42%)	0.001	15.00(3.17-7.00)	**0.001**	**7.3(3.40-8.80)**
41-50	6(42%)	8(58%)	0.003	52.5(3.90-7.00)	**0.001**	**8.00(5.50-11.0)**
+50	6(22%)	21(78%)	-			
Work experience						
1-5	93(58%)	67(42%)	0.058	1.95(0.97-3.90)	0.93	1.04(0.39-2.70)
6-10	15(42%)	20(58%)	0.902	1.05(0.42-8.00)	0.86	0.90(0.30-2.60)
>10	17(40%)	24(60%)	-			
Level of education						
ACCPM	38(70%)	16(30%)		1		
Surgical team	54(58%)	39(42%)	0.42	0.75(0.37-1.5.)	0.34	0.70(0.34-1.45)
Anesthetist	16(43%)	21(57%)	0.07	0.46(0.19-1.08)	0.15	0.50(0.20-1.20)
Nurse	19(36%)	33(64%)	0.004	0.31(0.14-0.69)	**0.012**	**0.25()0.08-0.74)**

Regarding practice of ERAS, health care workers in the age group 31-40 and 41-50 has 7 times and 8 times likely to have good practice as compared to health care workers above 50 years old with P=0.00, AOR 7.3(3.40-8.80) and P =0.001 AOR 8.00(5.50-11.0) respectively.

Nurses have poor practice as compared to ACCPM, P=0.012 AOR 0.25(0.08-0.74)

6. Discussion

For improved post-operative recovery and the successful implementation of the ERAS protocol, the healthcare team, must be well-versed in ERAS. It has been reported in the literature that there are gaps in healthcare professional training regarding ERAS protocols and their implementation. (17) Hence this study was conducted with the aim of assessing the knowledge attitude and practice of to assess knowledge attitude and practice of selected health care professionals about ERAS at TASH, Addis Ababa, Ethiopia. Findings from this study revealed that more than half of study participants have good knowledge, positive attitude, and good practice of ERAS. However, a significant number of study participants have poor knowledge, negative attitude, and poor practice of ERAS. This study shows that majority of surgical and anesthesiology resident residents have good knowledge, a positive attitude, and good practice of ERAS. Moreover, it has been observed that participant's knowledge, attitude, and practice of ERAS decline with their increase in work experience (years).

This study shows that 63.03 % of study participants have good knowledge on ERAS. Among the study participants ACCPM have the highest proportion of those with good knowledge on ERAS. However, a similar unpublished study done at Gondar University showed that anesthetists have scored the highest on the knowledge questions. (18) However, in both studies, nurses have scored the lowest when compared to their counterpanes. This difference in knowledge score among different professions might reflect the variation of a portion that has been allocated to ERAS on the curriculum and continuous professional development activities. In addition, a similar study reports no departmental differences were noted for the remaining knowledge and perception survey questions. This discrepancy in with our findings might arise from the difference in formal education and continuous professional development activities associated with these health care facilities. (19) Moreover, it has been observed the increase in work experience might lead to a lower knowledge score. This might reflect that since ERAS in relatively newly developed protocol/ concept those professional with numbers years of experience might acquire knowledge about ERAS protocol through their formal education. This finding indicates the need for continuous professional development activities containing ERAS as a major component. A similar study conducted in Ohio state university also reported only 35% of participants affiliated with Anesthesiology reported that they knew much about ERAS. (19)

The other major finding of this study is that 67.65 % and 32.35 % of study participants have a positive attitude and negative attitude respectively. ACCPM and surgical team represent the highest portion of study participants with a positive attitude .This might be due to the fact that they have good knowledge and been exposed to the ERAS protocol and advantages accosted with its effective implementation. However, a study done at Gondar University has reported that anesthetists to have the highest proportion with a positive attitude. (18) This difference might be due to the different types of a heath care professional that has been included in these studies.

More than half of the study participants have good practice of ERAS. The highest proportions of ACCPM (70%) and surgical team (58%) have good practice of ERAS. This could be because ACCPM have good knowledge to the ERAS protocol and the benefits that come with its effective implementation.

7. Strength and limitation of the study

The findings of this study should be interpreted in light of these limitations. Due to the scarcity of literature on knowledge attitude and practice of health care professions on ERAS, it was not possible to compare and contrast the study finding and put it in perspective. Moreover, due to the relatively small number of participants included in this study we were not able to examine factors that lead to good knowledge, positive attitude, and good practice. The major strength of this study is to identify and try to fill the scarcity of evidence on the knowledge, attitude, and practice about ERAS.

8. Conclusion

Based on these findings I conclude that more than half of study participants have good knowledge, positive attitude and good practice of ERAS protocol. However, nurses have shown the lowest score in knowledge attitude and practice of ERAS.

9. Recommendation

Clinicians should implement the ERAS protocol appropriately. In addition, training and continuous professional development activities on ERAS practices should be designed and implemented particularly targeting those with work experience of greater than five years, nurses, and surgeons. Moreover, a multidisciplinary group approach should be taken when implicating the ERAS protocol to facilitate effectiveness and learning environment for those that didn’t achieve optimal knowledge attitude and practice of ERAS protocol.

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Questionnaires 1: Subject information sheet

Addis Ababa University

School of medicine

Subject information sheet

Hello, my name is ----------, I am here in behalf of Dr. Getu Ashagrie., a student in Addis Ababa University School of medicine, department of anesthesiology, critical care and pain medicine. He is conducting a research thesis on "Assessment of Knowledge attitude and practice of ERAS on HCPs Anesthetist, Anesthesiologists, Anesthesiology residents, surgical residents, surgeons and nurses at Tikur Anbesa Specialized Hospital, Addis Ababa, Ethiopia, 2021". He had got formal permission from Addis Ababa University School of medicine and TikurAnbesa Specialized Hospital officials to conduct the study.

You are selected to participate in this study. There will be no direct benefit by participating in this study, but in future information gathered by this study will helps policy makers, programmers and researchers to give appropriate attention on issues of interest and design specific treatment options.

The information will be kept confidential by using only code numbers and locking the data. Only the members of the study team will have the access to the non-coded data and the data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study.

If you need any further information or explanation regarding to the study, you can have this address to contact.

Name: Dr. Getu Ashagrie. Tel- +251-918449516 Email- getuabebaw@gmail.com

The survey will take about 10 minutes to fill this

questionnaire. Would you be willing to participate.[put''x''mark]

Yes----------

No----------

Part 1

S.N	Questions related to Socio demographic data	
101	Age	----------Year
102	Sex	1.Male 2.female
103	What is your religion	1.orthodox Christian 2.Muslim 3.Protestant 4.Adventist 5.other specify----------
104	What is your marital status	1.Single 2.Married 3.Divorced 4. Widow

105	What is your work experience?	---------- year
106	What is your current level of education?	a)Anesthetist b)Nurse c)Anesthesiologist d)Surgical resident(specify) e) Anesthesiology resident f)Surgeon

Part II: **Questions related to knowledge about ERAS protocol**

S.N		
201	What patients are selected for Enhanced recovery after surgery?	a) Elective procedures b) Emergency procedures c) Day case surgeries d) All types of procedures
202	Who do you think should involve in Enhanced Recovery after Surgery (ERAS) program?	a) The anesthetist b) The surgeon c) The intern d) Nursing staff e) Informed Patient attendant f) Nutritionist (if any) g) Physical therapist (if any) h) All in collaboration
203	What are the components of Enhanced recovery after surgery?	a) Detailed preoperative evaluation & surgery? optimization of the patient b) Adequate Intraoperative fluid & pain management c) Post op follow up d) The summation of all

204	During open surgery which approach do you think is preferable for fast tracking?	a) Vertical incision b) Transverse incision
205	During abdominal surgery which approach do you think is preferable for fast tracking?	a) Open approach b) Laparoscopic approach c) Both has the same effect d) Not my task
206	When do you think giving Prophylactic antibiotics has better effect?	a) 30-60 minute before the procedure b) Immediately before skin incision c) Immediately after surgery d) Not important at all e) Not my task
207	Which type of anesthetic technique is better for enhanced recovery after surgery?	a) General anesthesia b) Regional anesthesia c) Both has the same effect d) Not my task
208	Which pain management technique has fewer roles in ERAS after colorectal surgery?	a) Lower thoracic epidural analgesia b) Plain abdominal field block c) Non-opiate analgesic/NSAIDs d) Strong opioids e) Not my task
209	Which induction anesthetic drug do you think is recommended for fast track surgery? (good choice)	a) Ketamine b) Propofol c) Thiopental d) Not my task
210	Concerning NPO time, which one of the following is true	a) Loading carbohydrate fluids 2 hr prior to surgery is important b) Patient should stay NPO for 6hr from solid foods c) all d) not my task

211	Regarding fluid management of surgical patient according to ERAS protocol	a) goal-directed fluid therapy enhance recovery after surgery b) giving more fluids more than the calculated dose fasten post op recovery c) fluids should be restricted to enhance recovery d) not my task
212	Which one of the following is the component of ERAS protocol?	a) pain management b) fluid management c) early removal of catheters and tubes d) all
213	Do you think preventing hypothermia has role in enhancing recovery after surgery?	a) Yes b) No c) Not my task
214	Do you believe that the use of regional anesthesia reduces length of hospital stay than general anesthesia?	a) Yes b) No c) Not my task
215	Do you think that the practice of minimally invasive operations or laparoscopic procedure has less risk of post operative complication than the same procedure performed in open fashion?	a) Yes b) No c) Not my task
216	Which of the following do you think is useful	a) Excessive fluid administrations to prevent post operative delayed bowel motility or ileus b) Use of long acting opioids c) Post operative gum chewing d) Not my task
217	Do you think that advocating early oral feeding and dietary supplementation fasten post operative recovery?	a) Yes b) No c) Not my task

Part I11, questions related to attitude

	Questions	Strongly Agree	Agree	Strongly disagree	Disagree	No comment
301	Enhanced recovery after surgery protocol will improve patient out come					
302	Good communication and team working has great impact for better patient out come					
303	Preoperative patient counseling and optimization improve postoperative out comes and fasten recovery					
304	Mechanical bowel preparation for three days has greater advantage than using chemical ones in decreasing post operative complications					
305	Post operative gum chewing decrease the likelihood of developing ileus					
306	Managing pain on PRN base is not effective as using on regular daily dose.					
307	Goal directed fluid management has a better outcome for patient recovery than using the liberal or standard fluid management technique					
308	Full mobilization on the first postoperative day (getting out of bed, going to toilette, walking along the corridor) facilitate early recovery and discharge					
309	Avoiding use of NGT and drains or early removal will fasten recovery					
310	Giving oral Carb fluids 2-3 hrs before operation is beneficial for early recovery					

Part IV, questions related to Practice

	Questions	Routinely	Often	Sometimes	Seldom	No comment
401	Do you practice multimodal pain management					
402	Do you practice Good communication and team working?					
403	Do you practice Preoperative patient counseling and optimization?					
404	Do you practice Mechanical bowel preparation for three days?					
405	Do you recommend Post-operative gum chewing?					
406	Do you routinely use multimodal antiemetic prophylaxis in all patients?					
407	Do you practice goal directed fluid management?					
408	Do you recommend early mobilization on the first postoperative day (getting out of bed, going to toilette, walking along the corridor) to facilitate early recovery and discharge					
409	Do you avoid use of naso-gastric tube and drains or early removal will fasten recovery					
410	Do you give oral carbohydrate fluids 2-3 hrs before operation and is it beneficial for early recovery					

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