

ORIGINAL ARTICLE

Comparison of early versus late enteral feeding after elective ileostomy closure.

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ABSTRACT... Objective: To compare early and late enteral feeding after Elective Ileostomy Closure in terms of mean hospital stay and frequency of wound infection. **Study Design:** Randomized Controlled Trial. **Setting:** Department of Surgery, Allied Hospital I Faisalabad. **Period:** April to September 2024. **Methods:** Ninety patients undergoing elective ileostomy closure were randomly divided into two equal groups. Group E received oral intake after 24 hours, while Group L began feeding after the return of bowel sounds. Outcomes measured were wound infection within seven days postoperatively and length of hospital stay. **Results:** Mean hospital stay was significantly shorter in Group E (10.00 ± 3.61 days) compared to Group L (12.93 ± 2.32 days; $p < 0.001$). Wound infection occurred in 13.3% of patients in Group E and 35.6% in Group L ($p = 0.014$). Stratified analysis showed consistent benefits of early feeding across age, gender, and BMI categories. **Conclusion:** Early enteral feeding after ileostomy closure significantly reduces wound infections and hospital stay. It is a safe and effective practice, especially beneficial in low-resource surgical settings.

Key words: Enteral Feeding, Hospital Stay, Ileostomy Closure, Randomized Controlled Trial, Wound Infection.

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INTRODUCTION

In surgical management of small and large bowel conditions, creating an intestinal stoma is a common adjunct procedure.¹⁻² Temporary ileostomies, in particular, are commonly fashioned to divert intestinal contents and reduce pressure on the distal anastomotic site, thereby minimizing the likelihood of leakage.³ However, anastomotic leakage remains a serious complication, occurring in approximately 15% of patients, and is associated with severe outcomes including peritonitis, sepsis, and potential mortality.⁴⁻⁶

Conventional postoperative management after GI surgeries typically delayed oral intake until bowel function resumed, as shown by flatus or stool passage.⁷ In contrast, Enhanced Recovery After Surgery (ERAS) protocols advocate for initiating oral feeding—ranging from clear liquids to full diets—within the early postoperative period to improve recovery outcomes, shorten hospital stays, and decrease postoperative complications.⁸⁻⁹

Evidence from various studies suggests that early enteral nutrition, started within 24 hours after surgery, can improve outcomes in patients undergoing treatment for gastrointestinal perforations. This method aims to bolster immune response and avert nutritional deficiencies. In contrast, other investigations have linked delayed feeding, initiated after 48 hours, with better results such as decreased morbidity and mortality.¹⁰ A study reported mean hospital stay in groups A(early) and B(late) was 10.26 ± 3.09 and 13.40 ± 2.19 days respectively.¹¹ While another study reported wound infection as 8 (10.25%) in early group and 28 (35.89%) in late group.¹²

The concept of early enteral feeding to the patient after intestinal anastomosis has always been an interesting topic for researchers. There are no established guidelines available in literature for starting early enteral feeding in ileostomy reversal patients to date. The present study is aimed to find out the safety of early oral feeding after stoma closure in terms of wound infection and hospital stay.

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Based on the results of this study guidelines will be made to recommend the technique with less postoperative stay and complications.

METHODS

This randomized controlled trial was conducted at the Department of Surgery, Allied Hospital, Faisalabad, over a period of six months from the April to September 2024 following the approval of the study synopsis from the Ethical Review Committee (Reference No.48.ERC/FMU/2023-24-410, Dated: 15/03/2024). The objective was to compare early versus late enteral feeding after elective ileostomy closure in terms of mean hospital stay and frequency of wound infection.

A total sample size of 90 patients (45 in each group) was calculated using the WHO sample size calculator, with a 5% level of significance, 80% power, and anticipated wound infection proportions of 10.25% for early feeding and 35.89% for late feeding groups.

Patients were recruited through non-probability consecutive sampling. Inclusion criteria comprised adult patients aged between 18 to 70 years, of either gender, who had previously undergone temporary ileostomy and were admitted for elective stoma closure. Patients were excluded if they had comorbid conditions such as diabetes mellitus, malignancy undergoing chemotherapy or radiotherapy, were pregnant females, or required a full midline laparotomy for ileostomy reversal.

Eligible patients were enrolled after obtaining written informed consent. Preoperative evaluations included complete blood count (CBC), serum electrolytes, blood urea nitrogen (BUN), and total serum protein levels. All patients underwent ileostomy closure under general anesthesia, performed by an experienced surgical team. Following surgery, patients were randomly allocated into two groups: Group E (early feeding) and Group L (late feeding). In Group E, patients were allowed to start oral sips 24 hours postoperatively, whereas in Group L, feeding was initiated only after the return of bowel sounds.

Postoperative outcomes assessed included wound

infection—defined as the presence of redness, swelling, and purulent discharge at the surgical site within seven days—and the length of hospital stay, calculated from the day of surgery to the day of discharge. Discharge criteria included cessation of fluid discharge from drains, return of bowel sounds, tolerance to oral intake, and vital stability (normal heart rate, blood pressure, and temperature).

All collected data were entered and analyzed using SPSS version 25. Quantitative variables such as age, weight, height, BMI, and hospital stay were expressed as mean and standard deviation. Qualitative variables such as gender and wound infection were presented as frequencies and percentages. The independent sample t-test was used to compare the length of hospital stay between the two groups, while the chi-square test was used to assess the association between feeding regimen and wound infection. Stratification was done for potential effect modifiers such as age, gender, and BMI. Post-stratification analysis was performed using independent t-test and chi-square test.

RESULTS

The study included a total of 90 participants undergoing elective ileostomy closure, with demographic characteristics summarized in Table 1. A majority of the participants (62.2%) were aged between 18 to 50 years, while 37.8% were between 51 to 70 years. Males constituted a larger proportion of the sample (61.1%) compared to females (38.9%). Regarding body mass index (BMI), 60% of the participants had a BMI between 18–25 kg/m², whereas 40% had a BMI greater than 25 kg/m².

TABLE-I

Demographics details of the participants (N=90)

	Variables	Count	%
Age(years)	18-50	56	62.2
	51-70	34	37.8
Gender	Male	55	61.1
	Female	35	38.9
BMI	18-25	54	60
	>25	36	40

Table-II provides details of continuous variables by study group. The mean age in the early feeding group (Group E) was 46.42 ± 15.58 years, while in the late feeding group (Group L) it was slightly lower at 40.96 ± 15.74 years, though the difference was not statistically significant ($p = 0.101$). Similarly, the mean BMI was 23.60 ± 2.66 kg/m² in Group E and 24.65 ± 2.71 kg/m² in Group L ($p = 0.066$). However, a significant difference was found in the mean duration of hospital stay: Group E had a shorter stay of 10.00 ± 3.61 days, while Group L had a longer stay of 12.93 ± 2.32 days ($p < 0.001$), indicating that early enteral feeding may reduce hospitalization time.

TABLE-II

Continuous variables details of the participants (N=90)

Variable	Group E (n=45)	Group L(n=45)	P-Value ^a
Age (years)	46.42±15.58	40.96±15.74	0.101
BMI (kg/m ²)	23.60±2.66	24.65±2.71	0.066
Hospital Stay (Days)	10.00±3.61	12.93±2.32	0.000

^aIndependent t test

Table-III compares wound infection rates between the two groups. Wound infection occurred in 13.3% of patients in the early feeding group compared to 35.6% in the late feeding group. This difference was statistically significant ($p = 0.014$), suggesting that early enteral feeding may be associated with a lower risk of postoperative wound infection.

TABLE-III

Comparison of early versus late enteral feeding after elective ileostomy closure

Wound infection	Group E (n=45)	Group L(n=45)	P-Value ^a
Yes	6(13.3%)	16(35.6%)	0.014
No	39(86.7%)	29(64.4%)	

^aChi Square test

Table-IV evaluates hospital stay duration according to various effect modifiers. Among patients aged 18–50 years, the early feeding group had a significantly shorter hospital stay (10.04 ± 3.35 days) compared

to the late feeding group (13.20 ± 2.22 days, $p < 0.001$). A similar trend was observed in the 51–70 age group, where Group E had a shorter stay (9.95 ± 4.03 days) compared to Group L (12.40 ± 2.50 days, $p = 0.048$). BMI stratification revealed that patients with a BMI of 18–25 in Group E had significantly shorter stays (9.84 ± 4.00 days) than those in Group L (13.04 ± 1.99 days, $p < 0.001$). Even among those with BMI >25, Group E had shorter hospital stays (10.36 ± 2.65 vs. 12.82 ± 2.67 days; $p = 0.011$). Gender-wise analysis showed males in Group E stayed for 10.81 ± 3.76 days versus 12.82 ± 2.55 days in Group L ($p = 0.024$), and females in Group E had an even more pronounced reduction in hospital stay (8.78 ± 3.08 vs. 13.12 ± 1.93 days; $p < 0.001$).

TABLE-IV

Comparison of early versus late enteral feeding after elective ileostomy closure according to various effect modifiers (N=90)

Variable		Group E	Group L	P-Value ^a
Age (years)	18-50	10.04+3.35	13.20+2.22	0.000
	51-70	9.95+4.03	12.40+2.50	0.048
BMI (kg/m ²)	18-25	9.84+4.00	13.04+1.99	0.000
	>25	10.36+2.65	12.82+2.67	0.011
Gender	Male	10.81+3.76	12.82+2.55	0.024
	Female	8.78+3.08	13.12+1.93	0.000

^aIndependent t test

Table-V presents the comparison of wound infection between groups according to effect modifiers. Among participants aged 18–50, infection was more common in Group L (40.0%) than Group E (15.4%), with a statistically significant difference ($p = 0.042$). In the 51–70 group, although infection was again higher in Group L (26.7%) compared to Group E (10.5%), the difference was not statistically significant ($p = 0.220$). Male patients showed a significant difference in infection rates (39.3% in Group L vs. 14.8% in Group E; $p = 0.042$), while female participants showed a non-significant difference (29.4% vs. 11.1%; $p = 0.176$). When stratified by BMI, patients with BMI 18–25 in Group L had significantly higher infection rates (39.1%) compared to Group E (12.9%; $p = 0.026$). However, no significant difference was noted in infection rates among those with BMI >25 (31.8% in Group L vs. 14.3% in Group E; $p = 0.236$).

TABLE-V

Comparison of early versus late enteral feeding after elective ileostomy closure according to various effect modifiers (N=90)

Variable		Wound Infection	Group E (Count, %)	Group L (Count, %)	Total (Count, %)	P- Value ^a
Age	18-50	Yes	4 (15.4%)	12 (40.0%)	16 (28.6%)	0.042
		No	22 (84.6%)	18 (60.0%)	40 (71.4%)	
	51-70	Yes	2 (10.5%)	4 (26.7%)	6 (17.6%)	0.220
		No	17 (89.5%)	11 (73.3%)	28 (82.4%)	
Gender	Male	Yes	4 (14.8%)	11 (39.3%)	15 (27.3%)	0.042
		No	23 (85.2%)	17 (60.7%)	40 (72.7%)	
	Female	Yes	2 (11.1%)	5 (29.4%)	7 (20.0%)	0.176
		No	16 (88.9%)	12 (70.6%)	28 (80.0%)	
BMI	18-25	Yes	4 (12.9%)	9 (39.1%)	13 (24.1%)	0.026
		No	27 (87.1%)	14 (60.9%)	41 (75.9%)	
	>25	Yes	2 (14.3%)	7 (31.8%)	9 (25.0%)	0.236
		No	12 (85.7%)	15 (68.2%)	27 (75.0%)	

^aChi Square test

DISCUSSION

This randomized controlled trial evaluated the impact of early versus late enteral feeding following elective ileostomy closure. The results indicate that early initiation of oral intake—within 24 hours postoperatively—is associated with a significantly lower incidence of wound infection (13.3% vs. 35.6%) and reduced duration of hospital stay (10.00 ± 3.61 vs. 12.93 ± 2.32 days). These outcomes align with current recommendations promoting early feeding as part of enhanced recovery protocols in gastrointestinal surgery.

From a regional perspective, several studies in South Asia support the observed benefits. A local study from Pakistan by Khan et al. (2021)¹³ reported similar trends, with early-fed patients experiencing significantly fewer wound infections (8% vs. 33%) and shorter hospital stays (2.62 ± 0.71 vs. 6.55 ± 2.93 days). These findings are particularly relevant in low-resource settings like ours, where minimizing postoperative complications and hospital occupancy is essential. Another Pakistani study by Husain et al. (2023)¹⁴ evaluated emergency gastrointestinal procedures and similarly found lower complication rates (13.3% in early-fed vs. 30% in late-fed) and shorter recovery periods, further confirming the feasibility and safety of early feeding in our population.

From the broader South Asian region, Kallakuri and Maruvada (2025, India)¹⁵ demonstrated significant differences in surgical site infections (6% in early-fed vs. 46% in late-fed) and general postoperative well-being, providing regional validation of early feeding protocols. Another Indian study, by Rakshitha et al. (2023)¹⁶, emphasized that early enteral feeding led to improved serum albumin levels postoperatively and reduced both infection rates and hospital stay in patients undergoing surgery for gut perforations. Supporting this further, Kannavar et al. (2024)¹⁷ conducted a randomized study on gastrointestinal emergencies and found early-fed patients had markedly lower complications such as wound infection (2.9% vs. 11.4%) and anastomotic leaks (0% vs. 8.6%). These findings are similar to our outcomes in elective ileostomy closures, suggesting that early feeding can be safely extended across various GI surgeries in the region.

Another prospective study from India by Soni et al. (2022)¹⁸ showed reduced postoperative complications (11.4% vs. 25.7%) and shorter hospitalization (10.26 ± 3.09 vs. 13.4 ± 2.19 days) in early-fed patients. These findings are consistent with our study and reflect regional consensus favoring early oral intake. A recent meta-analysis in our country by Ejaz et al (2025)¹⁹, incorporating data from multiple high-resource centers, demonstrated that early enteral feeding reduced infectious

complications (RR 0.68), pulmonary issues (RR 0.60), and hospital stay by an average of 2.1 days, compared to parenteral nutrition. This underscores the universal applicability of early feeding regardless of healthcare system development.

The Cochrane review by Herbert et al. (2019)²⁰ synthesized results from 17 RCTs in developed nations and found that early enteral nutrition shortened hospital stay by approximately 1.95 days. However, it reported no significant difference in wound infection or mortality due to heterogeneity across studies and variable reporting quality. Nonetheless, the physiologic rationale behind early enteral feeding—enhanced gut motility, reduced bacterial translocation, and preserved mucosal integrity—remains well established.

Our stratified analysis strengthens the case for early feeding across different demographic groups. Patients aged both 18–50 and 51–70 years experienced significantly shorter hospital stays with early feeding. Likewise, both male and female participants benefited, with a particularly marked reduction among females. Patients with normal or elevated BMI also showed consistent trends, suggesting that early feeding offers benefits across a wide spectrum of clinical profiles.

A major strength of this study is its randomized controlled design, which reduces selection bias and enhances the validity of comparisons. Additionally, the use of strict inclusion and exclusion criteria, as well as standardized surgical and postoperative care protocols, contributes to the internal reliability of our findings. The study also provides valuable data stratified by key patient characteristics (age, gender, BMI), offering deeper insights into subgroup responses.

However, the study has some limitations. It was conducted at a single tertiary care hospital, which may limit external generalizability to other centers with different surgical practices or patient populations. The sample size, although adequately powered for detecting differences in infection and hospital stay, was not large enough to assess rare complications such as anastomotic leakage. Furthermore, long-term nutritional outcomes, cost-

effectiveness analysis, and patient satisfaction were not explored, leaving areas for future investigation.

CONCLUSION

Our findings add to a growing body of regional and international literature supporting early enteral feeding following gastrointestinal surgery. In the context of elective ileostomy closure, early oral intake is safe, reduces wound infections, and significantly shortens hospital stay. These benefits are especially relevant for resource-limited healthcare systems like Pakistan and other South Asian countries, where cost containment and efficient recovery are critical. We recommend the incorporation of early enteral feeding into standard postoperative care protocols for appropriate surgical candidates.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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3	Sana Akhtar Ansari: Data analysis.
4	Isha Nasar: Literature review.
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