**INTRODUCTION**

Bowel complications are a common occurrence after surgical interventions, such as gastrointestinal (GI) surgery. Advancements in GI surgery have directed attention toward optimizing recovery, including through the use of feeding methods that reduce prolonged postoperative hospital stays, complications, and mortality, among other undesirable outcomes. This study's primary goals were to identify current peer-reviewed literature reporting the postoperative outcomes of elective bowel surgery and to evaluate the clinical evidence of patients' tolerance to oral feeding following elective bowel surgery.

**Methods:** An exhaustive literature search was conducted via PubMed and Scopus. The search results were screened for potential articles, and articles were assessed for eligibility based on prespecified eligibility criteria. The data were synthesized, and the results were reported and discussed thematically.

**Results:** The database search yielded 1,667 articles, from which 18 randomized controlled trials were chosen for inclusion in this study. This study included 874 early oral feeding (EOF) patients, 865 traditional oral feeding patients, and 91 patients whose postoperative care was unspecified. Data synthesis was done, and meta-analyses were conducted. The results showed that EOF patients required a significantly shorter time to tolerate a solid diet and had shorter hospital stays. In addition, bowel function was restored earlier in EOF groups.

**Conclusion:** The results show good tolerance to EOF, shorter hospitalizations, and faster restoration of bowel function, suggesting that EOF after elective bowel surgery is relatively safe. However, further studies with similar baseline conditions should be conducted to verify these results.

**Keywords:** Intestines; Midline incision; Colorectal surgery; Diet enteral feeding
length of hospitalization, and reduce postoperative morbidity and mortality [2]. In addition, the resumption of oral nutrition immediately after GI surgery is also included as a care element in the Enhanced Recovery After Surgery (ERAS) protocol [3].

Despite the growing scientific consensus and patient preference for early oral feeding (EOF) after GI surgery, it is common practice to resume oral intake of fluids or solid meals only after the return of bowel function [4–6]. It has been reported that only a third of patients may tolerate solid meals by the 2nd postoperative day (POD), and half of the patients by POD 4 [7]. However, the results are inconclusive regarding the safety and efficacy of EOF. Therefore, there is a disconnect between practice guidelines and the standard practice of traditional care after elective GI surgery.

EOF involves the administration of an oral diet on the 1st postoperative day. Signs of intolerance to EOF include loss of appetite, nausea, and vomiting [8], and are discussed in this paper. Other postoperative outcomes, including complications, the length of hospitalization, restoration of bowel function, and adverse events like death, are also discussed in this study. Therefore, the primary aim of this study was to appraise the evidence of the tolerance of EOF, and the effects associated with it among patients who have undergone bowel surgery.

METHODS

The reporting of this study adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines [9].

Identification and selection of studies

Search strategy

A comprehensive search was done to identify peer-reviewed scholarly articles that reported on tolerance to EOF and other postoperative outcomes following elective bowel surgery. The PubMed and Scopus databases were searched using the following search terms in different combinations: postoperative, rectum, anus, colon, intestine, bowel, surgery, colostomy, resection, abdominal, or colon, clear fluid, oral feed, feeding, solid feeding, eat, and eating. A manual search was conducted on other references sourced from previous reviews and meta-analyses.

Eligibility criteria

This study included research articles on tolerance to EOF and other postoperative outcomes following elective bowel surgery. Articles were included with the following criteria: studies with online access to the full text; randomized controlled trials that specified the type of postoperative feeding for patients; studies reported in the English language or that could be translated into the English language; studies on adult patients; and studies whose participants underwent bowel surgery to manage underlying bowel conditions following diagnosis. The following articles were excluded: reviews, meta-analyses, opinion pieces, letters, and study protocols; studies on patients who underwent emergency bowel surgery, palliative bowel surgery, or patients who required prolonged postoperative enteral nutrition; studies without methods or results; studies with only abstracts; and cohort studies and case series.

Data selection and extraction

A reviewer made the study selection. Articles were screened by title and abstract, after which retrieval and full-text screening were conducted. The original inclusion and exclusion criteria were adjusted during the screening to enhance the results’ interpretability and the outcomes’ clinical significance. Studies on patients who underwent emergency bowel surgery, palliative bowel surgery, or patients who required prolonged postoperative enteral nutrition were excluded. Additionally, only randomized controlled trials were included to elevate the study to level 1 of evidence. Cohort studies and case series were excluded. Data from the included studies were systematically extracted and double-checked for consistency (as presented in Table 1 [10–27]) and included the following: author, study design, EOF sample size, mean age of EOF patients, TOF sample size, mean age of TOF patients, the surgical technique employed, the purpose of the study, outcome measure, and findings.

Methodological quality assessment

To assess the methodological quality of the randomized controlled trials included in this study, the Cochrane Risk of Bias tool (Cochrane Collaboration) was used [28]. A traffic light plot is presented in Fig. 1 [10–27], and a summary plot is in Fig. 2.

Statistical analysis

Study characteristics are presented in Table 1 [10–27]. The outcomes were thematically analyzed into tolerance to oral diet, hospitalization length, bowel function restoration, adverse outcomes, and postoperative complications. MetaXL was used to calculate the prevalence/percent occurrence of complication events. The use of the standardized mean difference (SMD) in this type of meta-analysis was considered the best option. Meta-analysis was carried out in Cochrane Review Manager (RevMan ver. 5.4.1, Cochrane Collaboration) using inverse-variance (mean and standard deviation values), a random-effects model and a 95% confidence interval.
<table>
<thead>
<tr>
<th>Study</th>
<th>Study design</th>
<th>Sample size</th>
<th>Sample size</th>
<th>Surgical technique</th>
<th>Study purpose</th>
<th>Outcome measure</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behrns et al.</td>
<td>RCT</td>
<td>27</td>
<td>17</td>
<td>Elective intestinal surgery</td>
<td>To determine the safety and length of hospital stay due to early initiation and discharge on a clear liquid diet</td>
<td>Postoperative intestinal-related sequelae, complications, and readmission rate</td>
<td>Early initiation and discharge on a clear liquid diet following elective intestinal surgery decreased the length of hospital stay and were safe</td>
</tr>
<tr>
<td>Binderow et al.</td>
<td>Prospective randomized study</td>
<td>32</td>
<td>32</td>
<td>Colon or small bowel resection</td>
<td>To evaluate whether early postoperative feeding is possible after laparotomy and colorectal resection</td>
<td>Rate of nasogastric tube reinsertion, duration of postoperative ileus, and length of hospitalization</td>
<td>Early oral intake was possible after laparotomy and colorectal resection</td>
</tr>
<tr>
<td>Lobato Dias Consoli et al.</td>
<td>RCT</td>
<td>15</td>
<td>14</td>
<td>Colorectal resection</td>
<td>To evaluate the impact of early postoperative oral feeding in patients undergoing elective colorectal resection</td>
<td>Hospital stay, complication rates, and acceptance of diet</td>
<td>Early oral intake was well tolerated, leading to significantly shorter hospital stays, and did not increase complications</td>
</tr>
<tr>
<td>da Fonseca et al.</td>
<td>Prospective randomized study</td>
<td>24</td>
<td>26</td>
<td>Elective colonic surgery</td>
<td>To assess the safety and the benefit of a simplified, well-defined perioperative rehabilitation program for elective colonic surgery, mainly focused on early oral nutrition</td>
<td>Diet tolerance</td>
<td>Early oral nutrition associated with a simplified perioperative rehabilitation program reduced the postoperative length of hospital stay and ileus time after elective colonic resection, without increasing rates of complications or readmissions</td>
</tr>
<tr>
<td>Dag et al.</td>
<td>Prospective randomized clinical study</td>
<td>99</td>
<td>100</td>
<td>Colorectal surgery</td>
<td>To evaluate the safety and tolerability of EOF after colorectal operations</td>
<td>Bowel movements, defecation, and time of tolerance of solid diet</td>
<td>Early postoperative feeding was safe and led to the early recovery of gastrointestinal functions</td>
</tr>
<tr>
<td>El Nakeeb et al.</td>
<td>RCT</td>
<td>60</td>
<td>60</td>
<td>Colonic anastomosis</td>
<td>To assess the safety outcome of EOF and reports on the factors affecting early postoperative feeding after colorectal procedures</td>
<td>Time to first passage of flatus and stool, hospital stay</td>
<td>EOF after colorectal surgery was safe and tolerated by most patients</td>
</tr>
<tr>
<td>Feo et al.</td>
<td>RCT</td>
<td>50</td>
<td>50</td>
<td>Colorectal resection</td>
<td>The effect of EOF without nasogastric decompression following elective colorectal resection for cancer</td>
<td>Resumption of intestinal function and length of hospital stay</td>
<td>Patients undergoing elective colorectal resection could be managed without postoperative nasogastric catheters, starting oral feeding on the 1st postoperative day</td>
</tr>
<tr>
<td>Hartsell et al.</td>
<td>RCT</td>
<td>29</td>
<td>29</td>
<td>Colorectal surgery</td>
<td>To investigate whether successful early feeding would lead to a shorter duration of hospitalization and, therefore, would be more cost-effective</td>
<td>Rates of nausea and length of hospital stay</td>
<td>EOF after elective colorectal surgery was safe</td>
</tr>
<tr>
<td>Lucha et al.</td>
<td>RCT</td>
<td>51</td>
<td>51</td>
<td>Colorectal resection</td>
<td>To investigate hospitalization, hospital costs, morbidity, and time to diet tolerance</td>
<td>Length of hospital stay, hospital costs, morbidity, and time to tolerance of a diet</td>
<td>Early postoperative enteral support did not reduce hospital stay, nursing workload, or costs</td>
</tr>
</tbody>
</table>

(Continued on the next page)
<table>
<thead>
<tr>
<th>Study</th>
<th>Study design</th>
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<th>EOF</th>
<th>TOF</th>
<th>Surgical technique</th>
<th>Study purpose</th>
<th>Outcome measure</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minig et al. [19] (2009)</td>
<td>RCT</td>
<td>18</td>
<td>54</td>
<td>22</td>
<td>58</td>
<td>Intestinal resection</td>
<td>Hospital stay</td>
<td>Early resumption of oral intake was feasible and safe in gynecologic oncology</td>
</tr>
<tr>
<td>Nematihonar et al. [20] (2019)</td>
<td>RCT</td>
<td>54</td>
<td>64.1 ± 13.9</td>
<td>54</td>
<td>50.58 ± 18.2</td>
<td>Small intestine anastomosis</td>
<td>EOF shortened the time of the first passage of stool and reduced the length of hospital stay</td>
<td></td>
</tr>
<tr>
<td>Ortiz et al. [21] (1996)</td>
<td>RCT</td>
<td>95</td>
<td>65.54</td>
<td>95</td>
<td>65.70</td>
<td>Elective colorectal or rectal operation</td>
<td>Tolerance to oral intake, bowel movement</td>
<td>EOF was feasible and safe for patients with elective colorectal surgery</td>
</tr>
<tr>
<td>Pragatheeswarane et al. [23] (2016)</td>
<td>Prospective RCT</td>
<td>60</td>
<td>46.5 ± 17.2</td>
<td>60</td>
<td>46.9 ± 16.5</td>
<td>Elective open bowel surgery</td>
<td>Time to first flatus and defecation, time to start solid eating</td>
<td>Early postoperative feeding was safe, was well tolerated, and reduced the length of hospitalization</td>
</tr>
<tr>
<td>Reissman et al. [24] (1995)</td>
<td>RCT</td>
<td>80</td>
<td>51</td>
<td>81</td>
<td>56</td>
<td>Colon or small bowel resection</td>
<td>Length of hospitalization, nasogastric tube reinsertion, and rate of vomiting</td>
<td>EOF after elective colorectal surgery was safe and could be tolerated by most patients</td>
</tr>
<tr>
<td>Nematihonar et al. [25] (2018)</td>
<td>RCT</td>
<td>30</td>
<td>45.8 ± 17.1</td>
<td>30</td>
<td>46.8 ± 13.6</td>
<td>Colorectal anastomosis</td>
<td>Times to the first passage of flatus and stool</td>
<td>EOF after colorectal surgery was safe and tolerated by most patients</td>
</tr>
<tr>
<td>Stewart et al. [26] (1998)</td>
<td>Prospective</td>
<td>40</td>
<td>58</td>
<td>40</td>
<td>59</td>
<td>Colorectal surgery</td>
<td>Time to tolerate a diet</td>
<td>Early feeding was successfully tolerated leading to earlier resolution of ileus and less hospitalization</td>
</tr>
<tr>
<td>Zhou et al. [27] (2006)</td>
<td>RCT</td>
<td>161</td>
<td>55.3 ± 16.7</td>
<td>155</td>
<td>57.1 ± 19.8</td>
<td>Colorectostomy</td>
<td>Time to the passage of stool, length of postoperative stay, and acute dilation of the stomach</td>
<td>Application of gastrointestinal decompression after colorectostomy could not effectively reduce postoperative complications</td>
</tr>
</tbody>
</table>

EOF, early oral feeding; TOF, traditional oral feeding; RCT, randomized controlled trial.

*Mean ± standard deviation. Laparoscopy-assisted. Laparoscopy.
interval (CI). Heterogeneity between studies was tested using the I² statistic. A P-value of 0.05 was adopted as the significance threshold.

RESULTS

Study selection
The literature search yielded 1,667 articles, from which 71 duplicates were removed. Further, 809 articles were removed before the screening, and 537 were excluded following title and abstract screening. The remaining 321 articles were sought for retrieval, after which 18 randomized controlled trials that met the eligibility criteria were included. The results are presented in Fig. 3.

Risk of bias in the included studies
In the risk of bias assessment of the 18 included studies [10–27], we found that all of them exhibited a low risk of bias in various key domains, including randomization, deviations from intended intervention, missing outcome data, and outcome measurement. Specifically, none of the studies showed significant bias in these domains. However, in the domain of bias in the selection of reported results, only 2 studies [11, 12] raised “some concerns.” Therefore, the overall risk of bias for the 18 studies was predominantly low, with 16 studies [10, 13–27] demonstrating low risk and only 2 studies [11, 12] having some concerns in the selection of reported results (Figs. 1, 2).

Thematic analysis of the included studies
The study characteristics are presented in Table 1 [10–27]. In this section, significant themes are reviewed, including tolerance to the patient’s oral diet, hospitalization length, bowel function restoration, adverse outcomes, and postoperative complications [29].

Tolerance to oral diet
A significantly shorter time was required to start a solid diet among EOF patients than among TOF patients, with an SMD of −1.35 (95% CI, −1.88 to −0.81; P < 0.001), as shown in Fig. 4 [14, 23].

Length of hospitalization
Hospital stays, defined in terms of the number of days spent in the hospital postoperatively, were significantly shorter in the EOF group than in the TOF group. EOF patients also spent substantially fewer postoperative days in the hospital, as shown in Fig. 5 [13–

Fig. 1. Traffic light plot of risk of bias assessment of the included studies.

Fig. 2. Summary plot of the risk of bias assessment of the randomized controlled trials.

https://doi.org/10.3393/ac.2023.00472.0067
The SMD of the number of days in the hospital for bowel surgery patients was \(-0.92\) (95% CI, –2.57 to –0.34; \(P < 0.001\)). High heterogeneity was observed \(I^2 = 97\%\) (Fig. 5B) [11, 15, 17, 24].

**Mortality rate**

The pooled mortality rate among those who received surgery was 2.66\% (95% CI, 1.05\% to 4.92\%), with a Cochran Q value of 1.185 and a \(P\)-value of 0.88 (Fig. 6) [13, 17, 19, 23, 26].

**Anastomotic leak**

The pooled prevalence for the occurrence of anastomotic leak was 3.34\% (95% CI, 1.96\% to 5.07\%). The Cochran Q value was 9.22 and the \(P\)-value was 0.25 (Fig. 7) [13, 14, 17, 19, 23, 25–27].

**Restoration of bowel function**

Bowel function was evaluated using different parameters, such as bowel movement, the passage of flatus, and stool. The EOF group showed a significantly shorter time to the passage of the first flatus (SMD, \(-1.01\); 95% CI, \(-1.52\) to \(-0.50\); \(P < 0.001\)), with a heterogeneity of 90\%, as shown in Fig. 8 [13, 15, 20, 23, 25, 27]. The EOF group showed a significantly shorter time to the passage of the first flatus, as shown in Fig. 9 [14, 15, 20, 23, 25, 27]. The SMD for the time to stool passage after bowel surgery was \(-1.01\) (95% CI, \(-1.51\) to \(-0.52\); \(P < 0.001\)), with a heterogeneity of
Fig. 5. Forest plots comparing the length of hospitalization between early oral feeding (EOF) and traditional oral feeding (TOF) groups among patients who underwent (A) bowel surgery and (B) colorectal surgery. SD, standard deviation; IV, inverse-variance; Random, random-effects model; CI, confidence interval.

<table>
<thead>
<tr>
<th>Study</th>
<th>EOF Mean</th>
<th>SD</th>
<th>Total</th>
<th>TOF Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Standardized mean difference IV, Random, 95% CI</th>
<th>Standardized mean difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>da Fonseca et al. [13] (2011)</td>
<td>4</td>
<td>3.7</td>
<td>24</td>
<td>7.6</td>
<td>8.1</td>
<td>26</td>
<td>19.5%</td>
<td>−0.56 [−1.12, 0.01]</td>
<td>−0.57 [−1.21, 0.06]</td>
</tr>
<tr>
<td>Minig et al. [19] (2009)</td>
<td>6.9</td>
<td>2.6</td>
<td>18</td>
<td>9.1</td>
<td>4.5</td>
<td>22</td>
<td>18.8%</td>
<td>−0.57 [−1.21, 0.06]</td>
<td>−0.67 [−1.04, 0.30]</td>
</tr>
<tr>
<td>Pragatheeswarane et al. [23] (2014)</td>
<td>9.5</td>
<td>3.6</td>
<td>60</td>
<td>11.8</td>
<td>3.2</td>
<td>60</td>
<td>21.4%</td>
<td>−0.57 [−1.21, 0.06]</td>
<td>−0.67 [−1.04, 0.30]</td>
</tr>
<tr>
<td>Nemathionar et al. [25] (2018)</td>
<td>4.06</td>
<td>0.64</td>
<td>30</td>
<td>6.1</td>
<td>0.84</td>
<td>30</td>
<td>17.9%</td>
<td>−2.78 [−3.50, −2.05]</td>
<td>−2.78 [−3.50, −2.05]</td>
</tr>
<tr>
<td>Zhou et al. [27] (2006)</td>
<td>8.4</td>
<td>3.4</td>
<td>161</td>
<td>9.6</td>
<td>5</td>
<td>155</td>
<td>22.4%</td>
<td>−2.78 [−3.50, −2.05]</td>
<td>−2.78 [−3.50, −2.05]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.92 [−1.56, −0.27]</td>
<td>−0.92 [−1.56, −0.27]</td>
</tr>
</tbody>
</table>

Heterogeneity: Tau²=0.47; Chi²=42.66, df=4 (P<0.001); I²=91%
Test for overall effect: Z=2.79 (P=0.005)

<table>
<thead>
<tr>
<th>Study</th>
<th>EOF Mean</th>
<th>SD</th>
<th>Total</th>
<th>TOF Mean</th>
<th>SD</th>
<th>Total</th>
<th>Weight</th>
<th>Standardized mean difference IV, Random, 95% CI</th>
<th>Standardized mean difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dag et al. [14] (2011)</td>
<td>5.55</td>
<td>2.35</td>
<td>99</td>
<td>9</td>
<td>6.5</td>
<td>100</td>
<td>25.5%</td>
<td>−0.70 [−0.99, −0.42]</td>
<td>−0.70 [−0.99, −0.42]</td>
</tr>
<tr>
<td>El Nakeeb et al. [15] (2009)</td>
<td>6.2</td>
<td>0.2</td>
<td>60</td>
<td>6.9</td>
<td>0.5</td>
<td>60</td>
<td>25.0%</td>
<td>−1.83 [−2.25, −1.40]</td>
<td>−1.83 [−2.25, −1.40]</td>
</tr>
<tr>
<td>Hartsell et al. [17] (1997)</td>
<td>7.2</td>
<td>3.3</td>
<td>29</td>
<td>8.1</td>
<td>2.3</td>
<td>29</td>
<td>24.6%</td>
<td>−0.31 [−0.83, 0.21]</td>
<td>−0.31 [−0.83, 0.21]</td>
</tr>
<tr>
<td>Reissman et al. [24] (1995)</td>
<td>6.2</td>
<td>0.2</td>
<td>80</td>
<td>6.8</td>
<td>0.2</td>
<td>81</td>
<td>24.9%</td>
<td>−2.99 [−3.44, −2.53]</td>
<td>−2.99 [−3.44, −2.53]</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−1.46 [−2.57, −0.34]</td>
<td>−1.46 [−2.57, −0.34]</td>
</tr>
</tbody>
</table>

Heterogeneity: Tau²=1.25; Chi²=89.92, df=3 (P<0.001); I²=97%
Test for overall effect: Z=2.55 (P=0.01)

Fig. 6. Mortality rates. CI, confidence interval.

86% (Fig. 9A) [20, 23, 25, 27]. The SMD for the time to stool passage after colorectal surgery was −0.84 (95% CI, −1.15 to −0.53; P<0.001), with a heterogeneity of 42% (Fig. 9B) [14, 15].

**DISCUSSION**

EOF has been considered an essential approach to enhancing and optimizing recovery and thereby restoring the quality of life among patients following elective bowel surgery [8]. Tolerance to EOF was reported by 12 of the studies examined in this study.

Tolerance was evaluated by the frequency of nausea, vomiting, and appetite loss [30]. Dietary intake was significantly different between the EOF and TOF groups. The oral diet was administered in various ways, including nil by mouth, clear liquids, all liquids, soft diet, and solid diet. Clear liquids were administered to the TOF group, whereas a solid diet was administered to the EOF group on the 1st postoperative day in this study.

The results suggest an excellent tolerance to EOF among EOF patients.
Fig. 7. Rates of anastomotic leak. CI, confidence interval.

Fig. 8. Forest plot comparing the early oral feeding (EOF) and traditional oral feeding (TOF) groups regarding the time to the first passage of flatus. SD, standard deviation; IV, inverse-variance; Random, random-effects model; CI, confidence interval.

Fig. 9. Forest plot comparing stool passage time between early oral feeding (EOF) and traditional oral feeding (TOF) groups among patients who underwent (A) bowel surgery and (B) colorectal surgery. SD, standard deviation; IV, inverse-variance; Random, random-effects model; CI, confidence interval.
patients, with comparable outcomes to those of TOF patients regarding vomiting and nausea. Dag et al. [14] reported that 85.9% of EOF patients tolerated the postoperative care schedule. Hartsell et al. [17] reported a 55% tolerance to the feeding schedule among EOF patients versus a 50% tolerance among TOF patients. Patients who did not tolerate EOF were reported to experience repeated vomiting and abdominal swelling [15].

A total of 48% of EOF patients reported vomiting, compared to 33% in the TOF group. Minig et al. [19] reported that 78% of EOF patients resumed solid oral intake on the 1st postoperative day. Instances of vomiting and nausea were comparable and did not show a statistically significant difference between the EOF and TOF patients [13, 20, 24]. The different postoperative care groups exhibit similar tolerance to early oral diets [22].

The surgical interventions used to manage bowel complications are associated with postoperative complications, like other standard surgical procedures [31]. Comparable adverse outcomes and postoperative complication rates were found in EOF and TOF patients. Common complications included anastomotic leaks, fever, and death. Complications directly impact other outcomes, such as the length of hospitalization and hospital readmission, among others [32]. However, the results were inconsistent, given the differences in the studies’ baseline conditions, including study design.

Prolonged hospital stays are often undesirable and associated with complications, such as muscle weakness and thromboembolic events [33]. In this study, the length of hospitalization was evaluated in terms of the number of days after surgery until discharge. Hospitalization was significantly shorter among EOF patients in most of the included studies. However, some studies reported similar postoperative lengths of stay in the hospital. As reported in this paper, variations might have arisen from the different study designs.

The quality of a patient’s recovery following elective bowel surgery is often assessed by the restoration of bowel function. This metric is evaluated by the early return of bowel function, including the passage of flatus and stool, in addition to bowel movements [20]. Most of the included studies reported that bowel function was restored in a shorter time (in terms of the time to the passage of the first flatus and stool) among EOF patients than among TOF patients. However, similar results were obtained regarding when the first bowel movement was noted.

In conclusion, the results of this study—good tolerance to EOF, shorter hospital stays, and faster restoration of bowel function—suggest that EOF after elective bowel surgery is relatively safe. However, some of the included studies reported inconsistent results due to differences in the study setting and study design. Therefore, further studies should be conducted with identical baseline conditions to verify the results of this study.

**ARTICLE INFORMATION**

**Conflict of interest**

No potential conflict of interest relevant to this article was reported.

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**Author contributions**

Conceptualization: all authors; Investigation: all authors; Methodology: all authors; Validation: all authors; Writing–original draft: all authors; Writing–review & editing: all authors. All authors read and approved the final manuscript.

**REFERENCES**


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