

Knowledge attitudes and practices of perioperative nutrition management in gastrointestinal (GIT) surgery in South Africa

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Objective: To assess the knowledge, attitudes and practices (KAPs) of dietitians and surgeons regarding perioperative nutrition management in gastrointestinal surgery.

Design: Descriptive, cross-sectional study using an online questionnaire.

Setting: South Africa.

Subjects: Dietitians ($n = 67$) and surgeons ($n = 35$) in South Africa working with patients receiving gastrointestinal surgery.

Outcomes measured: An online questionnaire was developed to investigate the KAPs of dietitians and surgeons. The recommended surgical nutrition guidelines were the foundation for the knowledge questions. Open-ended questions were used for practices while attitudes were assessed via a 4-point Likert scale.

Results: Dietitians had a mean knowledge score of 57.6% (SD 1.68) with surgeons having a mean knowledge score of 64.4% (SD 1.27). Dietitians and surgeons typically fasted their patients from solids preoperatively at a mean of 7.5 hours (SD 4.33) and 6 hours (SD 0), respectively. Both groups delayed reinitiating nutrition postoperatively; dietitians by 8.3 hours (SD 11.6) and surgeons by 9 hours (SD 10.2). Regarding knowledge of reinitiating nutrition, a significant difference was found between knowledge and practice for dietitians ($p = 0.007$) and surgeons ($p = 0.017$). More than half (54.4%) of dietitians receive late referrals while 88.6% of surgeons operate on malnourished patients.

Conclusion: Although surgeons displayed a slightly higher level of knowledge, both healthcare professionals appear committed to ensuring effective nutritional practices, emphasising the vital role of nutrition in improving patient outcomes after surgery. Future efforts should focus on bridging the knowledge gap identified, enhancing training for healthcare providers, and fostering team-based approaches to pre- and postoperative nutritional care.

Keywords attitudes, dietitian, gastrointestinal, knowledge, nil per mouth, perioperative, practice, surgeon

Introduction

Perioperative nutrition is the nutrition management before, during and after surgery. It plays an important role in reducing postoperative complications and reducing hospital stays.¹ In 1997, Henri Kehlet pioneered a concept called 'fast-track surgery'.² It was demonstrated by applying evidence-based perioperative principles to open colonic surgery. This concept became popular in 2010 when the Enhanced Recovery After Surgery (ERAS) programme was implemented across many hospitals.² ERAS is based on a protocol that optimises recovery in surgical patients and reduces hospital length of stay.² This is achieved through a multimodal perioperative approach using three main components, which include preoperative, intraoperative and postoperative care.^{2,3} These components involve nutrition optimisation, reduced fasting, reduced opioid prescription and early mobilisation.^{2,3} The programme also uses a multidisciplinary team (MDT) approach that includes surgeons, dietitians, anaesthesiologists and nurses.² Even though ERAS might not yet be used in all areas of surgery, there is sufficient evidence to justify applying the ERAS principles in all surgical specialities.^{2,3}

Preoperative nutrition is an important part of rehabilitation before surgical intervention. The literature defines preoperative optimisation as a multimodal process during which patients improve their diet, become physically fit and get good rest.¹ Strength training and a healthy diet are key to maintaining a good physiological reserve and promote recovery following

surgery.⁴ The ERAS programme also includes psychological preparation and encourages cessation of smoking.⁵ Historically, patients have been starved for extended periods before surgery, and this, unfortunately, is still often practised due to fear of complications.⁶ The ERAS guidelines and the European Society for Clinical Nutrition and Metabolism (ESPEN) perioperative guidelines state that patients should be kept nil per mouth (NPM) from solids 6 hours before surgery and from clear liquids 2 hours before surgery.^{1,7}

Malnutrition, along with prolonged fasting before surgery, is one of the contributing factors to delayed postoperative homeostasis.³ A prospective observational study by Gillis and Carli (2015)⁸ suggested that patients who are undernourished or at risk of undernutrition are twice as likely to be readmitted within 30 days following elective colorectal surgery. In support of this, the three most common reasons for 30-day hospital readmission following general surgery were reported to be gastrointestinal complications, surgical infections and malnutrition.⁸ This contributes to an increase in hospital expenses as the rate of readmission increases due to malnourished surgical patients.³

The ESPEN guideline recommends 7–14 days of preoperative nutritional optimisation even if surgery has to be delayed.^{7,9} Patients who are identified as at high nutritional risk should be nutritionally optimised for at least 14 days before their surgery.⁷ Unfortunately, malnutrition is often overlooked, unrecognised, or not addressed timeously. A survey among

Turkish surgeons revealed that 89.5% of surgeons implemented nutritional screening, but only 24.6% screened every patient for malnutrition, and only 25.5% started nutritional support early preoperatively.¹⁰ Although a variety of screening tools are available, this does not mean more screening is being done; too many options can create confusion among healthcare workers.¹¹ Therefore standardisation will ensure better practice.

A previous (unpublished) South African study done in a tertiary public hospital in the Western Cape province revealed that healthcare workers (dietitians, surgeons, nurses and anaesthetists) had poor knowledge of perioperative nutrition management, with a mean score of 36.0%.¹² Similarly, a recent study from Senegal revealed that 75.6% of surgeons had poor knowledge on perioperative nutrition.¹³ Healthcare workers who adhered better to guidelines were those who attended scientific meetings regularly and those with more than five years of work experience.¹⁰ As ERAS becomes more popular across wider surgical disciplines, improving insight into perioperative KAPs would allow researchers to identify persistent knowledge gaps. Against a backdrop of limited local data, this study set out to assess the KAPs of dietitians and surgeons regarding perioperative nutrition management in gastrointestinal surgery. This study can hopefully assist in better understanding local management practices regarding perioperative nutrition and allow for improvement in both clinical practice and future research.

Methodology

This cross-sectional study used electronic questionnaires to collect data. Two questionnaires were developed, one for surgeons and one for dietitians in South Africa. The questionnaires were used to gather information on perioperative nutrition management in these groups.

Ethical considerations

The study was approved by the HREC at Stellenbosch University (Ethics reference number: S23/07/149). An electronic/online consent form was included at the beginning of each questionnaire. Participation was voluntary, and participants would click for consent and only then be directed to the questionnaire. The consent form included information regarding the study aims, objectives, risks and questionnaire length. Refusal to participate or withdrawal from the study was the participant's right and did not result in negative consequences for the participant.

Participants gave informed consent and completed anonymous questionnaires. Only completed forms were included. Data were anonymized with assigned numbers. A draw for two R500 Takealot vouchers incentivized participation; email addresses were used solely for the draw and excluded from analysis.

Study population

The study population includes dietitians and surgeons who currently work and have previously worked with gastrointestinal surgical patients in South Africa. Both are registered with the health professions council of South Africa (HPCSA). Dietitians and surgeons who have not worked in this area were not included.

Self-administered online questionnaire

The questionnaires were based on a previous ERAS study conducted at a tertiary public hospital in the Western Cape province, South Africa.¹² The questionnaires were adapted to

align with research pertaining to this study and the study objectives. The questionnaire was based on the most recent ESPEN perioperative guidelines.⁷ SUNSurvey, an electronic questionnaire tool available from Stellenbosch University, was used for the online survey. Once the questionnaire was created, a pilot study was run to test its content validity and face validity. The questionnaires comprised four sections related to demographics, knowledge, attitudes and practices, which took approximately 15 minutes to complete. The questionnaires included a range of multiple-choice, 4-point Likert-scale and limited open-ended questions.

The content validity was assessed by a surgical consultant in general surgery, and the head of a dietetics department at a tertiary hospital. Minor amendments were made according to their feedback given. The face validity was tested by three student dietitians and three medical interns. Once changes were made, an advertisement was created containing a link and QR code to the questionnaire. Permission to share the questionnaire with a broader database of dietitians and surgeons was granted by different associations and societies. The advertisement was sent through to the Association of Dietetics South Africa (ADSA), the South African Society of Parenteral and Enteral Nutrition (SASPEN), the South African Gastroenterology Society (SAGES), and the Association of Surgeons South Africa (ASSA). The advertisement was distributed via email and social media. ADSA and ASSA sent weekly reminders due to low initial response. The survey stayed open for an extra month, and the advert was also shared with eligible colleagues and contacts.

Sample size

The sample size was calculated by establishing a 95% confidence interval for estimating a proportion and an 8% margin of error. A sample size of 106 participants was determined to be needed to achieve this margin of error and to represent the target population.

Data collection

The study involved distributing a self-administered online survey to dietitians and surgeons across South Africa. The data collection took place over 2 months.

Data analysis

SUNSurvey quantitative data were exported to Microsoft Excel 2022 version 16.61 (Microsoft Corp, Redmond, WA, USA); Statistica Version 14.0 (<https://www.statsoft.pl/en/software/statistica/>) was used for statistical analysis. The variables were described using summary statistics and basic descriptive statistics. Histograms and/or frequency tables were used to display the variable distributions. For both continuous and ordinal data, the central location was measured by means, while standard deviations showed the spread.

The scores from the knowledge questionnaire were totalled and categorised using the Bloom's taxonomy model cut-offs.¹⁴ Dietitians were classified as having excellent knowledge if their score was 80% or above, good knowledge if their score was 60% or above, and poor knowledge if their score was less than 60%. Surgeons with scores above 80% demonstrated excellent knowledge, those with scores of 50% or higher showed good knowledge, and those with scores below 50% had poor knowledge. Minor adaptations were made to the cut-offs a priori between groups as dietitians are considered the experts in nutrition.

Results

Demographic information

A total of 102 participants consisting of dietitians ($n = 67$) and surgeons ($n = 35$) from different provinces in South Africa participated in the study. The mean age of dietitians and surgeons was 29 years (SD 6.42), and 38 years (SD 7.18), respectively. Most participating dietitians (59.7%; $n = 40$) practised in the private sector, and most participating surgeons (71.4%; $n = 25$) practised in the public sector (Table 1). The dietitians had a mean of 11.2 years (SD 5) of experience in their field, and the surgeons had a mean of 7.8 years (SD 6.3) of experience practising as surgeons (Table 1).

Knowledge results

Overall, 13% ($n = 9$) of dietitians had an excellent knowledge score, 38.8% ($n = 26$) had a good knowledge score and 47.8% ($n = 32$) had a poor knowledge score. Fewer surgeons had excellent knowledge (5.7%; $n = 2$); however, 77.1% ($n = 27$) had good knowledge, and 17.1% ($n = 27$) had a poor knowledge score. Dietitians had a significantly lower mean knowledge score (57.6%, SD 1.68) compared with surgeons (64.4%, SD 1.27) ($p = 0.043$).

Most dietitians (71.6%; $n = 48$) knew that patients should be kept from solids 6 hours before surgery (Table 2; Question 1). Eighteen per cent ($n = 12$) thought patients should be kept 12 hours NPM, and a few answered 24 hours NPM or 'no fasting needed' or 'I don't know'. Almost all the surgeons (97.2%; $n = 34$) knew that patients should be kept NPM 6 hours from solids before surgery, and the remaining answered 12 hours. Dietitians and surgeons both had excellent knowledge on abstaining from clear liquids before surgery, with

91% ($n = 61$) of dietitians and 91% ($n = 32$) of surgeons answering correctly (Table 2, Question 2).

Only 17.9% ($n = 12$) of dietitians and 9.0% ($n = 3$) of surgeons correctly answered Question 4 regarding initiation of nutrition after surgery. Preoperative optimisation was the topic of Question 9, and 40.0% ($n = 14$) of surgeons and 43.3% ($n = 29$) of dietitians answered it correctly. Both dietitians and surgeons had better preoperative nutrition knowledge compared with post-operative nutrition management.

The knowledge scores in the different sectors revealed that most dietitians who scored well were from the private sector, of which 20% ($n = 14$) had good knowledge and 13.4% ($n = 9$) had excellent knowledge. The majority (60.0%; $n = 21$) of the surgeons from the public sector had a good knowledge score. In this study, knowledge categories were not impacted by years of clinical experience (Kruskal-Wallis; $p = 0.393$ for dietitians and $p = 0.981$ for surgeons). Furthermore, knowledge scores were also not significantly correlated with years of professional experience among surgeons (Pearson's $r = 0$, $p = 0.98$) or dietitians (Pearson's $r = 0.17$, $p = 0.18$).

Most dietitians (95.5%; $n = 65$) reported being familiar with the ESPEN perioperative nutrition recommendations, while 97% ($n = 64$) were aware of the ERAS perioperative guidelines or had attended related talks. Similarly, most surgeons reported awareness of these guidelines, with 82.9% ($n = 29$) familiar with ESPEN and 97.1% ($n = 34$) aware of ERAS (see Table 1).

Practices

Both groups were asked to complete a Likert scale regarding their practices (selected findings displayed in Table 3). Some 57% ($n = 20$) of surgeons reported 'always' referring malnourished patients to a dietitian before surgery, yet only 5.9% ($n = 4$) of dietitians report 'always' receiving a referral (Table 3); 15% ($n = 10$) report 'never' receiving a referral for preoperative optimisation (Table 3). Most dietitians (85.0%; $n = 57$) report receiving referrals, of which 54.4% ($n = 31$) typically receive it less than a week before surgery; 21% ($n = 12$) receive referrals a week prior and 15.8% ($n = 9$) a month before surgery; the remainder reported other timings.

Despite many surgeons reporting that there was an ERAS programme in their hospital, only 54.3% ($n = 19$) request a carbohydrate drink for their ERAS patients preoperatively. Almost a quarter of dietitians (22.4%; $n = 15$) report 'never' receiving the opportunity to nutritionally optimise a patient before surgery and two-thirds (65.7%; $n = 44$) report 'sometimes' receiving the opportunity for preoperative optimisation. There are also many surgeons (88.6%; $n = 31$) who still report operating on patients who are malnourished. When comparing their strong beliefs with practices in preoperative optimisation there was no statistical significance found ($p = 0.69$).

In total, 52% ($n = 35$) of dietitians screen for malnutrition on admission while the rest do not. A quarter of surgeons (25.7%; $n = 9$) report 'always' screening for malnutrition prior to booking for surgery and 8.6% ($n = 3$) report 'never' screening for malnutrition (Table 3).

Surgeons who screen for malnutrition reported using the following to identify nutritional risk: 68.5% ($n = 25$) use BMI; 54.3% ($n = 19$) use albumin; 48.6% ($n = 17$) use nutritional

Table 1: Demographics of dietitians and surgeons

Variables	Dietitians		Surgeons	
	<i>n</i>	(%)	<i>n</i>	(%)
Female	64	95.5	12	34.3
Male	3	4.5	23	65.7
Western Cape	34	50.7	28	80.0
Eastern Cape	4	6.0	3	8.6
Kwazulu-Natal	2	3.0	2	5.7
Gauteng	17	25.4	1	2.9
Northern Cape	1	1.5	1	2.9
Free State	7	10.4	0	0.0
Mpumalanga	2	3.0	0	0.0
Private	40	59.7	2	5.7
Public	15	22.4	25	71.4
Both	12	17.9	8	22.9
Aware of ESPEN guidelines	65	97.0	29	82.9
Unaware of ESPEN guidelines	2	3	6	17.1
Read literature on/had training on ERAS	64	95.5	34	97.1
Have not read literature/training on ERAS	3	4.5	1	2.9
Variables	Mean (SD)		Mean (SD)	
Age in years	29 (6.42)		38 (7.18)	
Years of experience in their profession	11.2 (5)		7.8 (6.30)	

ESPEN European Society for Clinical Nutrition and Metabolism; ERAS: Enhanced Recovery After Surgery.

Table 2: Knowledge scores of dietitians and surgeons for specific questions

Questions (knowledge)	Dietitians <i>n</i> = 67 Correct answers <i>n</i> (%)	Surgeons <i>n</i> = 35 Correct answer <i>n</i> (%)
(1) How many hours should a patient be kept fasted or NPM from solid food before elective surgery?	48 (71.6)	34 (97.0)
(2) How many hours should a patient be kept fasted or NPM from clear fluids before elective surgery?	61 (91.0)	32 (91.0)
(3) After elective general surgery how soon should nutrition be initiated?	30 (44.8)	20 (57.0)
(4) After gastrointestinal surgery what is the longest time one should wait before initiating nutrition?	12 (17.9)	3 (9.0)
(5) When would you consider enteral nutrition if oral intake is not achieved in an admitted perioperative nutritionally at-risk patient?	23 (34.3)	5 (14.0)
(6) What nutrition support should an ERAS patient receive 2 hours prior to elective GIT surgery?	62 (92.5)	32 (91.0)
(7) Select the correct order of feeding from 1–4 (oral, nasogastric, nasojejunal, and parenteral feeding) that would be most appropriate for a severe acute pancreatitis patient	41 (61.2)	29 (83.0)
(8) If a patient has a prolonged postoperative ileus, what would be the most appropriate nutritional management?	57 (85.1)	32 (91.0)
(9) What is the minimum recommended amount of time a patient should be nutritionally optimised preoperatively?	29 (43.3)	14 (40.0)
(10) What should a carbohydrate drink ideally consist of before elective ERAS surgery?	23 (34.3)	*

NPM: Nil per mouth; ERAS: Enhanced Recovery After Surgery. * Question not included for surgeons.

history; 2.9% (*n* = 1) use bioelectrical impedance (BIA) and the rest (2.9%; *n* = 1) reported using 'other' screening tools. Most dietitians (85.1%; *n* = 58) report using nutritional history; 74.6% (*n* = 54) use BMI; 37.3% (*n* = 28) use albumin; 37.3% (*n* = 27) use mid-upper arm circumference; 23.9% (*n* = 16) use BIA; only 22.4% (*n* = 16) use Nutrition Risk Screening-2002 (NRS-2002) and 4.5% (*n* = 3) use Global Leadership Initiative on Malnutrition (GLIM) criteria whilst the rest (11.9%; *n* = 8) report using 'other' screening tools. Dietitians and surgeons also selected more than one parameter, indicating a combination of tools and parameters used for screening.

Practices and knowledge

Dietitians kept patients NPO for an average of 7.5 hours (SD 4.3) from solids and 3.4 hours (SD 3.0) from liquids, while surgeons averaged 6 hours from solids and 3.2 hours (SD 0) from liquids (SD 1.8) (Table 4). Postoperatively, nutrition was reinitiated at a mean of 8.3 hours (SD 11.6) by dietitians and 9 hours (SD 10.2) by surgeons, with few following ERAS guidelines (Table 4).

When considering practices regarding relevant knowledge scores, there was a discrepancy between the two (see Table 4). In this respect, 71% of dietitians knew that patients should be kept 6 hours NPM from solids prior to surgery; however, less than half (43.2%; *n* = 29) practised this. A significant difference was found between knowledge and practice (*t*-test, *p* < 0.001). Some 97% of surgeons (*n* = 32) knew these guidelines and 80% (*n* = 28) practised them. Despite 91% (*n* = 61) of dietitians knowing that patients should be kept 2 hours NPM from liquids prior to surgery, 65.6% (*n* = 44) of dietitians keep their patients NPM from liquids as per the guidelines. No significant difference was found between knowledge and practices of keeping patients NPM from liquids amongst dietitians (Mann-Whitney *U*, *p* = 0.112). However, 91.5% of surgeons knew that patients should be kept only 2 hours NPM from liquids and only 57.0% (*n* = 20) practised this, which proved to be statistically significant (*p* < 0.001). Dietitians keep their patients an additional 1.4 hours NPM from liquids, while 57% (*n* = 20) of surgeons kept their patients' NPM from liquids for 2 hours as per the guidelines.

When analysing the initiation of nutrition, 44.8% (*n* = 30) of dietitians knew that patients should be started on nutrition immediately after surgery; 31.3% (*n* = 21) answered 4 hours post-surgery, and the rest answered 12 hours or more or 'I don't know'. Only 25.3% (*n* = 17) of dietitians start nutrition immediately post-surgery. The minority (17%; *n* = 6) of surgeons initiate feeds immediately after surgery with most surgeons initiating nutrition within 6 hours. Regarding knowledge of reinitiating nutrition, the results indicated a significant difference between knowledge and practice for dietitians (Mann-Whitney *U*, *p* = 0.007) and surgeons (Mann-Whitney *U*, *p* = 0.017).

Both groups were asked to answer a four-point Likert scale concerning their attitudes towards perioperative nutrition practices. In this regard, 90% (*n* = 60) of dietitians and 80.0% (*n* = 28) of surgeons strongly agree that improving a patient's nutritional status in the weeks leading up to surgery is a useful intervention to improve surgical outcomes. Both strongly agree (dietitians [94.0%; *n* = 63] and surgeons [80.0%; *n* = 28]) on the importance of a well-nourished patient for a good recovery. Thus 97% (*n* = 65) of dietitians and 82.7% (*n* = 29) of surgeons strongly agree that a patient's nutritional status prior to surgery has an influence on their recovery after surgery.

Most surgeons feel that there is enough evidence to support the reduction of preoperative fasting; however, 51.4% (*n* = 18) agree, and 34.3% (*n* = 12) strongly agree that they have no control over the time patients are kept NPM. The difference in practice and attitudes for resumption of nutrition was, however, not statistically significant (*p* = 0.672). Figures 1 and 2 depict that the majority of dietitians (43.3%; *n* = 29) and surgeons (54.3%; *n* = 19) disagree and strongly disagree (40.3%; *n* = 27, 28.6%; *n* = 10) respectively that the fasting time of patients before surgery has no bearing on their post-surgery recovery. There are still some dietitians and surgeons who strongly agree and agree that it does not make a difference to recovery. Just over half of surgeons (51.4%; *n* = 18) agree that the ERAS guidelines do not consider the individual patient and do not allow for the physician's best judgement in a specific situation. The dietitians do not feel the same: 49% (*n* = 33) disagree and 16% (*n* = 11) strongly disagree.

Table 3: Practices of dietitian and surgeons (selected findings)

Dietitians n = 67	Never n (%) (1)	Sometimes n (%) (2)	Most times n (%) (3)	Always n (%) (4)	Mean	Mode	SD
Optimise malnourished patients	15 (22)	44 (66)	4 (6)	4 (6)	1.96	2	0.73
Referral from doctors	10 (15)	42 (63)	11 (16)	4 (6)	2.13	2	0.74
Early postoperative nutrition	4 (6)	40 (60)	15 (22)	8 (12)	2.40	2	0.78
Nutritional screening in practice	5 (7)	21 (31)	13 (20)	28 (42)	2.96	4	1.02
Surgeons n = 35	Never n (%) (1)	Sometimes n (%) (2)	Most times n (%) (3)	Always n (%) (4)	Mean	Mode	SD
Referring to dietitian preoperatively	0 (0)	7 (20)	8 (23)	20 (57)	3.37	4	0.81
Screen patients for malnutrition	3 (8)	16 (46)	7 (20)	9 (26)	2.63	2	0.97
Prescribe nutritional supplements	7 (20)	17 (49)	6 (17)	5 (14)	2.26	2	0.95
Surgical interventions on malnourished patients	1 (3)	31 (89)	3 (8)	0 (0)	2.06	2	0.34

Key: Never = 1, Sometimes = 2, Most times = 3, Always = 4.

Discussion

This study investigated the KAPs of surgeons and dietitians on perioperative nutrition. The importance of clinical nutrition and its vital role in perioperative care is often overlooked. This study aims at giving further insight into perioperative care in a South African setting.

Knowledge

Perioperative nutrition knowledge did not fully measure up to awareness of guidelines, and practices are still not being implemented optimally under these guidelines. The mean knowledge scores of both groups (57.6% for dietitians and 64.4% for surgeons) were below expectations. The difference in scores were found to be significant ($p = 0.044$); however, it is important to bear in mind the difference in participation numbers between the two groups.

A similar but older study conducted among healthcare workers (dietitians, nurses and anaesthetists) at a tertiary hospital in South Africa revealed a mean knowledge score of 36.0% (SD 27.7) on ERAS guidelines at the time.¹² The majority (67%) of participants scored poorly (< 50%),¹² with participants who reported having read the ERAS guidelines or attended talks on the topic achieving a higher score of 60.3%.¹² Despite the growing body of research evidence and the rising availability of courses and information, it does not address real-world problems related to implementing science-based concepts.¹⁵ These results confirm a slow adaptation to new evidence, resulting in a constant knowledge–practice gap.¹⁵ The concepts of perioperative nutrition and ERAS are widely recognised within the surgical community; however, the level of knowledge regarding these topics within the South African context appears to fall short of the expected standard. Furthermore, individuals with knowledge may not always have translated this knowledge into practice. This is shown by the comparison of knowledge and practice in this study regarding the reinitiation of nutrition, where statistically significant differences were observed for both dietitians and surgeons.

Screening practices and attitudes

In this study, half of the dietitians reported conducting patient screening upon admission, while fewer than half indicated that they routinely perform screening. This trend may be attributed to the predominance of participants working in the private

sector. Dietitians in private practice in South Africa often lack the opportunity to conduct routine screening, as their services are primarily based on patient referrals. More surgeons reported screening in general, but a few reported routine screenings. Their lack of screening does not, however, align with their strong beliefs in preoperative optimisation. A previous South African ERAS study revealed that only 28% of healthcare providers reported screening patients.¹³ A Turkish study also revealed that surgeons participating in screening mostly screened patients whom ‘they thought to be at nutritional risk’ and only a quarter of this group screened every patient.¹⁰ This missed opportunity in the preoperative phase is costly, as malnutrition is one of the few modifiable risk factors associated with poor perioperative outcomes according to the National Surgical Quality Improvement Program of the American Association of Surgeons.¹⁶

When reviewing the types of screening done, BMI and albumin were the highest reported screening parameters among South African surgeons, and none were reported using validated screening tools, such as the NRS-2002. The dietitians used a wider variety of parameters, with the most frequent being nutrition history, BMI and albumin. Low albumin often indicates high levels of catabolism rather than undernutrition. Low albumin alone is not enough of an indicator and should be combined with prealbumin levels as well as other parameters to identify malnutrition.¹⁷

The lack of standardising of nutritional screening internationally is a barrier that healthcare workers face. This is often how patients are missed for an opportunity to be optimised; screening tools, such as NRS-2002, Malnutrition Universal Screening Tool (MUST) or the Mini Nutritional Assessment (MNA), identify the percentage of weight loss and decreased oral intake even if the current BMI is normal. The surgeons’ awareness of these tools needs improvement; however, with only 47.8% of dietitians screening for malnutrition routinely on admission, an improvement across all healthcare providers is required. Implementing the Global Leadership Initiative on Malnutrition (GLIM) consensus criteria for diagnosing malnutrition is a critical first step towards improving screening practices.¹⁸

With nearly two-thirds of African patients at risk of malnutrition, the absence of routine screening is not just a gap – it is a crisis.¹⁹ Despite this, a US national survey revealed that only 38% of

Table 4: Knowledge and related practices of dietitians and surgeons with regards to keeping patients NPM

Questions		Knowledge n (%)	Practices n (%)	Average time kept NPO Hr (SD)
Dietitians	How many hours do you advise your patients to abstain from solids prior to elective gastrointestinal surgery? <i>Correct answer: 6 hours</i>	48 (71.6)	29 (43.2)	7.5 (4.3)
Surgeons		34 (97.2)	28 (80)	6 (0)
Dietitians	How many hours do you advise your patients to abstain from clear liquids prior to elective gastrointestinal surgery? <i>Correct answer: 2 hours</i>	61 (91)	44 (65.6)	3.5 (3.0)
Surgeons		61 (91.4)	20 (57)	3.2 (1.8)
Dietitians	How many hours do you wait to initiate nutrition after elective gastrointestinal surgery? <i>Correct answer: Immediately</i>	38 (44.8)	17 (25.3)	8.3 (11.6)
Surgeons		20 (57.1)	6 (17)	9 (10.2)

hospitals had formal perioperative nutrition screening protocols in place, highlighting a global failure to prioritise a critical determinant of patient outcomes.²⁰ With such low global compliance in well-resourced settings, one can unfortunately anticipate a lower local compliance.

Regular training on nutrition and the importance of identifying malnutrition risk will help improve patient outcomes. Surgeons who participated in at least one scientific meeting on nutrition a year had a higher tendency to screen patients than those who did not ($p < 0.001$).¹⁰

Preoperative nutrition practices and attitudes

Although dietitians and surgeons feel very strongly about pre-operative nutrition, almost a quarter of dietitians report 'never' having the opportunity to optimise patients. Most dietitians reported only being able to optimise patients less than a week before surgery, which is less than the recommended 7–14 days for preoperative optimisation.⁷ Preoperative optimisation is multifaceted; however, it is well known that a patient's nutritional status before surgery affects post-operative outcomes, and both surgeons and dietitians agree.²¹ Concerningly, there are still many surgeons who

perform elective surgery on malnourished patients in South Africa despite the clear evidence favouring preoperative optimisation.³ This could be linked to late referrals or poor screening. Some 59% of surgeons report 'always' referring to a dietitian prior to surgery yet only 5.9% of dietitians report 'always' receiving a referral for preoptimization. Notably, most surgeons who reported consistently referring patients were employed in the public sector, whereas dietitians who reported infrequent referrals predominantly practised in the private sector. This sectoral disparity may suggest lower referral rates within the private healthcare setting. The discrepancy may also indicate an intention to make referrals, but a failure to implement them in practice.

The ESPEN practical guidelines stipulate that a patient should be kept NPM from solids 6 hours prior to surgery and NPM from liquids 2 hours prior to surgery.⁷ The surgeons managed to follow these guidelines very well, which could be linked to most surgeons being exposed to ERAS in their hospitals. A British study by El-sharkawy et al. (2021) showed patients are still starved for extended periods despite international consensus and emergency surgical cases are likely to fast more than 12 hours from clear fluids and 24 hours from food.²²

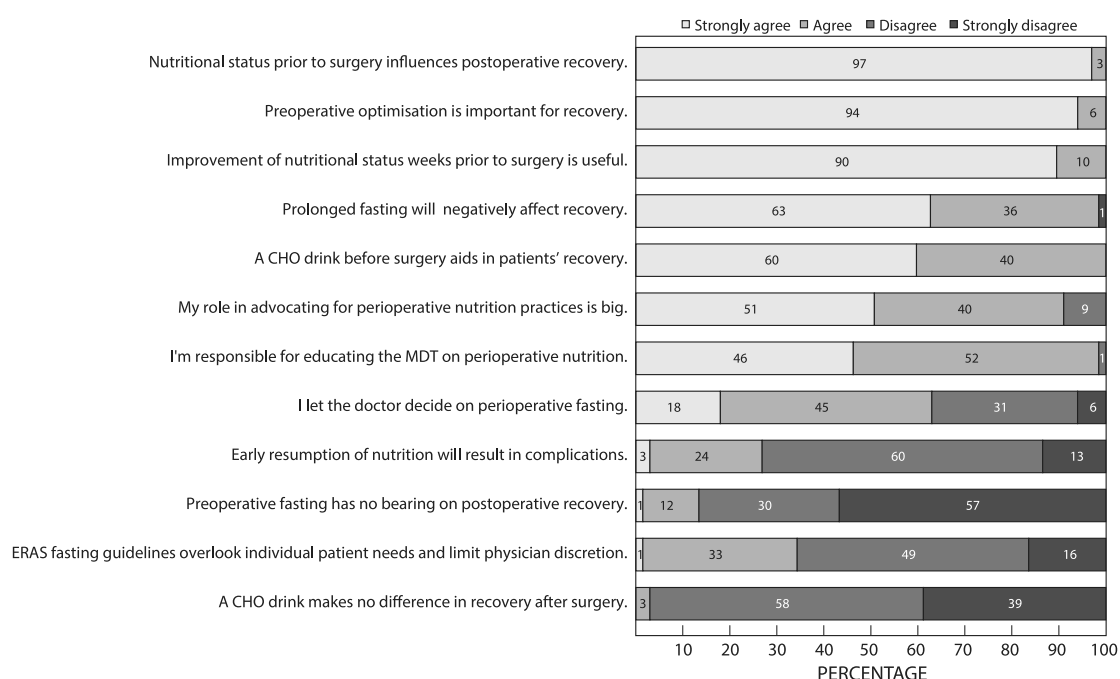


Figure 1: Dietitians' attitudes towards perioperative nutrition. CHO: carbohydrate; ERAS: Enhanced Recovery After Surgery, NPM: nil per mouth, MDT: multidisciplinary team.

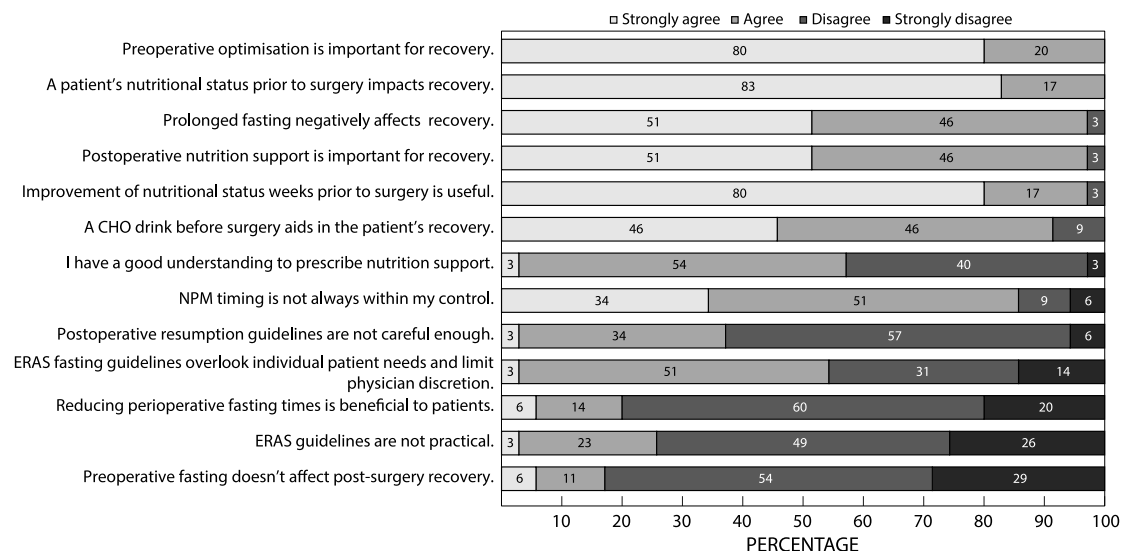


Figure 2: Surgeons' attitude towards perioperative nutrition. CHO: carbohydrate; ERAS: Enhanced Recovery After Surgery, NPM: nil per mouth.

The idea around prolonged fasting is dated, as the stomach clears liquids within 60–90 minutes, and there is no evidence to prove that a patient will be at greater risk of aspiration than those kept NPM for longer periods.⁷ The surgeons and dietitians also felt strongly that it is only 'sometimes' in their control how long a patient is kept NPM. This is especially true in the public sector, where the availability of theatre is unpredictable. The EXPERIENCE study found that the barriers to proper implementation included unpredictable theatre times, hierarchical decision-making and lack of confidence in junior staff to implement change.²³

Postoperative nutrition practices and attitudes

Although both groups strongly agree that nutrition should be initiated as soon as possible, both dietitians and surgeons initiate nutrition much later postoperatively compared with the recommended guidelines, which stipulate that nutrition should be started immediately.²⁴ The difference in practice and attitudes was, however, not statistically significant ($p = 0.672$). Two surgeons and two dietitians reported that the time at which they initiate nutrition is dependent on the type of surgery. This answer could be fair when considering the ERAS guidelines promoting immediate initiation of oral nutrition post-surgery. This may not always be practical in all forms of major gastrointestinal surgeries, which is why immediate initiation of nutrition should be considered in different forms, including enteral and parenteral, and not only oral nutrition. Caution should be taken to initiate immediate nutrition therapy postoperatively in haemodynamically unstable patients postoperatively.²⁵

Perioperative implementation

South African dietitians felt very strongly that they play a vital role in education on perioperative nutrition practice and are responsible for advocating for these practices. Surgeons also felt they had enough nutrition knowledge to prescribe feeds to patients. The EXPERIENCE study, a European study reviewing barriers to implementation of evidence-based practice guidelines, determined that dietitians felt they had a lack of authority when it came to nutrition decisions relating to patients.²³ They described their role as being an advocate for nutrition-making decisions rather than being empowered to make and implement the decisions themselves.²³ The same study noted

that junior surgeons felt they fell under a hierarchy of decision-making.²³ This makes changing practices a lot harder as similar experiences are suspected locally. Another consideration is clinical judgement. Guidelines may not always suit every patient's individual needs, which is why there should be room for deviation from guidelines if necessary. It is important to consider this when practices are not implemented in accordance with knowledge. The major barrier identified in this study is that there is still insufficient knowledge on perioperative care, and those who possess the correct knowledge are not necessarily practising it.

Study limitations

The potential for a low response rate is a limitation of a questionnaire.²⁶ Participants may have experienced survey fatigue, thus leaving the online questionnaire before completing all sections.²⁶ The study groups are small groups of specialised HCPs. They both comprise busy healthcare workers, which could limit the time available for participation or completion of the survey, which also affects the sample size. The different number of participants between groups also impacts the different outcomes in response between groups. Some provinces did not respond, which limited the accurate representation of the South African population. Potential biases could arise due to self-reported information and the inability to clarify questions.

Conclusions and recommendations

This study has given sobering insight into the knowledge, attitude and practices in perioperative nutrition among dietitians and surgeons in South Africa. The knowledge among both groups still needs further improvement but has proved to be better than previously. As more ERAS programmes are being implemented in hospitals, more training is needed, and identifying barriers is the key to successful implementation. This study also highlights how practices among dietitians and surgeons are still not fully in accordance with the guidelines. A deeper dive into exploring the barriers to implementation would give more insight into this issue. Surgeons and dietitians are very knowledgeable regarding preoperative fasting and firmly believe in preoperative optimisation; however, there was a discrepancy in their knowledge, attitudes, and ultimately their practices.

The practice of prolonged fasting is evidently less common now than it was in the past. The amount of time that patients were kept NPM from liquids and solids was near the recommended standards. The revelation that both groups strongly believe they cannot always regulate the amount of time patients are kept NPM may potentially be a contributing factor in the absence of flawless implementation. Improvement in post-operative nutrition initiation is important, as nutrition is still being withheld for too long. The international perioperative guidelines need more clarity on categories of postoperative initiation of nutrition. Feeding of any type should be initiated immediately postoperatively, without delay.⁷ Perioperative protocols in these settings would also allow for the standardisation of practices.

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References

- Lobo DN, Gianotti L, Adiamah A, et al. Perioperative nutrition: recommendations from the ESPEN expert group. *Clin Nutr.* 2020;39(11):3211–3227. <https://doi.org/10.1016/j.clnu.2020.03.038>
- Mithany RH, Daniel N, Shahid MH, et al. Revolutionizing surgical care: the power of enhanced recovery after surgery (ERAS). *Cureus.* 2023;15(11):e48795. <https://doi.org/10.7759/cureus.48795>
- Gillis C, Ljungqvist O, Carli F. Prehabilitation, enhanced recovery after surgery, or both? A narrative review. *Br J Anaesth.* 2022;128(3):434–448. <https://doi.org/10.1016/j.bja.2021.12.007>
- Silver JKM, Baima JM. Cancer prehabilitation an opportunity to decrease treatment-related morbidity, increase cancer treatment options, and improve physical and psychological health outcomes. *Am J Phys Med Rehabil.* 2013;92(8):715–727. <https://doi.org/10.1097/PHM.0b013e31829b4afe>
- Gianotti L, Sandini M, Romagnoli S, et al. Enhanced recovery programs in gastrointestinal surgery: actions to promote optimal perioperative nutritional and metabolic care. *Clin Nutr.* 2020;39(7):2014–2024. <https://doi.org/10.1016/j.clnu.2019.10.023>
- Hirsch KR, Wolfe RR, Ferrando AA. Pre- and post-surgical nutrition for preservation of muscle mass, strength, and functionality following orthopedic surgery. *Nutrients.* 2021;13(5):1675. <https://doi.org/10.3390/nu13051675>
- Weimann A, Braga M, Carli F, et al. ESPEN practical guideline: clinical nutrition in surgery. *Clin Nutr.* 2021;40(7):4745–4761. <https://doi.org/10.1016/j.clnu.2021.03.031>
- Gillis C, Carli F. Promoting perioperative metabolic and nutritional care. *Anesthesiology.* 2015;123(6):1455–1472. <https://doi.org/10.1097/ALN.0000000000000795>
- Gianotti L, Biffi R, Sandini M, et al. Preoperative oral carbohydrate load versus placebo in major elective abdominal surgery (PROCY). *Ann Surg.* 2018;267(4):623–630. <https://doi.org/10.1097/SLA.0000000000002325>
- Bozkirli BO, Gündoğdu RH, Akbaba S, et al. Surgeons' approach toward clinical nutrition: a survey-based study. *Turkish J Surg.* 2017;33(3):147–152. <https://doi.org/10.5152/turksurg.2017.3586>
- Bellanti F, Lo Buglio A, Quiete S, et al. Comparison of three nutritional screening tools with the new glim criteria for malnutrition and association with sarcopenia in hospitalized older patients. *J Clin Med.* 2020;9(6):1898. <https://doi.org/10.3390/jcm9061898>
- Visser J, Kotlowitz J, Kriel J, et al. SUN-P272: assessment of the implementation of the perioperative nutrition eras guidelines in elective colorectal surgery patients in a tertiary hospital in South Africa. *Clin Nutr.* 2017;36:S154. [https://doi.org/10.1016/s0261-5614\(17\)30358-8](https://doi.org/10.1016/s0261-5614(17)30358-8)
- Togtoga L, Ndong A, Niang K. Surgeons' knowledge of perioperative nutrition. *J Med Surgery, Public Heal.* 2024;2:100039. <https://doi.org/10.1016/j.glm.2023.100039>
- Bloom B (editor). *Taxonomy of Educational Objectives: Handbook I: The Cognitive Domain.* New York: McKay Co Inc; 1956.
- Westerlund A, Sundberg L, Nilsen P. Implementation of implementation science knowledge: the research-practice gap paradox. *Worldviews Evidence-Based Nurs.* 2019;16(5):332–334. <https://doi.org/10.1111/wvn.12403>
- He M, Long Y, Peng R, et al. Epidemiology, controversies, and dilemmas of perioperative nutritional risk/malnutrition: a narrative literature review. *Risk Manag Healthc Policy.* 2025;18:143–162. <https://doi.org/10.2147/RMHP.S496098>
- Weimann A, Braga M, Carli F, et al. ESPEN guideline: clinical nutrition in surgery. *Clin Nutr.* 2017;36(3):623–650. <https://doi.org/10.1016/j.clnu.2017.02.013>
- Cederholm T, Jensen GL, Correia MITD, et al. GLIM criteria for the diagnosis of malnutrition – A consensus report from the global clinical nutrition community. *J Cachexia Sarcopenia Muscle.* 2019;10(1):207–217. <https://doi.org/10.1002/jcsm.12383>
- Blaauw R, Achar E, Dolman RC, et al. The problem of hospital malnutrition in the African continent. *Nutrients.* 2019;11(208):2028. <https://doi.org/10.3390/nu11092028>
- Williams JD, Wischmeyer PE. Assessment of perioperative nutrition practices and attitudes – A national survey of colorectal and GI surgical oncology programs. *Am J Surg.* 2017;213(6):1010–1018. <https://doi.org/10.1016/j.amjsurg.2016.10.008>
- West MA, Wischmeyer PE, Grocott MPW. Prehabilitation and nutritional support to improve perioperative outcomes. *Curr Anesthesiol Rep.* 2017;7(4):340–349. <https://doi.org/10.1007/s40140-017-0245-2>
- El-sharkawy AM, Daliya P, Lewis-Lloyd C, et al. Fasting and surgery timing (FaST) audit. *Clin Nutr.* 2021;40:1405–1412. <https://doi.org/10.1016/j.clnu.2020.08.033>
- Byrnes A, Young A, Mudge A, et al. EXploring practice gaps to improve PERioperative nutrition CarE (EXPERIENCE study): a qualitative analysis of barriers to implementation of evidence-based practice guidelines. *Eur J Clin Nutr.* 2019;73(1):94–101. <https://doi.org/10.1038/s41430-018-0276-x>
- Gundogdu RH. Current approach to perioperative nutrition in the ERAS age. *Clin Sci Nutr.* 2019;1(1):1–10. <https://doi.org/10.5152/clinscitr.2019.79>
- Singer P, Blaser AR, Berger MM, et al. ESPEN guideline on clinical nutrition in the intensive care unit. *Clin Nutr.* 2019;38(1):48–79. <https://doi.org/10.1016/j.clnu.2018.08.037>
- Saleh A, Bista K. Examining factors impacting online survey response rates in educational research: perceptions of graduate students. *J Multidiscip Eval.* 2017;13(29):63–74. <https://doi.org/10.56645/jmde.v13i29.487>

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