Knowledge, compliance and barriers to implementation of ERAS Guidelines by General Surgeons and Residents in Kenyatta National Hospital

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H58/6908/2017

A dissertation presented in part fulfillment of the requirements for the award of the degree of Master of Medicine in General Surgery at the University of Nairobi.

April 2022

Declaration

This dissertation is my original work and has not been submitted either wholly or in part at any other institution for any academic award. Where work by other authors is quoted, it has been appropriately referenced.

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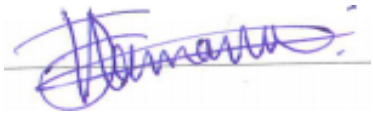
Signed: 

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List of Abbreviations

ANOVA:	Analysis of Variance
ASOS:	African Surgical Outcomes Study
CME	Continuous Medical Education
ENT:	Ear Nose and Throat (Otorhinolaryngology)
ERAS:	Enhanced Recovery After Surgery
ERC:	Ethics and Research Committee
GS:	General Surgery
HOD:	Head of Department
IFN:	Interferon
IL:	Interleukin
KNH:	Kenyatta National Hospital
PRAS:	Plastic, Reconstructive and Aesthetic Surgery
RCT:	Randomized Control Trial
SPSS:	Statistical Package for Social Sciences
TCVS:	Thoracic and Cardiovascular Surgery
TNF:	Tumor Necrosis Factor
UoN:	University of Nairobi
WHO:	World Health Organization

Operational definitions of Terms

Compliance: Adherence to the guidelines in the ERAS Protocol by implementing specific elements as spelt out.

Barriers: Any factor, perception or situation that creates a hindrance to the full and effective implementation of an element in the ERAS Protocol.

Fast-track surgery: Refers to the care pathways followed in ERAS Protocol to accelerate post-operative recovery

Perioperative: This refers to the period or events from the time a decision is made to perform a surgical operation on a given patient up to the moment that in-hospital post-operative care in the initial setting is concluded by discharge from hospital.

Morbidity: As used in the context of this study, this refers to any adverse events, complications or untoward prolongation of duration of stay occasioned by unintended outcomes resulting from the surgery and occurring during the primary admission.

Patient outcome: Effects of the surgical health care provided on the health status of the patient.

Abstract

Background

Enhanced Recovery after Surgery (ERAS) Protocol is a set of evidence-based guidelines on perioperative care using a multimodal and multidisciplinary approach at all the phases of surgical care from the pre-admission stage until discharge from hospital. These guidelines are aimed at minimizing surgical stress and accelerating recovery, thus optimizing patient outcomes and lowering the cost of health care. The protocol has been tried and tested globally and found to significantly improve perioperative outcomes and reduce the duration of hospitalization. Subsequently, it has been adopted universally as a means of reducing perioperative morbidity. Despite its adoption in Kenyatta National Hospital (KNH) General Surgery unit four years ago, the compliance to its elements and the hindrances to its effective implementation have not been interrogated.

Objective

To assess the knowledge, evaluate self-reported compliance and determine perceived barriers to implementation of ERAS guidelines by general surgeons and their residents in KNH.

Methodology

This was a descriptive cross-sectional study carried out at the KNH General Surgery unit among consultant general surgeons and surgery residents providing surgical care in KNH General Surgery wards. It was a census study. A structured, self-administered two-part online questionnaire was used to collect the data. Independent variables are the demographics of respondents, while the dependent variables are the scores on Knowledge, Compliance and Barriers identified. Descriptive statistics such as means, SD, medians and ranges were used to describe the characteristics of the study participants and their responses. For statistical analysis and evaluation of associations, the student T-test and ANOVA tests were employed. Results were presented in pie charts, graphs, tables and plot diagrams.

Results

Most of the respondents were residents (83%), majority being in their 5^{th} year of residency (45%). Despite 98% awareness on what ERAS is, knowledge score was low at 57.7%, with preoperative elements recording lowest scores. There were no significant differences in knowledge between the demographic groups. Compliance mean score was 50.2% (SD=17), with the most affected elements including use of preoperative clear carbohydrate drinks and prehabilitation. Notably, compliance decreased across all groups with increase in seniority (by level of training and length of experience). Lack of an ERAS Coordinator and lack of Continuous Medical Education (CME) on ERAS were rated among the top barriers to implementation of ERAS protocols.

Conclusion

The findings suggest that appointment of an ERAS Coordinator and instituting CME teachings on ERAS may improve knowledge and compliance. Pre-admission nutritional optimization and adherence to pre-operative limited fasting guidelines should also be addressed. Such interventions to address the identified deficits in knowledge and compliance, and the key barriers, may improve patient outcomes and shorten hospital stay, thus lowering the cost of surgical care.

Chapter 1: Introduction

The ERAS protocol is a compilation of evidence-based guidelines on perioperative care using a multimodal and multidisciplinary approach at pre-admission, preoperative, intraoperative and postoperative phases to minimize surgical stress, accelerate recovery and optimize patient outcomes.[1]

By employing highly effective approaches to perioperative care, ERAS protocol also seeks to reduce the overall cost of surgical healthcare, mainly by reducing the length of stay. [1, 3]

This allows the realization of the ultimate aim of ERAS which is to improve the value of the care provided to both the patient, and the healthcare system as an entity. This value is evaluated, on one hand, in terms of patient-reported outcomes and surgical safety, and on the other hand in terms of the cost of healthcare. [3]

The protocol addresses the entire cycle of perioperative care of a surgical patient. This is done by dividing the cycle into the afore-mentioned four phases according to the chronological sequence of events from the time a decision to operate on the patient is made until the time a patient is discharged from in-patient care after surgery. [3]

Each of these phases involves different strategies that are not stand-alone items but are interdependent in that the elements in a particular phase actually optimize the patient for the next phase and therefore have a bearing on the effective implementation of elements in the subsequent phase. ERAS protocol elements are thus best viewed as interlinked measures to address the continuum of surgical care as a complete spectrum, rather than singular disjointed efforts. [12]

ERAS protocol consists of 24 core elements grounded on evidence-based recommendations, and grouped into the four phases along the pathway taken by the surgical patient. [1, 12] (Appendix 1)

The various elements of ERAS protocol employ different modalities such as psychological, dietary, pharmacological, physiotherapy and surgical methods, thereby making it a multimodal approach. [2, 12]

This therefore requires the contribution of different specialties for the implementation of the different elements, making it essentially a multidisciplinary tool. The ERAS team will therefore have a varied personnel mix comprising Counselors, Nutritionists, Physicians, Psychiatrists,

Anesthesiologists, Surgeons, Nurses, Enterostomal therapists, Clinical Pharmacists, Physiotherapists and Occupational therapists. [3, 12]

ERAS Protocol has been validated in several studies and shown to result in significant success regarding its impact on perioperative outcomes as described. [40, 41]

Chapter 2: Literature Review

2.1: Background

The contribution of surgery to healthcare provision is highly significant as evidenced by the proportion of the global population that seeks surgical care. This was estimated to be about 234 million people undergoing major surgery in the year 2004, translating to one in every 25 people annually.[4]

The number of people undergoing surgery would even be higher if accessibility to surgical services were optimum across the globe as evidenced by a 2006 World Bank study revealing that 11% of the global disease burden was attributable to surgically amenable ailments.[5]

With such a large fraction of the human population requiring surgery, it is imperative to interrogate the morbidity associated with surgery and hence determine how best to reduce such morbidity.

Biccard et al in the ASOS study looking at perioperative outcomes in 25 African countries reported morbidity at 18.2% for all surgeries, and 13.4% for elective surgeries, despite having patients with lower perioperative risk profile than in high-income countries.[6]

Saidi et al, in a large survey of colorectal surgeries done in KNH between 1993 and 2005, found an in-hospital morbidity rate of 27.9% for the period between 1999 and 2005.[7]

Kimani et al, in a surgical audit of patients undergoing laparotomy in general at KNH between 2006 and 2007 reported a morbidity rate of 52%.[8]

In developed countries, the figures are lower. This is seen in a study by Gawande et al that showed a perioperative morbidity of 3% in Colorado and Utah, USA.[42]

Even in areas with higher rates than this, the morbidity associated with in-patient surgery in developed countries was shown to be lower than seen with our local figures; a 2002 study done in Australia revealed a rate of 17%.[9]

The higher morbidity of surgery locally leads to high cost of healthcare, with ultimate impact on economic productivity. A systematic review by Grimes et al identified cost of surgical care as a key barrier to surgical care in low- and middle-income countries.[11]

In an effort to address perioperative morbidity and cost of care, the ERAS Study Group was formed in 2001 in Sweden by collaboration of Departments of Surgery from five countries in Northern Europe (Netherlands, Scotland, Sweden, Norway and Denmark).[2] The group published its first evidence-based consensus protocol in 2005. It transitioned in 2010 into the ERAS Society, based in Stockholm, Sweden, with protocols undergoing further updates till the current 4th update of 2018.[1]

The concept was initially applied to colorectal surgery only but has gradually been adopted for use in almost all other surgical specialties.[12] This has led to the publishing of ERAS Guidelines in Gynecology, Head and neck cancer surgery, Hip and knee replacement, Thoracic non-cardiac surgery, and esophageal resection among others.[12]

2.2: Surgical stress

Key to the mechanism of enhancing post-operative recovery is the mitigation of surgical stress. Kehlet and Wilmore in their analysis of fast-track pathways assert that the factors influencing surgical stress include pain, fatigue, nausea and vomiting, ileus, impaired pulmonary function, increased cardiac demand with altered fluid homeostasis, catabolic state, immune dysregulation, imbalance of coagulation-fibrinolytic system and cerebral dysfunction.[22]

Vigano et al report that postoperative increase in IL-6 has been correlated with the severity of tissue trauma and eventual adverse outcome.[33]

They thus aver that attenuating the neurohormonal response to surgery provides a means to minimize this stress and thus ameliorate the risk of sequelae such as organ dysfunction and complications.[22]

This was proven in a study where one of the Protocol elements, preoperative oral carbohydrate supplementation, was evaluated; Vigano et al showed that for patients receiving this, there was

less stress response as evidenced by lower: cortisol levels, insulin resistance, IL-6 levels and less postoperative infectious complications.[33]

Thus, ERAS Protocol elements were designed to tilt the balance in favor of anabolism and to counter catabolism and its attendant complications with prolonged hospitalization.[34, 35]

2.3: Utility of ERAS Protocol

Implementation of the protocol has been shown in several studies to shorten the length of hospital stay by 30 to 50%, and significantly reduce complications and the overall cost of care.[12]
A meta-analysis of RCTs by Zhuang et al showed that compared to traditional care, ERAS programs led to significant reduction in hospital stay and total complications.[13]
Another meta-analysis by Varadhan et al demonstrated similar results, with an almost 50% reduction in complication rates, but minimal reduction in re-admissions and mortality.[14]
Ren et al conducted a large RCT of 597 patients that showed reduced metabolic indices for surgical stress, faster recovery and lower cost of care with ERAS protocol.[15] The study measured the cortisol level, the insulin resistance index, and the levels of inflammatory chemokines; TNF-alpha, IFN-gamma, IL-1 beta and IL-6.
An RCT by Forsmo et al realized a significant reduction in hospital stay with ERAS compared to standard care, mirroring the findings of an earlier study by Aarts et al.[16, 17]
Ripolles et al also found that implementing ERAS protocol achieved a significant reduction in postoperative complications and duration of hospitalization.[19]

These benefits of ERAS protocol implementation have been shown to apply to a wider scope than initially conceptualized. The scope of applicability is no longer restricted to elective surgeries but now encompasses emergency surgeries. Hajibandeh et al in 2020 conducted a meta-analysis of 6 studies evaluating the impact of ERAS protocols on a total of 1334 patients undergoing emergency abdominal surgeries.[21] This study showed a reduction in post-operative complications, faster resumption of normal bowel function, shortened hospital stay, without increasing the rate of reoperation or readmission.[21] This led to the development by the ERAS Society of ERAS guidelines for Emergency Laparotomy in January 2021.[40]

Majumder et al capture the value of ERAS in surgical practice by asserting that ERAS protocols serve to shift the paradigm towards a standardized evidence-based framework of care for surgical patients, rather than the highly individualized and diverse care plans of individual surgeons.[39]

2.4: Importance of Compliance

Various studies have shown that of all the aspects regarding the implementation of ERAS protocol, the most important was the level of compliance

A systematic review by Messenger et al identified compliance with the protocol as the most significant predictive factor for positive outcomes in ERAS programs.[20]

Pedziwiatr et al demonstrated that increasing the level of compliance to the ERAS protocol led to decreased length of hospital stay, as well as a significant reduction in complications.[18] The desired increase in compliance was achieved gradually through a series of phased implementation of the protocol, rather than immediately upon adoption of the protocol.

The compliance progressively improved in subsequent phases about 3 months apart, being 65% in group 1, 83.9% in group 2 and 89.6% in group 3, with a corresponding reduction in perioperative complication rates; recorded at 56%, 43% then 9.4% for groups 1,2 and 3 respectively.

2.5: The challenge

Results from different institutions that have audited the implementation of ERAS Protocol reveal that moving from knowledge of the ERAS guidelines to their full implementation is a journey rather than a one-step occurrence.

Maessen et al showed that adoption of an ERAS Protocol as a clinical practice guideline was in itself not enough to ensure compliance in the implementation of the guidelines.[24] They showed a marked decline in compliance at the postoperative phase compared to the pre-operative and intraoperative phases.

Ahmed et al found that compliance to ERAS Protocols was lower in non-trial setting compared to that in clinical trial setting.[25] Outside the trial setting, clinicians tended to revert to traditional or conventional practice.

A study in 2006 by Walter et al on perceptions of General Surgeons in Leeds, UK, toward application of ERAS Protocols revealed varying attitudes and practices, with a reported compliance of only 31%.[26]

Bona et al demonstrated that the graduation of ERAS Protocols from conceptual guidelines to established "standard of care" in a surgical unit is fraught with challenges despite adoption of the guidelines.[27]

Kahokehr et al showed that implementation of ERAS guidelines is challenging and the barriers need to be identified and addressed as they are multimodal and multidisciplinary.[28]

2.6: Barriers

A study by Nadler et al revealed that there exist multiple factors that act as barriers or enablers to implementation of ERAS guidelines and these influence the serial progression of compliance through the stages of awareness, agreement, adoption and eventually adherence.[29]

They categorized these barriers into patient expectations, surgeon's preferences, family expectations and health care team beliefs. Patient expectations were mainly that 'big' surgeries need slow recovery and that one should lie in bed longer to recover or be hospitalized longer until 100% recovery. Surgeon's preferences were mainly affected by prevailing conventional practice, dogma and lack of personal conviction about ERAS. Family expectations tended to mirror the Patient expectations, but in addition they noted that some families equated better care to longer duration of hospitalization. Health care team beliefs were found to be influenced by lack of training on ERAS and perception by some nurses that ERAS tended to push some patients home too soon. [29]

Kahokehr et al asserted that the most vital factor for successful implementation of ERAS was surgeon willingness to let go of traditional concepts of perioperative care.[28] They particularly identified the fear among surgeons that early discharge would increase the risk of readmission or transfer the burden of recovery to outpatient and community services. They also showed that pre-admission education and counselling was time-limited by the short nature of surgical clinic consults.[28]

Johnson et al singled out the patients' comorbidity profile being perceived as a major hindrance to ERAS actualization.[38] However, it is argued that this misconception is brought about by

viewing ERAS as purely a fast-tracking attempt rather than a package that also seeks to optimize comorbidities for better perioperative outcomes.

Maessen et al identified the lumping together of postoperative patients with acute patients in the same room as being a barrier to implementation of postoperative ERAS elements.[24] They asserted that physical segregation of recovering patients into a "rehabilitation ward" would allow measures such as mobilization, oral diet resumption and administration of oral nutrition supplements to be more carefully structured and implemented.[24]

2.7: Study Justification:

Despite the disproportionately high perioperative morbidity in our local set up, no local studies have been done to assess compliance or determine the barriers to implementation of ERAS guidelines three years after their formal adoption by the KNH General Surgery Department.

Findings from this study will help in recommending measures to improve compliance to ERAS Guidelines in KNH, and elsewhere in this region where there may exist comparable patient profiles, socioeconomic and cultural factors, and operational and technical challenges impeding effective implementation of the guidelines.

It is hoped that with implementation of such measures, a sustained improvement in patient outcomes and lowered cost of surgical care will be realized.

2.8: Research Objectives:

2.8.1: Broad Objective:

- To determine the knowledge, self-reported compliance and perceived barriers to implementation of ERAS Protocol guidelines by General surgeons and surgery residents in KNH.

2.8.2: Specific Objectives:

1. To assess the level of knowledge on the ERAS Protocol among General surgeons and surgery residents in KNH.
2. To evaluate the self-reported compliance with ERAS Protocol guidelines by General surgeons and surgery residents in KNH.
3. To determine the perceived barriers to implementation of ERAS Protocol guidelines in KNH General Surgery unit.

Chapter 3: Methodology

3.1: Study design:

A Descriptive Cross-sectional study design was used.

3.2: Study Site:

The study was conducted at the KNH, General Surgery Unit. KNH is the apex National Teaching and Referral Hospital in Kenya. It is the largest referral hospital in East and Central Africa, with a bed capacity of approximately 2000. KNH serves as the teaching hospital for the University of Nairobi, Faculty of Health Sciences. The General Surgery Unit of KNH comprises of 3 General Surgery wards with a total bed capacity of about 150.

3.3: Study Population:

The study population were the surgeons working in the KNH General Surgery unit, and their residents training or conducting their residency rotations in the KNH General Surgery department.

3.4: Inclusion criteria:

All consenting General Surgery consultants working or teaching in KNH General Surgery department, and residents in any postgraduate surgical specialty or subspecialty who have rotated or are currently rotating through the KNH General Surgery unit were included in the study.

- Residents were drawn from General Surgery, Pediatric Surgery, PRAS, TCVS, Urology, ENT Surgery, Orthopedic surgery, Oral and Maxillofacial Surgery, and Obstetrics and Gynecology departments.

3.5: Exclusion criteria:

All doctors meeting the above criteria but declined to consent for the study were excluded.

3.6: Sample size determination:

This was a Census study, looking to capture the entire study population as defined.

3.7: Sampling technique:

Being a census study, all eligible participants were included, without sampling, from the defined study population.

3.8: Recruitment of study participants:

A list of Consultant General surgeons working in KNH was obtained from the General Surgery Department with their contacts.

All the eligible surgery residents from various specialties were reached through open online forums, and also via their respective Chief Registrars, for closed forums.

All eligible participants were contacted online via the availed contacts, to seek consent and deliver the Questionnaire digitally as a Google Survey Form.

3.9: Data collection tool:

A structured, self-administered two-part questionnaire was used to collect the data (Appendix 2).

The questionnaire was built upon the twenty elements of the ERAS Guidelines as

The first part captured the participants' details:

- Age, Level of specialization (Consultant or Resident), Consultant years of experience, whether Consultant received ERAS training at post-graduate level, Resident level of training, and General Surgery Ward where one is based/last practiced.

The second part had 3 sub-sections;

- A - Multiple choice questions assessing knowledge on ERAS Protocol.
- B – Likert scale score sheet assessing individual compliance with the protocol.
- C – Likert scale score sheet ranking the individual's perception of different items as barriers to implementation of ERAS Protocol.

3.10: Variables:

Independent variables:

Demographics of respondents; Age, Level of specialization (Consultant or Resident), Consultant years of experience/Resident level of training, General Surgery Ward where one is based/last practiced, and whether Consultant received ERAS training at post-graduate level

Dependent variables: Knowledge, Compliance, Barriers identified

For evaluation of knowledge: Score obtained in the questionnaire

For evaluation of self-reported compliance:

- Percentage compliance with the Protocol **per respondent**;
  - Sum of compliance scores on all elements for each individual respondent/total no. of elements in the Protocol x 100%
- Weighted ranking of compliance **for each element of the Protocol**;
  - Sum of compliance scores from all respondents for a particular element/total no. of respondents

For evaluation of barriers: Mean score of the rating of each item as a barrier.

3.11: Data Entry and Management:

Data collection was done through a self-administered, structured questionnaire using the Google Survey Form platform. It was anonymized by disabling the respondent identifier function, including preventing the obtaining of respondents' email addresses.

Data collected was evaluated for correct entry via the Google Survey Form "Responses" tab, using both the "Individual" tab and the "Summary" tab.

An Excel sheet file was then downloaded from the Survey Form to interrogate the data for integrity, conduct basic analysis -deriving means, medians and proportions, with subsequent entry into SPSS Version 26 for further analysis.

All data entered was stored in password-protected files.

3.12: Data Analysis:

SPSS 26 was used for data analysis. Categorical data was presented as frequencies and proportions. Continuous variables were analysed and presented as means, SD, medians and ranges.

To assess statistical differences in knowledge and compliance scores among various groups, student T test was used for groups with 2 categories whereas One-way ANOVA was used for groups with 3 or more categories for normal data.

P values of <0.05 were considered statistically significant, and the results reported with respective 95% confidence intervals.

Data has been presented in bar graphs, pie charts, cluster charts, frequency tables, histograms, interval plots, box plots and individual value plots.

3.13: Limitations:

Being a self-administered questionnaire, the investigator was not present with the respondents as they filled the questionnaire, therefore correspondence between participants about the filling of their responses could not be prevented.

Recall bias; those who rotated through the General Surgery unit further in the past may not have been able to accurately recollect details about compliance or prevailing barriers

Compliance ratings were self-reported and thus prone to over-rating above the actual compliance that would have been deduced from interrogation of patient care records or direct observation.

3.14: Ethical Considerations:

Approval to conduct the study was sought from the KNH-UoN Ethics and Research Committee.

Informed consent was sought from each participant as the pre-amble on the form, prior to going through the survey form.

The research instrument was kept anonymous throughout the study. Full confidentiality was maintained.

Chapter 4: Results:

4.1: Demographics:

The study gathered feedback from 53 respondents, of whom 83% were surgery residents and 17% were consultants.

Of the consultants who participated, 89% had worked for less than 5 years as consultants, while only 11% had longer experience.

Among the Consultants, only 78% reported having received ERAS training at postgraduate level.

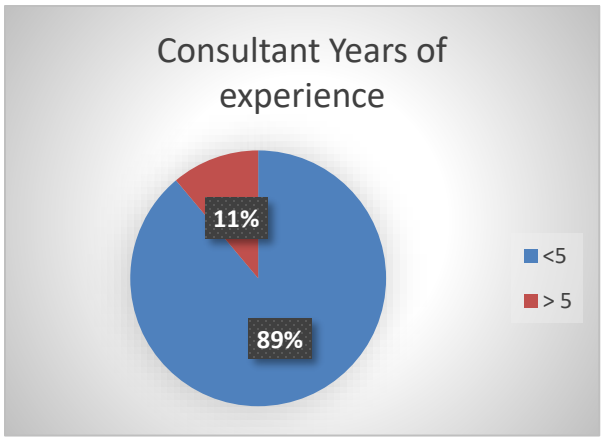

Figure 1: Consultant Years of experience

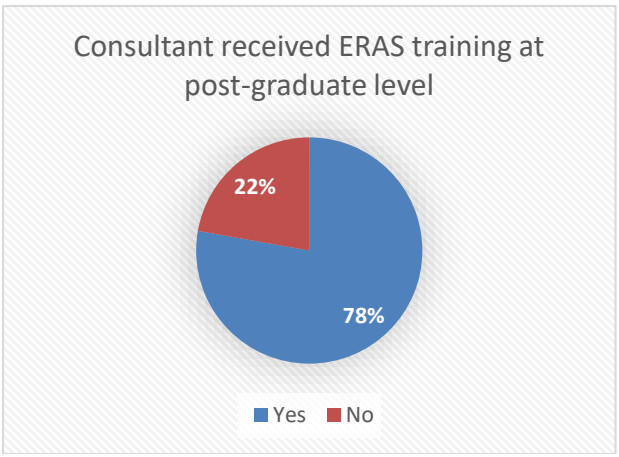

Figure 2:Consultants trained on ERAS

Majority of the respondents (94%) were aged 31 to 40 years, and none over 50 years.

Most of the residents who responded were in their 5th year of MMed studies, while the distribution of all respondents across the three General Surgery wards was fairly even, as shown.

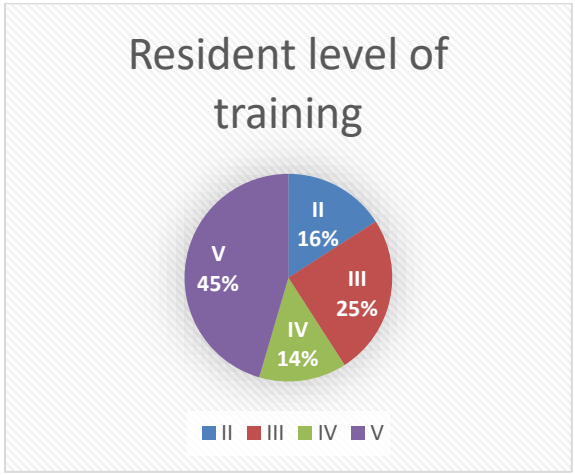

Figure 3: Residents year of training

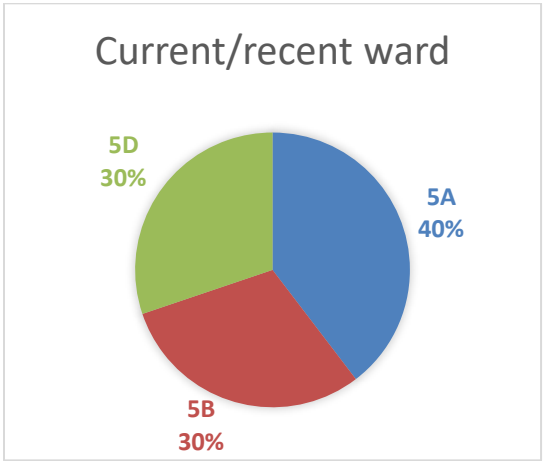

Figure 4: Current/recent ward

4.2: Knowledge levels on ERAS:

With awareness determined by a correct response on what the abbreviation ERAS stands for in full, there was near universal awareness; 98%.

Level of knowledge was evaluated using ten MCQs covering ten of the key elements of ERAS, whereby respondents were required to pick one correct answer from 4 options. Each correct answer had a score of 1, hence a maximum score of 10.

Table 1: Knowledge mean scores per group

Demographic group	Group mean score (%)
Overall	57.7
Residents	55.7
Consultants	67.8
< 5yrs Consultants	70
>5yrs Consultants	50
Had ERAS training -Consultant	70
No ERAS training-Consultant	60
Yr 2 resident	58.6
Yr 3 resident	59.2
Yr 4 resident	36.7
Yr 5 resident	58.3
5A	54.8
5B	58.8
5D	60.6
<30 yr	60
31-40yrs	57.6
41-50yrs	60

Mean score for knowledge was 5.77, SD 2.07, Median 6, I.Q.R 25 3 - 75 7

4.2.1: Association between knowledge score and level of specialization

Despite consultants scoring marginally higher in knowledge than residents, there were no significant differences in the scores.

Table 2:Knowledge scores -Consultants vs Residents

Group	Obs (n)	Mean	Std. Dev	P value (t test)
Consultants	9	6.78	2.28	0.111
Registrars	44	5.57	1.99	
Combined	53	5.77	2.07	

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4.2.2: Knowledge by consultant training on ERAS

Those trained were more knowledgeable, however, there was no significant difference; P = 0.521.

Table 3:Knowledge scores -Consultanst training on ERAS

Consultant training on ERAS	N	Mean	Std. Dev	SE Mean	P value
No	2	6.00	1.41	1.0	0.521
Yes	7	7.00	2.52	0.95	

This was mirrored when comparing the consultants with longer experience (> 5 years) vs those with less than 5 years' experience; mean score of 5 vs 7.

4.2.3: Knowledge scores by levels of registrar

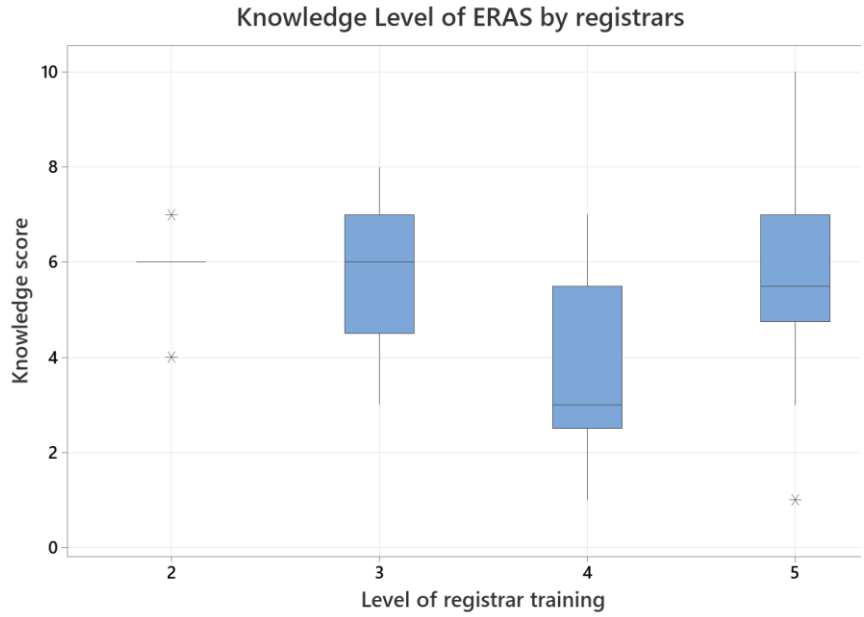

Figure 5: Box plot- knowledge scores- by level of registrars

Pooled St Dev = 1.907

Year 4 residents performed lowly on level of Knowledge on ERAS compared to other groups. However, upon analysis by ANOVA, the differences were not statistically significant; P =0.091.

4.2.4: Knowledge scores by ward of practice

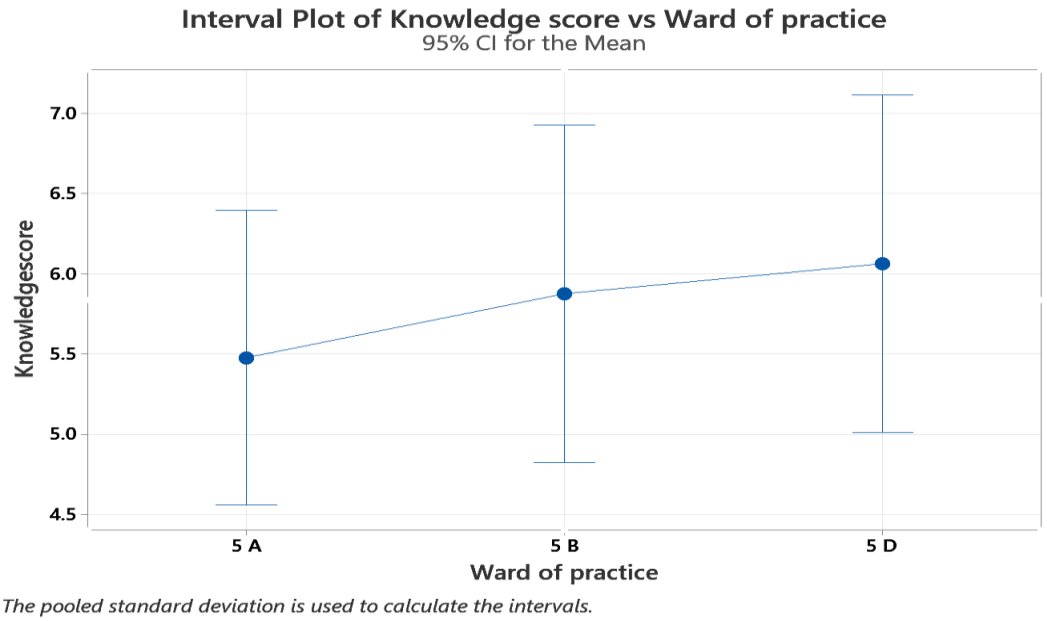

Figure 6:Interval Plot -Knowledge -by Wards

Knowledge levels were nearly equal across the different wards as well as different age groups.

4.2.5: Knowledge levels for different concepts:

With regard to particular concepts, the concepts on which respondents had the lowest knowledge level were as shown:

Table 4: ERAS elements with lowest knowledge levels

Concepts with lowest knowledge levels	Knowledge rate (% correctly answered)
Bowel preparation for colorectal surgeries	24.52%
Preoperative optimization; anemia, malnutrition…	35.85%
Preoperative fasting	39.62%

4.3: Self-reported compliance to ERAS guidelines:

Self-reported compliance to ERAS was assessed against the 20 elements of ERAS, with compliance to each item scored on a Likert scale of 1 to 4, hence a maximum score of 80 per respondent.

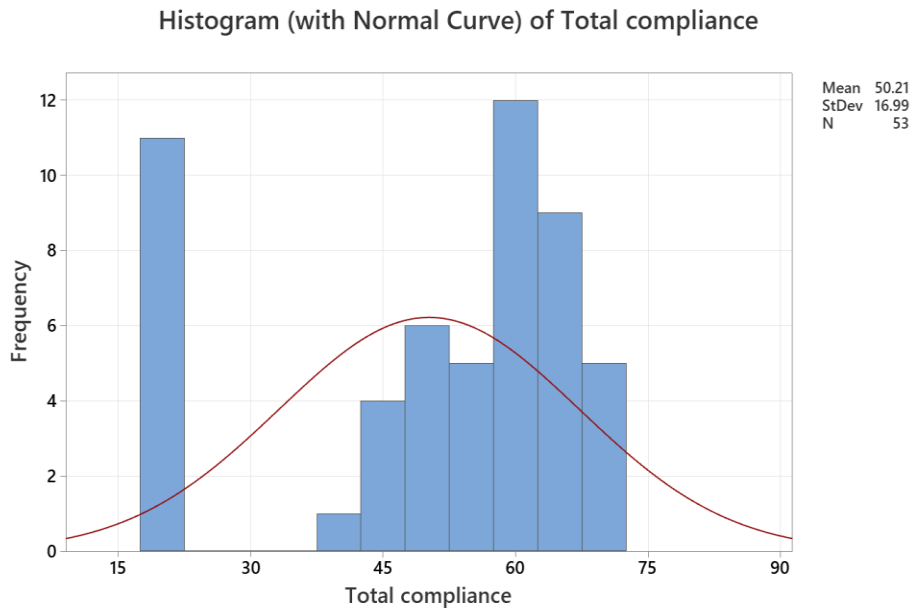

Figure 7: Compliance scores histogram

4.3.1: Association between compliance score and level of specialization

Registrars had higher mean scores for overall compliance than Consultants; 52% vs 43%.

However, this difference was not statistically significant; P = 0.322.

Table 5:Compliance -Consultant vs Residents

Level of Specialization	N	Mean	Std. Dev	SE Mean	P value
Consultant	9	43.3	22.6	7.5	0.322
Resident / Registrar	44	51.6	15.6	2.3	

4.3.2: Association between compliance score and year of residency

ANOVA was used to assess differences in means of total compliance between different levels of training of residency. Year 2 scored highest. However, there were no significant differences between groups, p = 0.744, Pooled S.D. = 15.883

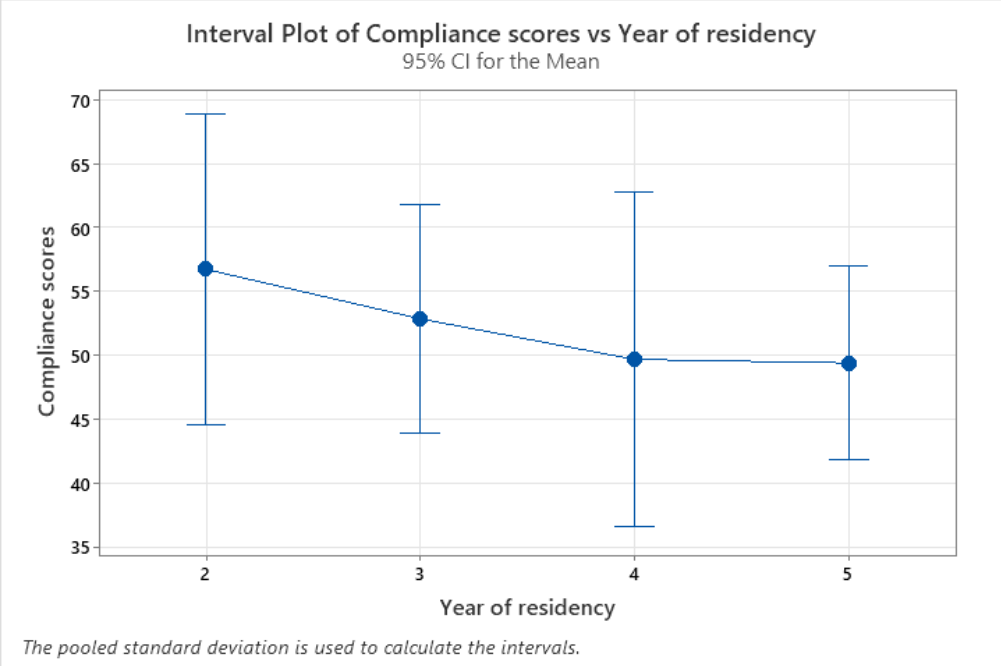

Figure 8: Interval Plot- Compliance by Residency level

4.3.3: Association between compliance score and consultant training

There was no significant difference in compliance between consultants who had undergone ERAS training during their postgraduate studies and those who did not; p = 0.963.

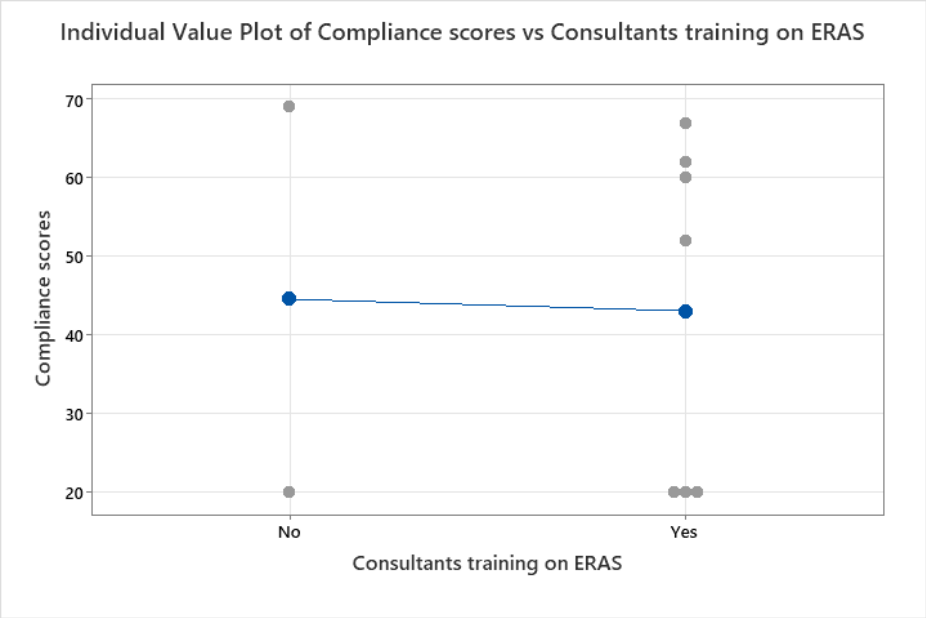

Figure 9:Individual Value Plot -Compliance- Consultants ERAS trained or not

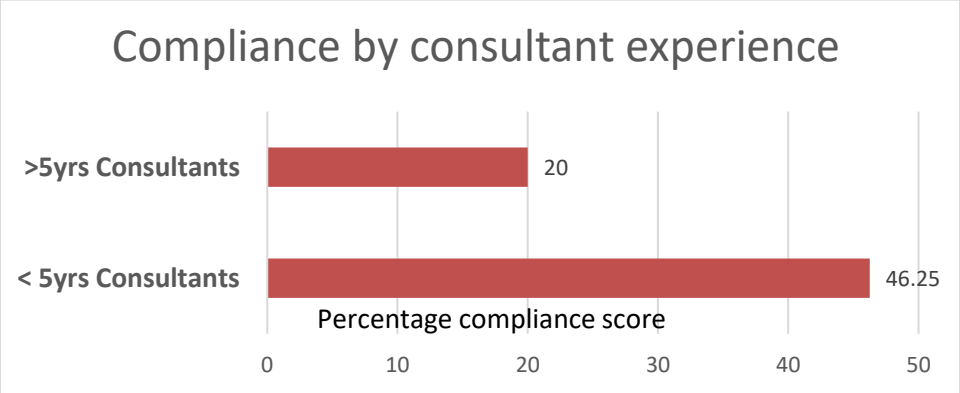

Figure 10: Cluster chart -Compliance by consultant experience

Consultants with longer experience were less compliant.

4.3.4: Association between compliance score and Ward of practice

Despite ward 5D scoring much lower, the difference was not statistically significant; P = 0.199.

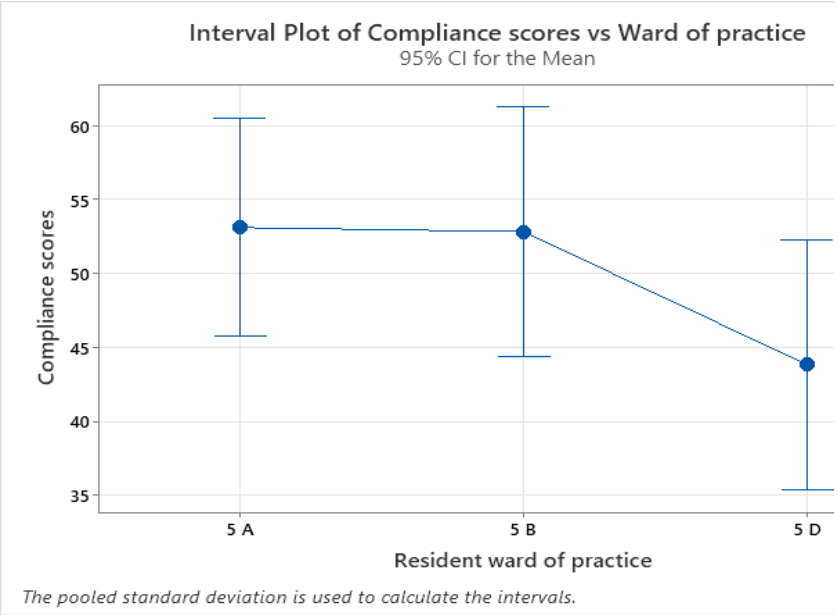

Figure 11: Interval Plot- Compliance scores by wards

Pooled S.D = 16.78

4.3.5: Self-reported compliance per element of ERAS:

Table 6:Compliance rating per ERAS element

Top 3 elements (highest compliance)	**Compliance score**
Administer antimicrobial prophylaxis within 60 minutes pre-incision	3.21 =64.2%
Evaluation and optimization of comorbidities pre-op	3.08 =61.6%
Address anemia prior to admission	3.08 =61.6%
Bottom 3 elements (least compliance)	**Score**
Encourage pre-habilitation by exercise	1.96 =39.2%
Encourage carbohydrate rich clear fluid up to 2 hours pre-op	1.91 =38.2%
Request warming and humidification of inhalation gases	1.69 =33.8%

4.4: Perceived barriers to implementation:

Perception of various issues as barriers was scored on a Likert scale of 1 to 5, and the following were the top 5 barriers.

Table 7: Barrier rating per item

	Top 5 Barriers	**score**
1	Non-availability of clear carbohydrate drinks preoperatively	4.06 = 81.2%
2	Lack of an appointed ERAS Coordinator	4.00 =80%
3	Lack of Nutritional outpatient clinic pre-admission	3.89 =77.8%
4	Lack of training/CMEs on ERAS	3.74 =74.8%
5	Financial difficulty with pre-admission nutritional support	3.72 =74.2%

The issues least perceived as barriers were patients' fears against early oral feeding (54.4%), and lack of personal conviction with available evidence on effectiveness of ERAS protocol (57%).

Chapter 5: Discussion

5.1: Knowledge:

The findings show that despite awareness of what ERAS is being high at 98%, the knowledge about its elements was much lower at just 57.7% -mean score of 5.77 out of 10.

There was no previous study found that looked specifically at Knowledge levels on ERAS, hence this is a novel finding in this topic, and is important given that ERAS was adopted by the KNH General Surgery Department 4 years ago.

This low level of knowledge could be explained by our finding that one of the top items identified as a barrier to ERAS implementation was Lack of training or CME teachings on ERAS (Table 7).

This study revealed that Consultants with longer experience (> 5 years) had lower levels of knowledge than those with shorter experience.

These findings agree with the study by Bona et al [27], which asserts that ERAS Protocols' absorption is impeded by surgeons' "confidence with results achieved by the routinary application of traditional care pathways, and the poor propensity to evidence based concepts".

However, this could also be explained by the lack of ERAS training during Postgraduate studies among the older consultants, as the comparison between those who received the training and those who did not showed a similar difference in knowledge score.

A key finding of this study is that two of the elements with greatest bearing on ERAS outcomes had the lowest knowledge rates among respondents; preoperative optimization (mainly on correction of anemia and malnutrition) and preoperative fasting (Table 4). This could impact on the compliance to these two key ERAS elements and thus on surgical outcomes.

5.2: Self-reported Compliance:

The self-reported compliance by respondents to ERAS Protocols was found to be 50.2%.

This score is within the reported range from other studies; 31% by Walter et al[26] and 65% by Pedziwiatr et al[18]. However, it is notable that these comparison studies were in advanced centers that were pioneers of ERAS guidelines, and that our scores may seem to compare well only because they were self-reported evaluation of compliance rather than direct interrogation of care practices.

The following three findings in this study point at the same conclusion about decline in compliance with increasing tendency to adhere to dogma and traditional practice;

- that residents were more compliant than consultants
- that junior residents were more compliant than senior residents
- that compliance was lower among senior consultants compared to consultants with < 5 years' experience; 20% vs 46.3%

The finding that the compliance levels decrease with increase in seniority of the residents contrasts with the study by Nadler et al[29] which found the converse. Our finding may be explained by the likelihood that the senior residents, having apprenticed longer, tend to emulate more the practice of their consultants in perpetuating conventional/traditional practices.

This is evidenced by our finding in the Barriers domain, where "favorable outcomes with conventional practices" were strongly rated as a barrier to ERAS implantation; rating of 62.6%.

However, it is likely that the use of self-reported compliance ratings may distort the true evaluation of compliance; mainly because practitioners with better understanding of the various ERAS elements may rate their own compliance harshly /poorly despite having actually less deviation from the recommended ERAS practices, compared to their less experienced colleagues.

The element with the least compliance was "requesting warming and humidification of inhalation gases". This may be due to the fact that the inhalational gases used in KNH are pre-humidified and warmed before delivery through the supply piping.

The second lowest compliance was on "encouraging carbohydrate rich clear fluid up to 2 hours pre-op". This may be attributed to either the low knowledge level on pre-operative fasting guidelines as evidenced in the Knowledge domain findings, or the non-availability of such fluid preparations as seen in the Barriers domain results.

Across the different ERAS elements, our study showed wide variation of compliance ratings, range of 33% to 64% -Table 6.

This range is comparable but less than that from other studies; Ahmed et al[25]; 25% to 98%, and Maessen et al[24]; 13% to 100%.

However, Maessen's study found that compliance was lower in the post-operative phase elements, contrary to our finding where the elements with least compliance were of the pre-operative phase; in this study only timely removal of NGT scored poorly among the post-operative elements, at 42%.

5.3: Perceived barriers:

Lack of an ERAS Coordinator was identified as a top barrier to implementation of ERAS (80% rating). This is in concurrence with the findings by Pedziwiatr et al[18].

Lack of trainings or CMEs on ERAS was also strongly identified as a barrier (78.8% rating); in keeping with findings from other studies such as Nadler et al[29].

Notably, three of the top 5 barriers identified centered around pre-operative nutrition -Table 7. This could be attributable to the low knowledge level about this particular element as evidenced in the scores for the Knowledge domain of our results (Table 4).

Factors explaining this would be our local focus on post-operative nutrition with downplaying of the role of pre-operative nutrition, and/or the institutional workflow arrangement where pre-admission teams reviewing patients for major elective surgery fail to include the nutritionist.

5.4: Conclusion

Despite the awareness among practitioners and the adoption by the KNH General Surgery Department, knowledge levels remain disturbingly low as demonstrated by this study.

ERAS elements with low knowledge rating among respondents had correspondingly poor compliance rating.

This lays credence to the need, as demonstrated in this and other studies, to address the barrier of lack of training and regular CME teachings on ERAS guidelines. This may serve to also reduce the tendency to stick to traditional practice among the senior colleagues as discussed.

Key in the interventions include the appointment of an ERAS Coordinator as this was most strongly identified as a key barrier to implementation.

Availability of organized nutritional support should be expanded beyond the post-operative phase to include a robust pre-operative nutritional clinic for elective patients whose surgeries are expected to occasion high surgical stress.

5.5: Recommendations

A more objective audit of our local compliance may be obtained in future studies by structured interrogation of surgical care practices through methods such as direct observation in respective service areas across the four ERAS phases, querying of patient care records as well as structured interviews with the consumer of the care services - the patients themselves.

With the already universally established benefits of implementation of ERAS guidelines both on patient outcomes and cost of care, concerted effort should be made to ensure maximal compliance with the elements of the ERAS Protocol.

Finally, teamwork between the various practitioners is key as ERAS protocols are multidisciplinary and the various elements interlinked to achieve the desired ultimate outcome.

To foster adherence and administrative support, future local studies may evaluate the impact of ERAS protocol implementation as regards improvement of patient outcomes and reduction of hospital stay in our setting - both of which may have great economic benefit.

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Appendix 1: ERAS Protocol

ERAS Society Guideline Elements	
Element	Target Effect and/or Comment
Preadmission	
Cessation of smoking and excessive intake of alcohol	Reduce complications
Preoperative nutritional screening, assessment and support	Reduce complications
Medical optimization of chronic disease	Reduce complications
Preoperative	
Structured preoperative information and engagement of the patient and relatives or caretakers	Reduce anxiety, involve the patient to improve compliance with protocol
Preoperative carbohydrate treatment	Reduce insulin resistance, improve well-being, possibly faster recovery
Preoperative prophylaxis against thrombosis	Reduce thromboembolic complications
Preoperative prophylaxis against infection	Reduce infection rates
Prophylaxis against nausea and vomiting	Minimize postoperative nausea and vomiting
Intraoperative	
Minimally invasive surgical techniques	Reduce complications, faster recovery, reduce pain
Standardized anesthesia, avoiding long-acting opioids	Avoid or reduce postoperative ileus
Maintaining fluid balance to avoid over- or under-hydration, administer vasopressors to support blood pressure control	Reduce complications, reduce postoperative ileus
Epidural anesthesia for open surgery	Reduce stress response and insulin resistance, basic postoperative pain management
Restrictive use of surgical site drains	Support mobilization, reduce pain and discomfort, no proven benefit of use
Removal of nasogastric tubes before reversal of anesthesia	Reduce the risk of pneumonia, support oral intake of solids
Control of body temperature using warm air flow blankets and warmed intravenous infusions	Reduce complications
Postoperative	
Early mobilization (day of surgery)	Support return to normal movement
Early intake of oral fluids and solids (offered the day of surgery)	Support energy and protein supply, reduce starvation-induced insulin resistance

Early removal of urinary catheters and intravenous fluids (morning after surgery)	Support ambulation and mobilization
Use of chewing gums and laxatives and peripheral opioid-blocking agents (when using opioids)	Support return of gut function
Intake of protein and energy-rich nutritional supplements	Increase energy and protein intake in addition to normal food
Multimodal approach to opioid-sparing pain control	Pain control reduces insulin resistance, supports mobilization
Multimodal approach to control of nausea and vomiting	Minimize postoperative nausea and vomiting and support energy and protein intake
Prepare for early discharge	Avoid unnecessary delays in discharge
Audit of outcomes and process in a multi-professional, multidisciplinary team on a regular basis	Control of practice (a key to improve outcomes)
For details and references, see the guidelines at http://www.erassociety.org.	

Appendix 2: Data Collection Tool

Serial No. _____

Knowledge, compliance and barriers to implementation of ERAS Guidelines by General Surgeons and Residents in Kenyatta National Hospital

Section 1: Practitioner's demographics and profile

Age (in years)	≤ 30	31-40	41-50	>50
Level of Specialization	Consultant		Resident	
For consultants: Years of Experience	< 5		≥5	
For consultants: Received ERAS training at post-graduate level	Yes		No	
For residents: Residency year of training	2	3	4	5
Ward currently / most recently based	5A	5B	5D	

Section 2:

Part A: Knowledge assessment (10 questions)

How would you rate your knowledge of ERAS Guidelines in surgery?

A. Low
B. Average
C. High but not up to date
D. High and up to date

1. The abbreviation ERAS stands for which of the following in full?
   A. Enhanced Recovery Adjustments following Surgery
   B. Elaborate Recovery After Surgery
   C. Enhanced Recovery After Surgery
   D. Enhanced Response Acceleration following Surgery

2. Which option best depicts the scope of applicability of ERAS Guidelines?
   A. Colorectal surgeries
   B. Elective abdominal surgeries
   C. Elective and emergency abdominal surgeries
   D. Elective and emergency surgeries of the abdomen and other regions

3. ERAS Protocol implementation for elective patients begins:
    A. Preadmission
    B. Upon admission, before surgery
    C. Intraoperatively
    D. Postoperatively
4. In preoperative ERAS care:
    A. Elective patients' information, education and counselling is done upon admission
    B. Minimum recommended duration for smoking cessation is four weeks pre-op
    C. Routine hair shaving has been shown to decrease SSI rates
    D. Preoperative antiseptic shower has stronger recommendation than using chlorhexidine-alcohol based skin preparation
5. For preoperative optimization, ERAS Protocols recommend:
    A. Anemic patients due for elective colorectal surgeries are mostly recommended to receive oral hematinics rather than intravenous iron supplements
    B. Anemic patients due for elective colorectal surgeries should routinely undergo blood transfusion preadmission rather than using hematinics
    C. Malnourished patients should receive nutritional supplementation for at least 7 days pre-op
    D. Prophylaxis for PONV (Post-op Nausea and Vomiting) is preferably by a single drug rather than multimodal
6. Regarding bowel preparation for colorectal surgeries:
    A. Combined MBP (Mechanical Bowel Preparation) and oral antibiotic preparation is strongly recommended
    B. Rectal surgery has higher recommendation for MBP than colonic surgery
    C. Standard systemic antibiotic prophylaxis covering aerobic and anaerobic bacteria is mostly not considered sufficient bowel preparation by itself
    D. Oral antibiotic bowel preparation is highly recommended in addition to systemic antibiotic prophylaxis
7. Regarding preoperative fasting:
    A. Patients with delayed gastric emptying should be kept NPO for at least 6 hours preoperatively

B. Elective colorectal surgery patients should be allowed carbohydrate rich clear fluid up to 4 hours preoperatively only
C. Elective colorectal surgery patients should be allowed solid diet up to 4 hours preoperatively
D. Elective colorectal surgery patients should be fasted overnight preoperatively

8. Current anaesthesia recommendations in ERAS assert that:
   A. In laparoscopic surgeries, routine use of thoracic epidural anaesthesia is preferred to combination of General Anesthesia with TAP (Transverse abdominis plane) block
   B. Nitrous oxide has been shown to have no delaying effects on resumption of bowel motility
   C. Combining regional and general anaesthesia is helpful in avoidance of intraop hypothermia
   D. Intraop hypothermia has a bearing on post-op oxygen requirements
9. Regarding use of peritoneal/pelvic drains and NGTs (Nasogastric tubes):
   A. Use of intra-abdominal or pelvic drains has been shown to decrease anastomotic leakage
   B. Use of intra-abdominal drains is recommended as a measure to minimize reoperation rates
   C. NGTs should ideally be removed before reversal of anesthesia
   D. NGTs are not helpful in avoiding gastric injury during laparoscopic abdominal surgery
10. ERAS guidelines on postoperative care recommend:
   A. Avoidance of zero fluid balance
   B. Oral diet can be started within 4 hours postoperatively
   C. No extended urinary catheterization beyond POD 1 in pelvic reconstructive surgery
   D. Mild postop hyperglycemia is best managed peri-operatively using Insulin rather than using stress-reducing elements of ERAS

Part B: Evaluating Compliance

Do you currently apply ERAS Guidelines to your practice? Y/N (If Yes, answer the following questions.)

Tick to indicate **how often you implement or implemented** the following ERAS Protocol elements in your current practice / recent rotation(s) at KNH General Surgery unit: Never =1, Rarely =2, Most of the time =3, Always =4

ERAS Protocol Elements (ERAS Society Updated Guidelines, 2018)	Compliance			
	1	2	3	4
1. Preadmission information, education and counselling about the full perioperative plan				
2. Evaluation and optimization of medical illnesses and other comorbidities preoperatively				
3. Demand cessation of smoking and excessive alcohol intake preadmission				
4. Encourage pre-habilitation by exercise and strength training				
5. Preoperative nutritional assessment and support				
6. Address anemia prior to admission				
7. Avoid routine bowel preparation				
8. Encourage carbohydrate rich clear fluid up to 2 hours preoperatively in elective cases with no delayed gastric emptying				
9. Administer antimicrobial prophylaxis within 60 minutes before incision				
10. Recommend anterior abdominal wall blocks e.g. TAP, subcostal and rectus blocks				
11. Request warming and humidification of inhalation and insufflation gases				
12. Opt for minimally invasive approaches where feasible e.g. laparoscopic, transanal etc.				
13. Avoid routine use of peritoneal or pelvic drains				
14. Remove NGT before reversal of anesthesia				
15. Do thromboprophylaxis; mechanical or pharmacological (e.g. LMWH)				
16. Actively enforce opioid avoidance or opioid-sparing analgesia				

17. Observe near-zero fluid balance (replacing ongoing losses only on a like-for-like basis, in addition to maintenance requirements) and stop IVF once tolerating orally				
18. Offer early oral feeding from POD 0				
19. Begin mobilization measures from POD 0				
20. Removal of urethral catheter by POD 1				

Part C: Determining the Barriers

How do you **perceive the following as barriers** to implementation of ERAS Guidelines in KNH General Surgery unit?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Lack of training/CMEs on the ERAS guidelines					
2. Lack of personal conviction with available evidence on effectiveness					
3. Favorable outcomes with traditional/conventional practices					
4. Fear of trying new practices					
5. Lack of ERAS Protocol support by your seniors in the unit					
6. Lack of an appointed ERAS Coordinator					
7. Inadequate time for preadmission interaction in SOPC					
8. Financial difficulty with preadmission nutritional support					
9. Lack of Nutritional outpatient clinic for preadmission assessment and care					
10. Non-availability of clear carbohydrate drinks preoperatively					
11. Lack of enough laparoscopy equipment					
12. Inadequate expertise/ skills for laparoscopic surgery					

13. Patients' beliefs/fears against early oral feeding					
14. Patients' reluctance or perception against early mobilization					
15. Patients' physiological inability to tolerate early ambulation					
16. Absence of other multidisciplinary team members in ward rounds (e.g. physiotherapist, nutritionist, counselor)					
17. High turnover of staff and Residents in the wards, losing momentum					
18. High workload requirement with ERAS					
19. Additional non-pharmaceutical supplies required					
20. Low inpatient availability of non-opioid multimodal analgesics					

Appendix 3: Informed Consent Form –English Version

Knowledge, compliance and barriers to implementation of ERAS Guidelines by General Surgeons and Residents in KNH

This Informed Consent form is for surgeons and residents who have practiced or trained, or are currently practicing or training, in the General Surgery wards at KNH. We are requesting these practitioners to participate in this research project whose title is "Knowledge, compliance and barriers to implementation of ERAS Guidelines by General Surgeons and Residents in Kenyatta National Hospital."

Principal investigator: Dr. Warui Jack Kamau.

Institution: Faculty of Health Sciences, Department of Surgery- University of Nairobi

Supervisors: Dr. Daniel Kinyuru Ojuka and Dr. Peter Wambugu Mwangi

This informed consent has three parts:

1. Information sheet (to share information about the research with you)
2. Certificate of Consent (for signatures if you agree to take part)
3. Statement by the researcher

You will be given a copy of the full Informed Consent Form.

Part I: Information sheet

My name is Dr Warui J Kamau, a post graduate student at the University of Nairobi's Faculty of Health Sciences, Department of Surgery. I am carrying out a study to determine the knowledge, compliance and barriers to implementation of ERAS Protocol guidelines by General Surgeons and surgery Residents in Kenyatta National Hospital.

Following your consent to participate in this research, we will record your age, level of specialization (Consultant vis a vis Resident), length of experience (Consultant years of practice) or Resident level of training, Resident's specialty, and the General Surgery Ward where one is based/last practiced.

This information will help in analyzing the factors influencing perceptions and practice on ERAS guideline implementation in KNH General Surgery wards, to help in recommending measures to improve compliance to these guidelines in KNH.

The respondent's personal details captured as above shall be strictly confidential to the researcher only. No names or any information that can trace you in anyway will be recorded.

I invite you to participate in this study and you are free to either agree immediately after receiving this information or later after thinking about it. Feel free to seek clarification from either myself or my assistant on any issues or if there are words or details which you do not understand.

The information will not be shared with anyone else unless authorized by the Kenyatta National Hospital/University of Nairobi – Ethics and Research Committee (KNH/UoN-ERC).

This proposal has been reviewed and approved by the KNH/UoN-ERC which is a committee whose work is to make sure research participants are protected from harm, and that the study adheres to ethics of research. The contact information is given below if you wish to contact the KNH/UoN-ERC, the Principal investigator or the supervisors;

Secretary, KNH/UoN-ERC
P.O. Box 20723 KNH, Nairobi 00202
Tel 7263009
Email: uonknh_erc@uonbi.ac.ke

Principle researcher:

Dr. Warui Jack Kamau
Department of Surgery, Faculty of Health Sciences, University of Nairobi
P.O. Box 237 – 00517 Uhuru Gardens, Nairobi.
Mobile phone: 0722447418
Email waruisurg@students.uonbi.ac.ke

University of Nairobi research supervisors:

1. Dr. Daniel Kinyuru Ojuka
MB ChB- UoN, MMed General Surgery- UoN, PhD - UoN
Senior Lecturer at the Department of Surgery, University of Nairobi
Consultant General Surgeon, Kenyatta National Hospital
P.O. Box 19676 KNH, Nairobi 00202

2. Dr. Peter Wambugu Mwangi
MB ChB –UoN, MMed General Surgery –UoN
Senior Lecturer at the Department of Surgery, University of Nairobi
Consultant General Surgeon, Kenyatta National Hospital
P.O. Box 19676 KNH, Nairobi 00202

PART II: CONSENT FORM for the research on Knowledge, compliance and barriers to implementation of ERAS Guidelines by General Surgeons and Residents in KNH

.

Informed Consent for inclusion in the above study is hereby given by Dr/Prof ……. having understood the aim, benefits and risks associated with my inclusion in the study.

Respondent's signature……. Date……...

Principal investigator: Dr. Warui J Kamau

Institution: University of Nairobi, Faculty of Health Sciences, Department of Surgery.

Part III: Statement by the researcher

I have explained in the information sheet the necessary details regarding the study for the respondent to participate, and to the best of my ability made sure that the participant understands the following:

- All information given will be treated with confidentiality.
- Refusal to participate in the study will not in any way disadvantage their professional standing in KNH or otherwise.
- The results of this study might be published to enhance knowledge and to help improve compliance to ERAS Guidelines in KNH, and elsewhere in this region where there may exist comparable factors and features.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Name of researcher taking consent……

Signature of researcher taking the consent……

Date……

Appendix 4: Informed Consent Form – Swahili Version -Fomu ya idhini

Maarifa, uzingatiaji na vizuizi katika utekelezaji wa miongozo ya itifaki ya ERAS na wahadhiri wataalam wa upasuaji na wanafunzi wa shahada ya uzamili katika upasuaji wa jumla, kwenye Hospitali ya Kitaifa ya Kenyatta

Sehemu ya kwanza: MAELEZO YA DAKTARI MTAFITI.

Mimi ni Dkt Warui J Kamau, kutoka Chuo Kikuu cha Nairobi, Kitivo cha sayansi ya afya, Idara ya upasuaji. Ninafanya utafiti kuhusu maarifa, uzingatiaji na vizuizi katika utekelezaji wa miongozo ya ERAS na madaktari wanaofanya upasuaji wa jumla, katika KNH.

Hati hii ya idhini ni ya wataalam wa upasuaji na wanafunzi wao wahitimu ambao wamefanya mazoezi au mafunzo, au kwa sasa wanafanya mafunzo, katika wadi ya upasuaji wa jumla huko KNH. Tunawaomba watendaji hawa kushiriki katika mradi huu wa utafiti ambao jina lake ni " Maarifa, uzingatiaji na vizuizi katika utekelezaji wa miongozo ya ERAS na wahadhiri wataalam wa upasuaji na wanafunzi wa shahada ya uzamili katika upasuaji wa jumla kwenye Hospitali ya Kitaifa ya Kenyatta."

Mpelelezi mkuu: Dk. Warui Jack Kamau.

Taasisi: Idara ya upasuaji, Kitivo cha sayansi ya afya, Chuo Kikuu cha Nairobi

Wasimamizi: Dk. Daniel Kinyuru Ojuka na Dk. Peter Wambugu Mwangi

Idhini hii iliyo na habari ina sehemu tatu:

1. Karatasi ya habari (kushiriki habari juu ya utafiti na wewe)
2. Cheti cha idhini (kwa saini ikiwa unakubali kushiriki)
3. Taarifa ya mtafiti

Utapewa nakala ya Fomu ya Hati ya Kujulishwa kamili.

SEHEMU YA I: **MUHTASARI KUHUSU UTAFITI NA KIBALI CHA IDHINI**

Jina langu ni Dk Warui J Kamau, mwanafunzi wa shahada ya uzamili katika Chuo Kikuu cha Nairobi, Kitivo cha sayansi ya afya, Idara ya upasuaji. Ninafanya utafiti ili kujua maarifa, uzingatiaji na vizuizi katika utekelezaji wa miongozo ya Itifaki ya ERAS na wataalam na wanafunzi wa upasuaji wa jumla katika Hospitali ya Kitaifa ya Kenyatta.

Kufuatia idhini yako ya kushiriki katika utafiti huu, tutarekodi umri wako, kiwango cha utaalam (Mtaalam au Mwanafunzi), urefu wa uzoefu (miaka katika kazi ya Mtaalam) au kiwango cha mafunzo cha mwanafunzi, utaalam ambao mwanafunzi anasomea, na wadi ya upasuaji wa jumla ulikokuwa mwisho.

Habari hii itasaidia katika kuchambua sababu zinazoathiri mitizamo na mazoezi juu ya utekelezaji wa mwongozo wa ERAS katika wadi za KNH General Surgery, ili kusaidia katika kupendekeza hatua za kuboresha utekelezaji wa miongozo hii katika KNH

Maelezo ya kibinafsi ya mhojiwa yaliyopokewa kama ilivyoelezewa hapo awali yatakuwa siri kabisa kwa mtafiti tu. Hakuna majina au habari yoyote ambayo inaweza kukufuata kwa njia yoyote itarekodiwa.

Ninakualika kushiriki katika utafiti huu na uko huru kukubaliana mara baada ya kupokea habari hii au baadaye baada ya kufikiria juu yake. Jisikie huru kutafuta ufafanuzi kutoka kwangu au msaidizi wangu juu ya maswala yoyote au ikiwa kuna maneno au maelezo ambayo hauelewi.

Habari hiyo haitashirikiwa na mtu mwingine yeyote isipokuwa imeidhinishwa na Hospitali ya Kitaifa ya Kenyatta / Chuo Kikuu cha Nairobi - Kamati ya Maadili na Utafiti (KNH / UoN-ERC).

Pendekezo hili limepitiwa na kupitishwa na KNH / UoN-ERC ambayo ni kamati ambayo kazi yake ni kuhakikisha washiriki wa utafiti wanalindwa kutokana na madhara, na utafiti unafuata kanuni za maadili. Habari ya mawasiliano imepewa hapa chini ikiwa unataka kuwasiliana na KNH / UoN-ERC, mpelelezi mkuu au wasimamizi wake;

Katibu, KNH / UoN-ERC
P.O. Sanduku 20723 KNH, Nairobi 00202
Simu 7263009
Barua pepe: uonknh_erc@uonbi.ac.ke

Mtafiti mkuu:
Dk. Warui Jack Kamau
Idara ya upasuaji, Kitivo cha sayansi ya afya, Chuo Kikuu cha Nairobi
P.O. Sanduku 237 - 00517 Bustani za Uhuru, Nairobi.
Simu ya rununu: 0722447418
Barua pepe waruisurg@students.uonbi.ac.ke

Wasimamizi wa mtafiti wa Chuo Kikuu cha Nairobi:
1. Dk. Daniel Kinyuru Ojuka
MB ChB- UoN, MMed General Surgery- UoN, PhD - UoN
Mhadhiri mwandamizi katika Idara ya upasuaji, Chuo Kikuu cha Nairobi
Mshauri Mkuu wa upasuaji wa jumla, Hospitali ya Kitaifa ya Kenyatta
P.O. Sanduku 19676 KNH, Nairobi 00202

2. Dk. Peter Wambugu Mwangi
MB ChB -UoN, MMed General Surgery -UoN
Mhadhiri mwandamizi katika Idara ya upasuaji, Chuo Kikuu cha Nairobi
Mshauri Mkuu wa upasuaji wa jumla, Hospitali ya Kitaifa ya Kenyatta
P.O. Sanduku 19676 KNH, Nairobi 00202

SEHEMU YA PILI: **FOMU YA IDHINI**

Dhibitisho la kibali cha kuingizwa katika utafiti huu inapewa na Dk / Prof.....kwa kuwa nimeelewa lengo, faida na hatari zinazohusiana na kuingizwa kwangu kwenye utafiti huu.

Saini ya mhojiwa .....
Tarehe.....

Mpelelezi mkuu: Dk. Warui J Kamau
Taasisi: Chuo Kikuu cha Nairobi, Kitivo cha sayansi ya afya, Idara ya upasuaji.

Sehemu ya tatu: **TAARIFA YA MTAFITI**
Nimeelezea katika karatasi ya habari maelezo muhimu kuhusu utafiti kwa mhojiwa kushiriki, na kwa uwezo wangu wote nilihakikisha kuwa mshiriki anaelewa yafuatayo:
• Habari yote iliyotolewa itatumiwa kwa usiri.
• Kukataa kushiriki katika utafiti hautadhoofisha msimamo wao wa kitaalam katika KNH au vinginevyo.
• Matokeo ya utafiti huu yanaweza kuchapishwa ili kuongeza maarifa na kusaidia kuboresha kufuata Miongozo ya ERAS katika KNH, na mahali pengine katika eneo hili ambapo kunaweza kuwa na huduma zinazofanana.

Ninathibitisha kwamba mshiriki alipewa fursa ya kuuliza maswali juu ya utafiti huo, na maswali yote yaliyoulizwa na mshiriki yamejibiwa kwa usahihi na kwa uwezo wangu wote. Ninathibitisha kwamba mtu huyo hajalazimishwa kutoa idhini, na idhini imepewa kwa uhuru na kwa hiari.
Nakala ya Fomu ya Hati ya Kujulishwa imetolewa kwa mshiriki.

Jina la mtafiti aliyechukua idhini.....
Saini ya mtafiti aliyechukua idhini.....
Tarehe.....