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Development of an Evidence-Informed Early Oral Feeding Intervention Protocol for Patients Undergoing Colorectal Cancer Surgery: A Delphi Consensus Study

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Abstract: This study aimed to develop an evidence-informed early oral feeding (EOF) intervention protocol for patients undergoing colorectal cancer surgery. Based on a previously completed evidence synthesis, an initial protocol was developed and refined through a two-round Delphi survey involving experts in gastrointestinal surgery and nutrition. Seventeen experts were invited, and 15 completed both rounds, with response rates of 88% and 100%, respectively. The coefficients of expert authority were 0.95 and 0.94, and Kendall's W coefficients were 0.114 and 0.218, respectively ($p = 0.002$ and $p < 0.001$). After two rounds of consultation, a protocol comprising 6 first-level and 37 second-level items was developed, covering nutritional risk screening and assessment, nutritional therapy, energy and protein management, staged oral feeding, and postoperative feeding tolerance assessment and management. The protocol provides a structured, evidence-informed approach to EOF implementation and may facilitate its standardized clinical application.

Keywords: Colorectal cancer; Early oral feeding; Perioperative nursing; Protocol development; Delphi method

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1.Introduction

Early oral feeding (EOF) after surgery is a core component of enhanced recovery after surgery (ERAS) [1].

Initiating EOF within 24 hours after surgery is safe and feasible and may improve nutritional status, promote gastrointestinal recovery, shorten hospital stay, and reduce healthcare costs, without increasing the risk of complications such as anastomotic leakage, nausea, or vomiting [2–6]. However, EOF implementation remains suboptimal, with an overall oral nutritional supplement adherence rate of only 63.93% among patients after colorectal cancer surgery [7]. Traditional beliefs about postoperative fasting, lack of standardized procedures, and insufficient professional training are important barriers [4]. Although existing studies have addressed EOF timing and feeding tolerance, evidence-informed protocols remain limited regarding indications, energy targets, and individualized support.

Evidence-based nursing supports clinical decision-making and practice improvement, but translating evidence into practice requires consideration of multidisciplinary expertise, clinical context, and implementation feasibility [8,9]. The Delphi method facilitates consensus through iterative expert consultation and can integrate multidisciplinary expertise to support evidence translation [10].

Based on our preceding best-evidence synthesis, this study used a two-round Delphi approach to evaluate and refine an EOF intervention protocol for patients undergoing colorectal cancer surgery. The aim was to develop a standardized and clinically applicable protocol to facilitate evidence translation and optimize postoperative nutritional management.

2. Materials and methods

This study was approved by the Clinical Research and Laboratory Animal Ethics Committee of the First Affiliated Hospital of Sun Yat-sen University (Approval No. [2024]604). The study was conducted in accordance with the 1964 Declaration of Helsinki and its subsequent amendments. Written informed consent was obtained from all participating experts.

2.1. Research team

The research team comprised 8 members: 1 principal investigator, 3 experts in research design and methodology, and 4 experts in intervention protocol development. The team was responsible for evidence synthesis, protocol development and revision, expert consultation, data analysis, and final protocol development.

2.2. Development of the initial protocol

The initial protocol was developed based on our previously published best-evidence synthesis [11]. The research team integrated and operationalized the evidence according to the clinical context of EOF after colorectal cancer surgery. Two rounds of Delphi consultation were then conducted to assess the importance and clinical applicability of each item and refine the protocol based on expert feedback.

2.3. Development of the expert consultation questionnaire

The questionnaire was developed by the research team based on the evidence synthesis and comprised three sections: (1) study background, objectives, and completion instructions; (2) an expert consultation form using a 5-point Likert scale to rate item importance, with space for comments and suggested revisions; and (3) basic expert information, including demographic characteristics (omitted in the second round), familiarity with the study, and the basis for professional judgment.

2.4. Selection of experts

According to established Delphi selection principles, 17 experts in gastrointestinal surgery and nutrition from 7 cities were recruited [12]. Inclusion criteria were: (1) a bachelor's degree or above; (2) an intermediate professional title or above; (3) ≥10 years of relevant work experience; (4) a professional background in clinical medicine, gastrointestinal surgical nursing, or nutritional nursing; and (5) willingness and ability to complete two consultation rounds.

2.5. Expert consultation procedure

Questionnaires were distributed and collected by email and WeChat. After the first round, items were screened using a mean importance score > 3.5 and CV ≤ 0.25 [13]. Based on these results and expert comments, items were revised, deleted, or added, and the revised questionnaire was sent to the same experts for the second round. After the second round, consensus was considered sufficient, and the final protocol was developed.

2.6. Statistical analysis

Data were independently entered into Excel by two researchers and analyzed using SPSS version 26.0. Expert enthusiasm was assessed by response rate, and expert authority by the coefficient of expert authority (Cr), with Cr > 0.70 considered acceptable [14]. Agreement among experts was assessed using Kendall's coefficient of concordance (W), ranging from 0 to 1, with higher values indicating greater agreement [15]. Descriptive data were expressed as mean ± standard deviation, full-score rate, and frequency.

3. Results

3.1. General characteristics of the experts

Seventeen experts from 7 cities (Guangzhou, Shenzhen, Ganzhou, Nanning, Fuzhou, Xiangyang, and Shanghai) were invited to participate. Two experts failed to respond within the specified period and were considered withdrawals; therefore, 15 experts completed both rounds of consultation. The mean age was 42.87 ± 6.53 years, and the mean duration of professional experience was 19.00 ± 9.21 years. The experts were mainly specialized in gastrointestinal surgical nursing, clinical medicine, and nutritional nursing. Their general characteristics are presented in **Table 1**.

Table 1. Characteristics of the Expert Panel (n = 15)

Variable	Category	*n*	Proportion (%)
Sex	Male	3	20.00
	Female	12	80.00
Age (years)	≤ 40	7	46.67
	> 40	8	53.33
Educational level	Bachelor's degree	10	66.67
	Master's degree	3	20.00
	Doctoral degree	2	13.33
Years of professional experience	≤ 20	10	66.67
	> 20	5	33.33

Variable	Category	*n*	Proportion (%)
Professional title	Intermediate	4	26.67
	Associate senior	11	73.33
Area of expertise	Clinical medicine	5	33.33
	Gastrointestinal surgical nursing	6	40.00
	Nutritional nursing	4	26.67

3.2. Expert enthusiasm

In the first round, 17 experts were invited, and 15 completed the questionnaire, yielding an effective response rate of 88%. In the second round, the same 15 experts were invited, and all completed the questionnaire, yielding a response rate of 100%. The proportions of experts providing comments were 80% and 26%, respectively, indicating a high level of participation.

3.3. Expert authority

In the first round, the coefficients of familiarity (Ca), judgment basis (Cs), and expert authority (Cr) were 0.98, 0.92, and 0.95, respectively. In the second round, the corresponding values were 0.96, 0.92, and 0.94. The Cr values were ≥ 0.90 in both rounds, indicating a high level of expert authority.

3.4. Coordination of expert opinions

The CVs of the items ranged from 0.00 to 0.16 in the first round and from 0.00 to 0.17 in the second round, all below 0.25, indicating low dispersion in item ratings and a high degree of agreement among experts. Kendall's W values were 0.114 and 0.218 in the two rounds, respectively, and both were statistically significant, indicating that agreement among experts increased after revision of the items.

3.5. Concentration of expert opinions

The mean importance scores for all items were > 3.5 in both rounds, meeting the criteria for item retention. In the first round, the mean scores ranged from 4.73 to 5.00 for first-level items and from 4.60 to 5.00 for second-level items. In the second round, the corresponding ranges were 4.87–5.00 and 3.73–5.00, respectively, indicating a high degree of concentration of expert opinions.

3.6. Results of expert consultation

After the two rounds of consultation, the research team discussed and revised each protocol item based on the experts' written comments.

During the first round, written comments were received from 15 experts. After item-by-item review, 25 suggestions were fully or partially adopted, while 2 were not adopted: (1) adding routine postoperative intravenous fluid administration, because this was already covered by existing items and would be redundant; and (2) allowing PG-SGA and GLIM to be used interchangeably, because they serve different purposes and are not redundant. At the item level, "ONS feeding protocol" was incorporated into "feeding protocol"; the "five-step nutritional therapy" was divided into several more specific items; 4 new items were added (preoperative nutritional education, postoperative nutritional reassessment and individualized planning, introduction of diet types, and outcome evaluation); and 12 items were revised for wording [16]. No items

were deleted. Structural modifications included separating contraindications into relative and absolute contraindications; incorporating I-FEED scoring with a green-yellow-red traffic-light system to establish a dynamic gastrointestinal function assessment pathway; and expanding the prevention and management of postoperative nausea and vomiting, abdominal distension, and diarrhea into standardized procedures [17].

In the second round, expert opinions became more consistent. No items were added or deleted, and only minor wording revisions were suggested. Seven suggestions were adopted, involving the subdivision of contraindications, the timing of screening education, exclusion of nighttime hours when specifying feeding frequency, reduction of traditional Chinese medicine acupoints, and adjustment of dietary fiber supplementation.

The final EOF intervention protocol for patients undergoing colorectal cancer surgery comprised 6 first-level items and 37 second-level items (**Table 2**).

Table 2. Evidence-informed early oral feeding intervention protocol for patients undergoing colorectal cancer surgery

Item	Content
1. Relative and absolute contraindications to early oral feeding	**1.1 Relative contraindications:** (1) anastomosis located within 5 cm of the anal verge; (2) anastomotic ischemia; (3) ASA physical status III–V; (4) emergency surgery; (5) operative duration ≥4 h; (6) hand-sewn ileocolonic anastomosis. Specific decisions should be made according to the physician's recommendations.
	1.2 Absolute contraindications: (1) inability to take food orally for any reason; (2) I-FEED score ≥6; (3) severe systemic infection; (4) shock with inability to tolerate oral feeding; (5) complex gastrointestinal fistula; (6) intra-abdominal infection; (7) pelvic infection; (8) severe diarrhea; (9) major gastrointestinal bleeding; (10) intestinal obstruction; (11) intestinal wall edema; (12) frailty.
2. Nutritional risk screening and assessment of malnutrition	**2.1** (1) A nutritional support team comprising, at a minimum, physicians, dietitians, and nurses should be established according to the local clinical setting and available resources. Where feasible, the team should also include nutrition specialist nurses, pharmacists, and rehabilitation physicians. (2) From the time of admission and diagnosis of cancer, the nutritional support team should provide a standardized nutritional care pathway comprising screening, assessment, diagnosis, intervention, and monitoring, thereby establishing a continuous model of nutritional care.
	2.2 Nutritional risk screening: (1) **Screening tool:** Nutritional Risk Screening 2002 (NRS 2002). (2) **Timing:** at admission, on postoperative day 1, and at discharge; the assessment should be completed by a nurse within 24 h. (3) **Dynamic monitoring:** patients with a score <3 should be reassessed weekly; patients with a score ≥3 should be placed under nutritional risk alert and further assessed by a nutrition specialist nurse or dietitian.
	2.3 Nutritional assessment: Assessment should include dietary assessment, anthropometric measurements, laboratory testing, and nutritional status assessment using the Patient-Generated Subjective Global Assessment (PG-SGA). Malnutrition should be diagnosed and its severity graded according to the Global Leadership Initiative on Malnutrition (GLIM) criteria.
	2.4 Dietary assessment: A 24-h dietary recall should be used to assess energy and protein intake and identify deficiencies in dietary composition.
	2.5 Anthropometric assessment: Anthropometric measurements should be performed according to the assessment schedule. Common measurements include height, body weight, circumferences (e.g., mid-upper arm, thigh, calf, waist, and hip circumferences), and skinfold thickness (e.g., triceps, biceps, subscapular, abdominal, and suprailiac skinfolds). Among these parameters, body weight and calf circumference are considered the most sensitive and may therefore be prioritized in clinical practice. Measurements should be repeated weekly.
	2.6 Body composition analysis: A dietitian or nutrition specialist nurse should select an appropriate instrument for body composition assessment according to available clinical resources. For postoperative patients, body composition assessment may be omitted when the necessary equipment is unavailable or implementation is impractical.

Item	Content
2. Nutritional risk screening and assessment of malnutrition	**2.7 Laboratory testing:** (1) **Required tests:** complete blood count (lymphocyte count and hemoglobin) and blood biochemistry (albumin, prealbumin, and electrolytes), repeated weekly. (2) C-reactive protein should be reassessed every 2–3 days until the patient's condition stabilizes. (3) Trace element testing should be performed when clinically indicated.
	2.8 Diagnosis of malnutrition: A dietitian should diagnose malnutrition and determine its severity using the GLIM criteria.
	2.9 For patients at risk of malnutrition, the nutrition specialist nurse or dietitian should communicate with the attending physician within 24 h after nutritional assessment to assist with diagnosis and jointly develop an individualized nutritional intervention and nutritional nursing plan.
3. Principles of nutritional therapy	**3.1** Patients undergoing colorectal cancer surgery without contraindications may initiate early oral feeding within 24 h after surgery.
	3.2 (1) In the absence of additional fluid losses, patients should be encouraged to meet their fluid requirements primarily through oral water intake after surgery. (2) When oral intake is insufficient to meet fluid requirements, supportive intravenous fluid administration (e.g., glucose-containing solutions) should be provided as prescribed to maintain normal acid–base balance, electrolyte levels, and fluid volume status. The postoperative maintenance fluid requirement for adults is 30 mL/kg/day.
	3.3 Nutritional therapy should be initiated immediately, with oral nutritional supplementation (ONS) as the preferred option, in patients whose expected postoperative oral intake is low and who are unable to maintain >50% of the recommended intake for more than 7 days.
	3.4 When oral intake alone or oral intake combined with ONS fails to meet 60% of the patient's energy requirements for 3–5 days, enteral nutrition (EN) may be initiated. If EN is contraindicated or the patient explicitly refuses it, parenteral nutrition (PN) may be added as supplemental support.
	3.5 When tube feeding fails to meet 60% of the patient's energy requirements for 3–5 days, PN is recommended as an adjunct.
	3.6 Patients who develop severe complications, such as gastrointestinal dysfunction with an I-FEED score ≥6, severe systemic infection, shock with inability to tolerate oral feeding, complex gastrointestinal fistula, intra-abdominal infection, pelvic infection, major gastrointestinal bleeding, intestinal obstruction, intestinal wall edema, or frailty should not receive oral feeding, and PN should be initiated as early as possible.
	3.7 When the current level of nutritional therapy is sufficient to meet 50% of the target nutritional requirements, the treatment should be stepped down promptly to a nutritional approach that is more consistent with the patient's physiological status.
4. Energy and protein management	**4.1** For patients with colorectal cancer, energy requirements should preferably be determined by indirect calorimetry. When indirect calorimetry is unavailable, 104.5–125.4 kJ/kg/day (25–30 kcal/kg/day) may be used as the target range. In the early postoperative period, an initial energy target of 25 kcal/kg/day should be used.
	4.2 The recommended postoperative protein intake for patients with colorectal cancer is 1.2–1.5 g/kg/day. For patients experiencing a severe stress response, postoperative protein intake should be increased to 1.5–2.0 g/kg/day.
	4.3 Determination of target body weight: A simple formula may be used: ideal body weight = height (cm) − 105. The appropriate body weight for calculating total requirements should then be determined according to BMI. (1) For patients with normal weight (18.5 kg/m² ≤ BMI <24.0 kg/m²) or overweight (24.0 kg/m² ≤ BMI <28.0 kg/m²), actual body weight should be used to calculate target requirements. (2) For patients who are underweight (BMI <18.5 kg/m²), actual body weight should be used during the early postoperative period; once the patient's condition has stabilized, ideal body weight should be used to determine target requirements. (3) For patients with obesity (BMI ≥28.0 kg/m²), adjusted body weight should be used: adjusted body weight = ideal body weight + 0.4 × (actual body weight − ideal body weight).
5. Feeding protocol	**5.1** On the day before surgery, members of the nutritional support team should provide patients and their family members with nutritional education to promote appropriate understanding of nutritional management. Education should cover the importance of nutrition, postoperative dietary progression, and the role and use of ONS.

Item	Content
5. Feeding protocol	**5.2** On the day of surgery, nurses who have received standardized training should provide patients with a dietary diary and instruct them to follow the prescribed feeding plan as closely as possible and accurately record the actual daily feeding time, amount and type of food consumed, gastrointestinal tolerance, time of first bowel movement, and reasons for failing to achieve the target intake.
	5.3 On the day of surgery, after recovery from anesthesia, patients without coughing, nausea, vomiting, abdominal distension, or dizziness should be instructed by a nurse, according to medical orders, to first drink 20 mL of water. If no adverse reactions occur, water or ONS may subsequently be administered every 3 h at 30–50 mL per intake, according to tolerance. ONS should initially be provided at a low concentration equivalent to one-third to one-half of the standard concentration.
	5.4 Nutritional risk should be reassessed on postoperative day 1. Based on the reassessment results, the nutritional support team, patient, and family should collaboratively develop an individualized nutritional treatment plan that promotes active patient participation through effective communication.
	5.5 Postoperative day 1: (1) **Energy target:** 40% of the initial energy target. (2) **Diet:** clear liquid diet + ONS. (3) **Frequency and volume:** one feeding every 2–3 h, according to tolerance, excluding nighttime sleep; 50–100 mL per feeding. (4) **Feeding method:** feeding should progress from thinner to thicker consistencies and from smaller to larger amounts in a gradual manner. Patients should take small sips and consume small amounts frequently. ONS may be administered between meals.
	5.6 Postoperative day 2: (1) **Energy target:** 50% of the initial energy target. (2) **Diet:** thick liquid diet that is easy to digest + ONS. (3) **Frequency and volume:** one feeding every 2–3 h according to tolerance, 100–150 mL per feeding; for patients with good tolerance, the amount per meal may be increased by approximately 20%.
	5.7 Postoperative day 3: (1) **Energy target:** 60% of the initial energy target. (2) **Diet:** semi-liquid diet, which may include a small amount of soluble dietary fiber + ONS. (3) **Frequency and volume:** the amount of semi-liquid food should initially be approximately one-third to one-half of the patient's usual meal volume. ONS should be provided at 200–250 mL per serving according to tolerance, using a "3+3" regimen consisting of three regular meals and three ONS administrations per day.
	5.8 Postoperative day 4: (1) **Energy target:** 70% of the initial energy target. (2) **Diet:** semi-liquid diet with a greater variety of foods + ONS. (3) **Frequency and volume:** the amount of food should be gradually adjusted according to tolerance.
	5.9 Postoperative day 5: (1) **Energy target:** 80%–100% of the initial energy target. Diet: soft foods should be introduced, with appropriate amounts of low-fiber vegetables and fruits + ONS. (2) Frequency and volume: the diet should be gradually advanced toward a regular diet. At discharge, patients should be instructed to continue ONS, with a daily intake of 400–600 kcal until malnutrition or nutritional risk has resolved, after which ONS may be discontinued.
	5.10 Dietary consistencies: Clear liquid, liquid, semi-liquid, and soft diets should be advanced progressively according to tolerance.
	5.11 Outcome evaluation: Nurses who have received standardized training should review the patient's dietary diary daily to: (1) assess gastrointestinal intolerance after feeding, including abdominal pain, abdominal distension, diarrhea, nausea, and vomiting; (2) assess passage of flatus and stool; (3) assess dietary intake, including appetite, amount, and types of food consumed; (4) monitor changes in body weight; (5) observe the patient's clinical condition and closely monitor for complications; and (6) encourage patients to follow the feeding protocol as tolerated and maintain accurate records, with any abnormalities promptly reported to the nutritional support team.
	5.12 The nutritional support team should promptly adjust the patient's dietary plan according to postoperative recovery, nutritional assessment results, nutritional targets, individual preferences, dietary habits, and actual dietary intake.

Item	Content
6. Assessment and management of postoperative feeding tolerance	**6.1** The medical and nursing team should collaboratively advance the feeding protocol according to the I-FEED score. The three I-FEED categories—adequate gastrointestinal function, postoperative gastrointestinal intolerance (POGI), and postoperative gastrointestinal dysfunction (POGD)—should be represented by green-yellow-red light, respectively.(1) I-FEED score ≤2: adequate gastrointestinal function. The green-light pathway should be activated, and the feeding protocol should be continued while actively preventing postoperative nausea and vomiting. (2) **I-FEED score 3–5:** postoperative gastrointestinal intolerance (POGI), characterized by mild nausea, a small amount of non-bilious vomiting (≤100 mL), and abdominal distension. The yellow-light pathway should be activated, gastrointestinal intolerance should be monitored, and a liquid diet and antiemetic therapy may be considered. (3) **I-FEED score ≥6:** postoperative gastrointestinal dysfunction (POGD). The red-light pathway should be activated, oral feeding should be suspended, and a nasogastric tube should generally be placed to relieve symptoms and reduce the risk of aspiration, with PN initiated. **6.2 Prevention and management of postoperative nausea and vomiting:** (1) When persistent nausea and vomiting occur after the patient leaves the post-anesthesia care unit, bedside assessment should be performed first. After medication-related and mechanical causes have been excluded, antiemetic treatment may be initiated as prescribed. (2) For patients who have not received prophylactic medication, a low dose of a 5-HT3 receptor antagonist should be administered as prescribed when postoperative nausea and vomiting first occur. (3) In patients who received prophylaxis, an antiemetic from a different drug class should be used. After triple prophylaxis (5-HT3 receptor antagonist, dexamethasone, and droperidol or haloperidol), the same agents should not be repeated within 6 h; an alternative antiemetic should be used. After 6 h, a 5-HT3 receptor antagonist and droperidol or haloperidol may be repeated at the previous doses, whereas dexamethasone should not be repeated.(4) **Chewing gum:** postoperative gum chewing may be used to prevent postoperative nausea and vomiting . (5) Traditional Chinese medicine-based interventions may be used before and after surgery to prevent and manage postoperative nausea and vomiting: (a) electroacupuncture, transcutaneous electrical acupoint stimulation (TEAS), and conventional acupuncture, with recommended acupoints including Hegu (LI4), Neiguan (PC6), Zusanli (ST36), and Sanyinjiao (SP6); (b) bilateral Neiguan (PC6) acupressure; and (c) auricular point pressing, with recommended points including sympathetic, Shenmen, stomach, and spleen points. **6.3 Prevention and management of postoperative abdominal distension:** (1) Potential causes of abdominal distension should be investigated promptly using appropriate diagnostic methods, including anastomotic leakage, intra-abdominal infection, postoperative intestinal obstruction, and surgical-site infection. (2) Postoperative gum chewing (three times daily, 30 min per session until passage of flatus) may promote recovery of gastrointestinal function. (3) Once awake after surgery, patients should be positioned in a semi-recumbent position or encouraged to engage in appropriate in-bed activity. Ambulation should begin on postoperative day 1, with daily activity goals established and activity progressively increased. The “three-step” mobilization procedure should be used for getting out of bed: (a) sit up in bed for 30 s; (b) sit at the bedside with the legs hanging down for 30 s; and (c) stand beside the bed for 30 s. Patients should ambulate only in the absence of discomfort.(4) Electrolyte disturbances should be corrected, with particular attention to postoperative hypokalemia and hypomagnesemia and timely supplementation when necessary. (5) Traditional Chinese medicine interventions, such as foot massage combined with acupoint stimulation (e.g., Zusanli [ST36], Liangqiu [ST34], and Hegu [LI4]), may promote recovery of postoperative intestinal motility and help prevent abdominal distension. **6.4 Prevention and management of postoperative diarrhea:** (1) The Hart diarrhea scoring system should be used to assess postoperative diarrhea. (2) When diarrhea occurs during feeding, disease-related and non-nutritional medication-related causes should first be excluded rather than discontinuing feeding immediately. (3) Inappropriate use of antimicrobial agents should be minimized. (4) Hypoalbuminemia should be corrected promptly, and the use of acid-suppressive medications and oral potassium preparations should be minimized. (5) Foods and medications containing sorbitol should be avoided during episodes of diarrhea. (6) For patients who develop diarrhea associated with oral enteral nutritional preparations, soluble or mixed dietary fiber-containing enteral formulas may be added as prescribed to alleviate diarrhea. The original composition of the product should be considered to avoid excessive fiber intake and subsequent osmotic diarrhea; the total dietary fiber content is generally 20–30 g/L. (7) As prescribed, a whole-protein enteral formula may be replaced with a low-osmolarity or isotonic peptide-based enteral formula combined with probiotic therapy.

4. Discussion

4.1. Practical significance of developing an early oral feeding protocol for patients undergoing colorectal cancer surgery

Although evidence supporting EOF is well established, a gap remains between evidence and standardized clinical practice [4,6,18,19]. The protocol addresses this gap through stratified decision-making, standardized care processes, and feeding-tolerance management. Relative and absolute contraindications were distinguished to support individualized decisions, while NRS 2002, PG-SGA, GLIM, and I-FEED were incorporated into the standardized care pathway. The I-FEED-based traffic-light pathway and standardized management of common feeding intolerance symptoms are broadly consistent with the 2024 European guideline [20]. Low-cost adjunctive measures, including chewing gum and traditional Chinese medicine-based interventions, were also incorporated to support EOF implementation.

4.2. Scientific rigor of the early oral feeding protocol

The protocol was developed within the Joanna Briggs Institute (JBI) evidence-based healthcare framework using the FAME criteria. Expert authority coefficients (Cr) were ≥ 0.94 in both rounds, while Kendall's W increased from 0.114 ($p = 0.002$) to 0.218 ($p < 0.001$), indicating increased agreement after revision. In the second round, most second-level items had mean importance scores ≥ 4.80. The two lowest-rated items had means of 3.73 and 3.87, respectively, but both had CVs < 0.25 and were retained with flexible implementation provisions.

One expert suggested replacing EN with PN because patients are commonly discharged 4–7 days after surgery and nasogastric tubes are not routinely retained. However, EN remained the preferred option, with PN used when EN was infeasible or declined, preserving the principle of prioritizing enteral nutrition while allowing individualized decisions.

4.3. Potential for clinical translation of the early oral feeding protocol

The protocol integrates scientific rigor with operational feasibility through structured task decomposition, multidisciplinary collaboration, and patient participation. Postoperative nutritional management was organized into six functional modules: screening, assessment, diagnosis, intervention, monitoring, and feeding-tolerance management, thereby transforming complex decision-making into actionable procedures [21]. Multidisciplinary roles were also defined, with nurses responsible for nutritional screening, dietitians for nutritional diagnosis, and the multidisciplinary team for individualized nutritional planning [22,23]. Patients participate through preoperative education, dietary diary recording, and ongoing communication [24].

The protocol remains at the theoretical development stage, and its clinical feasibility, safety, and effectiveness require prospective evaluation.

5. Conclusion

In conclusion, the evidence-informed EOF intervention protocol developed for patients undergoing colorectal cancer surgery demonstrates practical significance, scientific rigor, and feasibility, and may provide a practical reference for the implementation of EOF in clinical practice. Future studies should implement the protocol in clinical settings to evaluate its feasibility and effectiveness and further refine the protocol based on empirical evidence.

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