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EFFECT OF CHEWING GUM ON GASTROINTESTINAL RECOVERY FOLLOWING ELECTIVE GYNECOLOGICAL ABDOMINAL SURGERIES: A RANDOMIZED CONTROLLED TRIAL

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Abstract

Objective: To assess the effectiveness of postoperative chewing gum in accelerating gastrointestinal recovery among women undergoing elective gynecological transabdominal surgeries.

Methods: This was a prospective, single-center, randomized controlled trial conducted at Saveetha Medical College & Hospitals, enrolling 50 adult female patients (aged 20–60 years) undergoing elective cesarean section or total abdominal hysterectomy. Participants were randomized into two equal groups (n=25 each): Group A (intervention) received sugar-free chewing gum for 20 minutes, three times daily, starting 6 hours post-surgery until first stool or 72 hours, while Group B (control) received standard postoperative care. Primary outcomes included time to first bowel sound, flatus, and defecation. Secondary outcomes were length of hospital stay, need for prokinetic drugs, and patient satisfaction (1–5 Likert scale). Nursing staff blinded to group allocation recorded outcomes. Data were analyzed using Student's t-test, Chi-square, or Fisher's exact test, with significance set at $p<0.05$.

Results: Baseline characteristics were comparable between groups. The chewing gum group demonstrated significantly faster gastrointestinal recovery. Mean time to first bowel sound was 9.4±2.1 hours in the chewing gum group vs. 13.6±2.8 hours in controls (p=0.001). Mean time to passage of flatus was 17.2±3.6 hours vs. 22.8±4.1 hours (p=0.003), and mean time to first defecation was 29.5±5.8 hours vs. 37.3±6.1 hours (p=0.002). Secondary outcomes also favored the intervention: mean hospital stay was significantly shorter (2.4±0.6 days vs. 3.1±0.9 days; p=0.014), and fewer patients required prokinetic drugs (8% vs. 28%; p=0.045). Patient satisfaction was significantly higher in the chewing gum group, with 60% reporting the highest score (5) vs. 28% in controls (p=0.016).

Conclusion: Postoperative chewing gum significantly accelerates gastrointestinal recovery, shortens hospital stay, reduces the need for prokinetic agents, and improves patient satisfaction among women undergoing elective gynecological abdominal surgeries. This simple, safe, and cost-effective intervention can be a valuable adjunct to enhance postoperative care in this patient population.

Keywords: Chewing gum, Postoperative ileus, Gastrointestinal recovery, Gynecological surgery, Abdominal hysterectomy, Cesarean section, Randomized controlled trial.

INTRODUCTION

Postoperative ileus, a common and often unavoidable complication following abdominal and pelvic surgeries, including gynecological procedures, significantly impacts patient recovery. It's characterized by delayed gastrointestinal motility, leading to symptoms like abdominal distension, pain, nausea, and delayed passage of

flatus and stool. These outcomes contribute to patient discomfort, prolonged hospital stays, and increased healthcare costs (1–3).

While pharmacological agents like prokinetics are often used to manage postoperative ileus, their effectiveness varies and they can come with undesirable side effects (1). This has led to a focus on simple, low-risk, non-pharmacological strategies to enhance recovery. One such approach is chewing gum, which acts as a form of sham feeding. By mimicking the act of eating, chewing gum is thought to stimulate the cephalic-vagal pathway, promoting the release of gastrointestinal hormones, enhancing salivary and gastric secretions, and facilitating early bowel motility (4).

Chewing gum has shown promise in improving gastrointestinal outcomes after colorectal and other general abdominal surgeries. Meta-analyses and randomized controlled trials have demonstrated that chewing gum can reduce the time to first passage of flatus, first bowel movement, and length of hospital stay (2,5,6). The proposed mechanisms include activation of the cephalic-vagal pathway and increased secretion of gastrointestinal hormones and fluids, which together enhance bowel motility (2,7).

However, evidence supporting its use specifically in gynecological transabdominal procedures, such as cesarean sections and abdominal hysterectomies, remains limited. Some studies and meta-analyses suggest that chewing gum after a cesarean section can significantly accelerate the recovery of intestinal function, reducing the time to first flatus, defecation, bowel sounds, and hospital stay, without notable side effects (8,9).

Given the high volume of these surgeries and the critical importance of early recovery, it's essential to evaluate interventions that are both effective and patient-friendly. Chewing gum, being a low-cost, well-tolerated, and easily implemented strategy, represents a promising adjunct to enhance postoperative recovery in gynecological surgery. However, larger, high-quality studies are still needed to confirm its efficacy in this specific patient population(9–11).

This study aims to assess the effectiveness of chewing gum in accelerating the return of bowel function following elective gynecological abdominal surgeries. Our primary objective is to evaluate the time to return of bowel activity, while secondary outcomes include hospital stay duration, need for rescue medications, and patient satisfaction.

METHODOLOGY

Study Design

This was a prospective, single-center, randomized controlled trial conducted in the Department of Obstetrics and Gynecology at Saveetha Medical College & Hospitals, designed to assess the effectiveness of postoperative chewing gum in accelerating gastrointestinal recovery following elective gynecological transabdominal surgeries.

Study Population

The study enrolled 50 adult female patients (age 20–60 years) scheduled to undergo elective transabdominal procedures such as cesarean section or total abdominal hysterectomy. Written informed consent was obtained from all participants.

Inclusion Criteria

- Women undergoing elective cesarean section or abdominal hysterectomy under spinal or general anesthesia.
- Hemodynamically stable postoperatively.
- Willingness to chew gum and provide informed consent.

Exclusion Criteria

- Emergency surgeries
- Bowel surgery or known gastrointestinal disorders (e.g., Crohn’s disease, IBS)
- Postoperative complications requiring ICU care
- Allergy to chewing gum ingredients
- Diabetes mellitus (due to altered GI motility)

Randomization and Group Allocation

Participants were randomly allocated into two equal groups (n=25 each) using a computer-generated randomization sequence:

- **Group A (Intervention):** Received chewing gum therapy postoperatively.
- **Group B (Control):** Received standard postoperative care with no chewing gum.

Intervention Protocol

Patients in **Group A** were instructed to chew sugar-free gum for **20 minutes**, **three times daily** (every 8 hours), beginning **6 hours after surgery**, and continuing until they passed the first stool or for a maximum of 72 hours postoperatively. Chewing was supervised during hospital stay to ensure compliance.

Outcome Measures

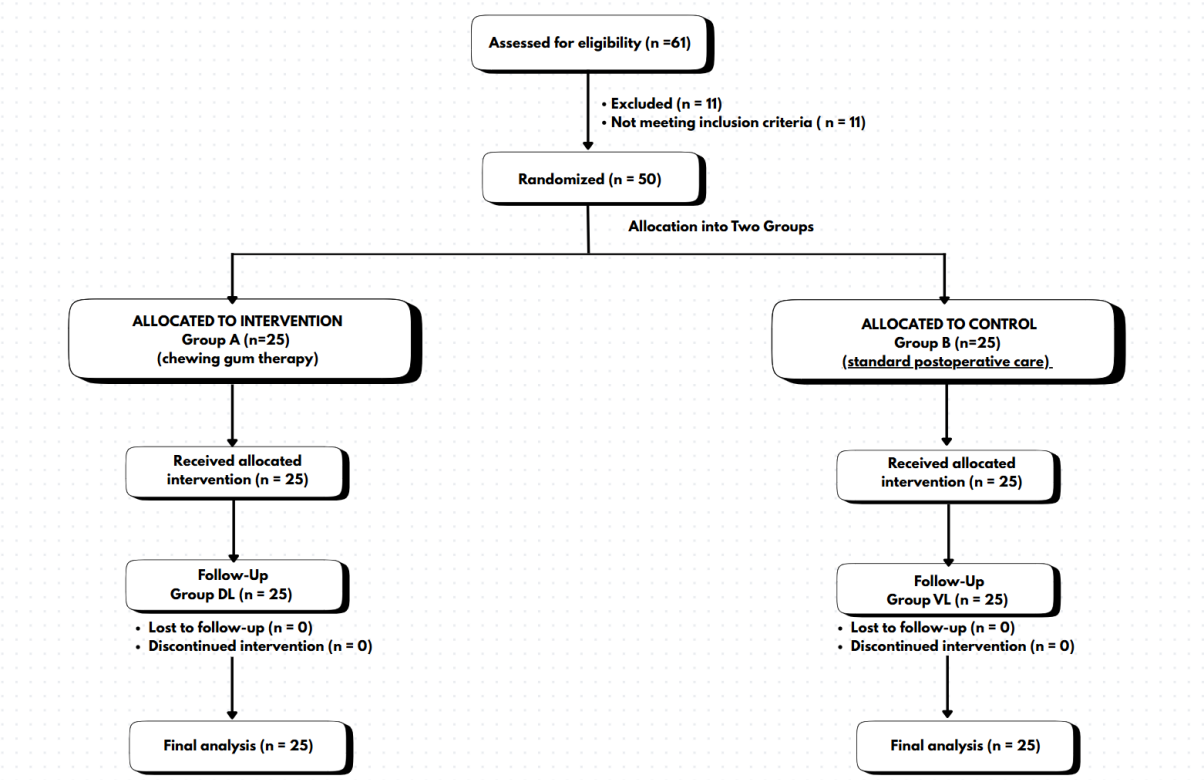
Primary and secondary outcomes were recorded by nursing staff blinded to group allocation:

- **Primary Outcome:** Time to return of bowel function, defined as:
  - Time to first bowel sound (hours)
  - Time to passage of flatus (hours)
  - Time to first defecation (hours)
- **Secondary Outcomes:**
  - Length of hospital stay (days)
  - Need for prokinetic drugs
  - Patient satisfaction score (1–5 scale)

Statistical Analysis

Data were analyzed using SPSS v25. Continuous variables were expressed as mean ± standard deviation (SD) and compared using Student's t-test. Categorical variables were analyzed using Chi-square or Fisher's exact test. A p-value of <0.05 was considered statistically significant.

Figure 1 COSORT Flowchart of study design



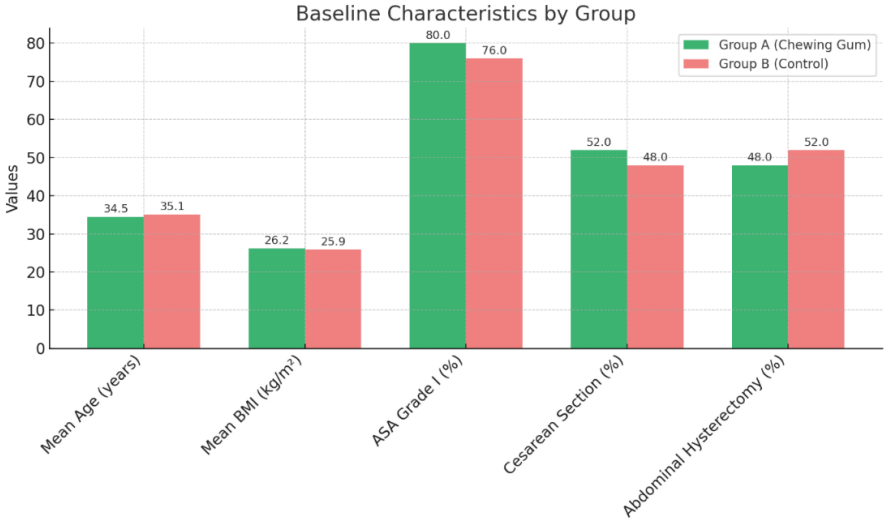
RESULTS

As presented in Table 1 and illustrated in Figure 2, both the chewing gum (Group A) and control (Group B) groups were well-matched across key demographic and clinical parameters at baseline. The mean age was similar between Group A (34.5±6.2 years) and Group B (35.1±5.8 years), with a p-value of 0.71. The distribution of surgical types (cesarean section vs. abdominal hysterectomy) was also comparable, with 52% of Group A and 48% of Group B undergoing cesarean section, and the inverse for abdominal hysterectomy (p=0.78). Mean Body Mass Index (BMI) showed no significant difference (26.2±2.1 kg/m2 for Group A vs. 25.9±2.5 kg/m2 for Group B; p=0.63). Furthermore, the proportion of patients classified as ASA Grade I was nearly identical (80% in Group A vs. 76% in Group B; p=0.73). This comparability at baseline minimizes potential confounding variables and strengthens the internal validity of our findings.

Table 1 and Figure 2. Baseline Characteristics of Participants

Parameter	Group A (Chewing Gum)	Group B (Control)	p-value
Mean Age (years)	34.5 ± 6.2	35.1 ± 5.8	0.71
Type of Surgery (%)			
• Cesarean Section	52%	48%	0.78
• Abdominal Hysterectomy	48%	52%	
Mean BMI (kg/m²)	26.2 ± 2.1	25.9 ± 2.5	0.63
ASA Grade I (%)	80%	76%	0.73

Figure 2

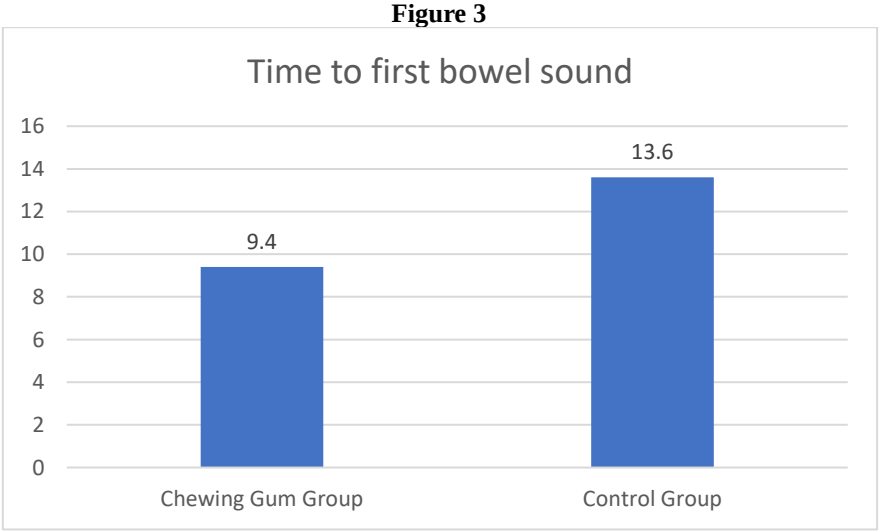


As detailed in **Table 2** and depicted in **Figure 3**, patients in the chewing gum group experienced a significantly earlier return of bowel sounds compared to the control group. The mean time to first bowel sound in the chewing gum group was 9.4±2.1 hours, whereas in the control group, it was 13.6±2.8 hours. This difference was statistically highly significant (p=0.001). This finding supports the hypothesis that sham feeding via chewing gum activates cephalic-vagal stimulation, thereby enhancing gastric secretions and initiating bowel motility sooner than with conventional postoperative care.

Table 2 and Figure 3. Time to First Bowel Sound (Hours)

Group	Mean ± SD (Hours)	p-value
Chewing Gum Group	9.4 ± 2.1	
Control Group	13.6 ± 2.8	0.001**

Figure 3

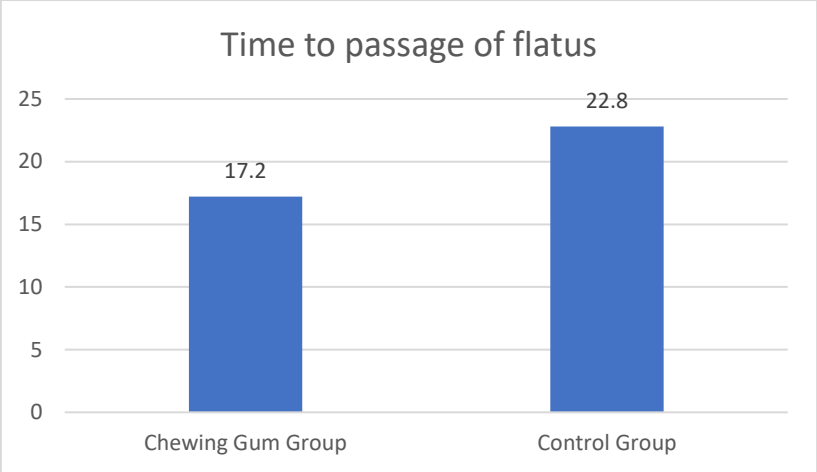


The mean time to first flatus, a recognized early marker of bowel motility, was significantly shorter in the intervention group compared to the control group, as shown in **Table 3** and **Figure 4**. Patients in the chewing gum group passed flatus at a mean of 17.2±3.6 hours, while those in the control group did so at 22.8±4.1 hours. This difference was statistically significant (p=0.003). This result further supports evidence from prior meta-analyses that gum chewing acts as a stimulant for bowel activity and could be a reliable non-pharmacological tool in preventing postoperative ileus.

Table 3 and Figure 4. Time to Passage of Flatus (Hours)

Group	Mean ± SD (Hours)	p-value
Chewing Gum Group	17.2 ± 3.6	
Control Group	22.8 ± 4.1	0.003**

Figure 4



As presented in Table 4 and illustrated in Figure 5, the interval to first defecation was significantly reduced in the chewing gum group (29.5±5.8 hours) compared to the control group (37.3±6.1 hours; p=0.002). This suggests that chewing gum effectively mimics the act of eating, thereby activating the cephalic phase of digestion and downstream peristaltic reflexes. Early bowel evacuation can reduce abdominal discomfort, distension, and the risk of paralytic ileus, thereby accelerating postoperative recovery.

Table 4 and Figure 5. Time to First Defecation (Hours)

Group	Mean ± SD (Hours)	p-value
Chewing Gum Group	29.5 ± 5.8	
Control Group	37.3 ± 6.1	0.002**

Figure 5.

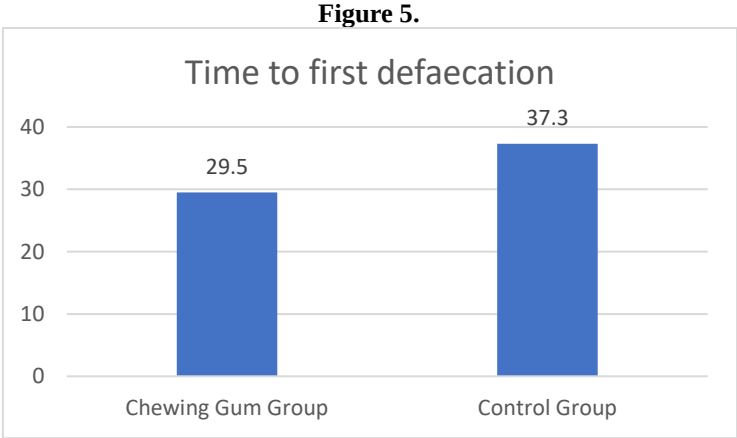


Table 5 summarizes the outcomes related to hospital stay and the need for prokinetic agents. Patients in the chewing gum group had a significantly shorter mean hospital stay (2.4±0.6 days) than those in the control group (3.1±0.9 days), reflecting faster gastrointestinal recovery and earlier discharge readiness (p=0.014). Furthermore, only 8% of patients in the chewing gum group required rescue prokinetic medications, compared to 28% in the control group. This significant difference (p=0.045) underscores the therapeutic efficacy of chewing gum as a standalone method to stimulate bowel activity and potentially reduce pharmaceutical interventions.

Table 5. Length of Hospital Stay and Prokinetic Use

Outcome	Group A (%) / Mean	Group B (%) / Mean	p-value
Mean Length of Stay (days)	2.4 ± 0.6	3.1 ± 0.9	0.014*
Required Prokinetic Drugs	8%	28%	0.045*

As detailed in **Table 6**, patient-reported satisfaction scores (on a 1–5 Likert scale, with 5 being highly satisfied) were significantly higher in the chewing gum group. Sixty percent of patients in the chewing gum group reported the highest satisfaction score (Score 5), compared to only 28% in the control group. Conversely, a smaller proportion of patients in the chewing gum group (8%) reported a satisfaction score of 3 or less, compared to 32% in the control group. This difference in overall satisfaction was statistically significant (p=0.016). The higher satisfaction rates in the intervention arm may be attributed to enhanced bowel comfort, earlier mobilization, and reduced need for pharmacologic support, demonstrating that patient-centered strategies like gum chewing can positively influence the subjective experience of surgical care alongside accelerating clinical recovery.

Table 6. Patient Satisfaction Scores (1–5 Likert Scale)

Satisfaction Level	Group A (%)	Group B (%)	p-value
Score 5 (Highly Satisfied)	60%	28%	
Score 4	32%	40%	
Score 3 or less	8%	32%	0.016*

DISCUSSION

This randomized controlled trial rigorously assessed the effectiveness of chewing gum in promoting postoperative gastrointestinal recovery among women undergoing elective gynecological abdominal surgeries. The principal findings clearly demonstrate that chewing gum significantly hastened the return of bowel function, shortened hospital stay, reduced the need for prokinetic agents, and improved patient satisfaction.

Our primary outcomes showed a statistically significant and clinically meaningful acceleration of gastrointestinal motility in the chewing gum group. The mean time to first bowel sound was 9.4±2.1 hours in the intervention group compared to 13.6±2.8 hours in the control group (p=0.001). Similarly, the mean time to passage of flatus was reduced from 22.8±4.1 hours (control) to 17.2±3.6 hours (chewing gum) (p=0.003), and the mean time to first defecation was 29.5±5.8 hours versus 37.3±6.1 hours, respectively (p=0.002).

Beyond bowel function, secondary outcomes also favored the intervention. The mean length of hospital stay was significantly shorter in the chewing gum group (2.4±0.6 days) compared to the control group (3.1±0.9 days; p=0.014). Furthermore, the need for prokinetic medications was substantially lower in the chewing gum group (8%) compared to the control group (28%; p=0.045). Patient-reported outcomes also revealed higher satisfaction, with 60% of patients in the chewing gum group reporting the highest satisfaction score (5 on a Likert scale) versus 28% in the control group (p=0.016).

Interpretation and Consistency with Other Evidence:

These findings strongly support the hypothesis that chewing gum activates the cephalic-vagal reflex, simulating sham feeding and thereby enhancing bowel motility by stimulating digestive secretions and neural pathways(1). Our results are highly consistent with a growing body of evidence from earlier studies and meta-analyses demonstrating the efficacy of chewing gum in reducing postoperative ileus and accelerating gastrointestinal recovery across various surgical disciplines, including colorectal and urological surgeries (12–14).

Specifically, the observed reduction in time to first bowel sound aligns with previous studies in gynecological and abdominal surgeries (7). The earlier passage of flatus is consistent with findings from numerous meta-analyses and RCTs on gum chewing (13,14). The reduction in hospital stay underscores faster postoperative recovery and earlier discharge readiness, a benefit reported in other surgical contexts (15).The decreased reliance on prokinetic agents further highlights the clinical utility of this non-pharmacological approach (13).

Improved patient satisfaction, likely due to earlier relief from abdominal discomfort, reduced bloating, and enhanced physical comfort, has also been noted in similar interventions (7).

Notably, while evidence in the gynecological population has been sparse, this study contributes valuable insights into the utility of chewing gum for women undergoing common procedures such as cesarean sections and abdominal hysterectomies, where postoperative morbidity related to bowel inactivity is considerable. Randomized trials in gynecologic surgery suggest that chewing gum is safe and may lower the incidence of postoperative ileus and nausea, although results across studies are not entirely consistent, indicating an ongoing need for further research (7,10,11)**.**

Limitations:

Despite the robust findings, certain limitations warrant acknowledgment. The relatively small sample size and single-center design may limit the external generalizability of these results to broader populations or different clinical settings. While compliance with chewing gum therapy was monitored during hospitalization, long-term adherence post-discharge was not applicable within the scope of this protocol. Furthermore, although objective measures were used, the subjective nature of patient satisfaction scores, while valuable, may be influenced by patient expectations.

Generalizability:

The participant cohort comprised women undergoing elective gynecological abdominal surgeries, common procedures with predictable recovery patterns. While the single-center nature of the study necessitates caution, the consistency of our findings with those from other surgical specialties suggests that the physiological mechanism activated by chewing gum is likely broadly applicable. However, replication in diverse populations and healthcare settings would strengthen the generalizability.

Implications for Practice and Future Research:

Given its safety, low cost, non-invasiveness, and ease of implementation, chewing gum represents a highly practical and beneficial adjunct to standard postoperative care in women undergoing gynecological abdominal surgeries. Its adoption could lead to reduced healthcare costs due to shorter hospital stays and decreased reliance on pharmacological interventions. Future research should consider larger, multi-center trials to confirm these findings and further assess cost-effectiveness. Additionally, exploring patient adherence strategies for longer-term benefits and investigating the optimal chewing gum regimen (e.g., duration, frequency, type) could provide further valuable insights.

CONCLUSION

This randomized controlled trial provides compelling evidence that the simple, low-cost intervention of chewing gum significantly accelerates postoperative gastrointestinal recovery in women undergoing elective gynecological abdominal surgeries. Chewing gum effectively reduced the time to first bowel sound, flatus, and defecation, subsequently leading to a shorter length of hospital stay and a decreased need for prokinetic medications. Furthermore, the intervention significantly improved patient satisfaction with their postoperative experience. These findings underscore the clinical utility of chewing gum as a safe and effective adjunct to standard postoperative care, contributing to enhanced patient comfort and potentially reducing healthcare resource utilization in this surgical population.

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