The use of nonpharmacological agent to accelerate gastrointestinal recovery in patients undergoing pancreatic head resection

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Background
Ileus is a frequent complication following abdominal surgery that can cause a delay in recovery. Ileus onset is thought to be complex, and several prevention strategies have been researched. According to the study's hypotheses, chewing gum promotes quicker recovery of gastrointestinal function, which reduces the risk of postoperative ileus.
Aim
To investigate the impact of chewing gum on hospital stay and bowel movement in individuals undergoing whipped surgery.
Patients and methods
This is a prospective randomized controlled study that included 40 cases, randomly assigned into two groups; 20 cases took chewing gum after whipped operation and 20 cases were not, which were randomly selected and were operated in the Department of Surgery, Assiut University hospitals.
Results
The findings of this study showed that there was a highly significant difference between the study group and control group as regards all items related to postoperative findings at *P* value 0.05, and there was a highly significant difference as regards satisfaction score between the study group and control group at *P* value 0.001.
Conclusion
Based on the findings of this study, we concluded that chewing gum is an efficient way to reduce the frequency and length of Postoperative Ileus in patients who have had whiple surgery and are returning from the hospital.

Keywords:
gastrointestinal recovery, nonpharmacological agent, pancreatic head resection

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Introduction

The most frequent operation to remove pancreatic tumours is the Whipple procedure, also known as a pancreaticoduodenectomy. The best hope for long-term management of all kinds of pancreatic cancer is through surgery to remove a tumour. The Whipple is a challenging and involved procedure that involves removing and reconstructing a significant portion of the digestive system. The Whipple method may be used to remove (resect) a tumour that is in the head of the pancreas, has not spread to other parts of the body, and is amenable to surgery. In a conventional Whipple treatment, the surgeon removes the head of the pancreas, the gallbladder, the duodenum, a part of the stomach, and nearby lymph nodes, even though 20% of pancreatic cancer patients may be suitable for surgery. The surgeon then reconnects the remaining pancreas and digestive organs [1].

Patients may occasionally have a modified Whipple technique that leaves the pylorus and the whole stomach in place. A pylorus-preserving Whipple is what this is. Usually, both kinds of operation last 5–7 h.

After a Whipple surgery, the patient stays in the hospital for 8–10 days. Doctors keep an eye out for problems while the patient gradually resumes eating and drinking.

After abdominal surgery, postoperative ileus (POI) is a typical occurrence. POI is defined as 'two or more of nausea/vomiting, inability to tolerate oral diet over 24 h, absence of flatus over 24 h, distention and radiologic confirmation on or after day 4 postoperatively without prior resolution' and is the time between surgery, passage of flatus/stool, and tolerance of oral diet. Prolonged POI is defined as

'two or more of these symptoms' [1]. The sympathetic nervous system and inhibited extra cerebral signaling are two of the primary causes, along with local and systemic inflammation as well as endocrinological and hormonal impacts [2]. Vomiting, nauseousness, and stomach discomfort are common signs of POI. POI is very common, thus it is seen as a typical postoperative response [3].

However, a longer POI causes the patient to have more symptoms and a protracted hospital stay [4].

Both pharmaceutical and non-pharmacological methods and treatments have been studied to prevent or minimize POI. One of these tactics is chewing gum. Prior research has demonstrated positive outcomes following urological, colorectal, gynecological, and liver surgery [3,5]. According to this research, utilizing chewing gum resulted in a much shorter time before the first postoperative bowel movement, the first flatus, the first stool, and a shorter hospital stay [6].

Patients and methods

A prospective, randomized, and controlled study was carried out at the Assiut University hospitals' Department of Surgery. A total of 40 patients were enrolled in this investigation and randomly divided into two groups:

(1) Group A: 20 cases received chewing gum after Whipple operation.
(2) Group B: 20 cases not received chewing gum as control group.

Inclusion Criteria for study group:

(1) Pancreatic or periampullary malignancy with a pancreaticoduodenectomy planned.

Exclusion Criteria for groups:

(1) Ongoing treatment for mental disease.
(2) Diagnosed neurological injuries or diseases affecting the ability to swallow or gastric function.
(3) Ongoing abuse of alcohol or other drugs.
(4) Previously known allergies to the content of chewing gum.
(5) Additional surgery after primary surgery.
(6) The procedure proved not to be radical curative surgery.
(7) Previous abdominal surgery.

Methods

The eligible patients included in this study were subjected to the following:

(1) Informed consent was obtained from each participant.
(2) Full history including:
    (a) Patient personal data: age, sex, smoking, occupation, and residence.
    (b) Medical and family history.
(3) Preoperative variables such as ASA grade and BMI.
(4) Laboratory investigations:
    (a) About 5 ml blood volume was withdrawn from each participant once.
    (b) Complete blood count (CBC), prothrombin time and concentration and renal functions tests.
    (c) Serum albumin, serum bilirubin, C-reactive protein (CRP), and procalcitonin levels.
(5) Imaging;
    (a) Abdominal Ultrasonography (Abd U/S). For each participant, an ultrasound scan was performed. The ultrasound machines used were CX30 (Philips Healthcare, Washington) and an HD15 (Philips Healthcare).
    (b) Abdominal erect radiography.
(6) Procedure:
    (a) A computer-generated random table was used.
    (b) The treatment group received chewing gum and standard care while the Control group received standard care and sips of glucose, in total 3.6 g/day in a 12 ml mixture per day, the same amount of glucose per day as the treatment group received via the chewing gum.
    (c) Any commercially available chewing gum was employed, with its primary components being latex, glucose, and the patients' choice of natural flavors like lime or spearmint.
    (d) The day following surgery, patients began chewing after they left the intensive care unit. Chewing gum was given out every four hours (from 8:00 a.m. to 12:00 p.m., 12:00 p.m. to 16:30 p.m.). The patients chewed two pieces of gum for 30 min every four hours. In addition to the usual clinical information, the duration until the first postoperative farts and faces were noted.
(7) Outcome measures:
    (a) Primary (main):
        (1) Initial flatus following surgery [time period: within the first 21 days after

surgery, from the day of surgery to the first postoperative flatus].
(2) The day following surgery until the first bowel movement (during the first 21 days)
(3) The amount of time spent in the hospital [date of operation to surgical ward release (within the first 21 days)].

(b) Secondary (subsidiary):
(1) The beginning of clear fluids [date of operation to beginning of clear fluids during the first 21 days].
(2) Beginning of a liquid diet [date range: during the first 21 days following the surgery, from the day of the operation to the beginning of the liquid diet].

Ethical consideration

(1) Study protocol had been submitted for approval by Institutional Review Board, Assiut University.
(2) Informed verbal consent had been obtained from each participant sharing in the study.
(3) Confidentiality and personal privacy had been respected in all levels of the study.

Time schedule

Topic	Period
Preparatory phase	One month
Design of examination sheet	One months
Review of literature	Two months
Collection, organization, entering of data and statistical analysis	Two months

Data management and statistical analysis

Microsoft Excel software was used to code, input, and analyses historical data, basic clinical examinations, laboratory investigations, and outcome measurements. The Statistical Package for the Social Sciences (SPSS version 20.0) programmed was then used to import the data and perform analysis. The following tests were employed to determine if differences were significant, depending on the type of data: correlation using Pearson's correlation or Spearman's correlation, quantitative group representation by mean SD, and qualitative representation as number and percentage.

P value; level of significance:

(1) *P* greater than 0.05; nonsignificant (NS).
(2) *P* less than 0.05; significant (S).
(3) *P* less than 0.01; highly significant (HS).

Descriptive statistics

For parametric numerical data, we use mean, standard deviation (SD), and range; for nonparametric numerical data, we use median and interquartile range (IQR). proportion and frequency of non-numerical data.

Analytical statistics

The statistical significance of a difference in a nonparametric variable between more than two research groups was evaluated using the Kruskal-Wallis test.

Table 1 Comparison between the two studied groups according to Socio-demographic data

	Study group (*n*=30) No. (%)	Control group (*n*=30) No. (%)	Test of Significanc	*P*
Sex				
Male	16 (53.3)	15 (50.0)	χ^2=1.36	0.179
Female	14 (46.7)	15 (50.0)		
Age (y)				
Min. – Max.	18.0–88.0	18.0–77.0	*t*= 0.78	0.085
Mean±SD.	65.9±9.82	63.2±10.84		
Median (IQR)	63.0 (62.0–70.50)	61.0 (59.0–71.0)		
BMI (Kg/m^2)				
Min. – Max.	18.0–40.0	18.0–40.0		
Mean±SD.	26.64±5.82	29.42±6.84	*t*= 0.78	0.613
Median (IQR)	43.0 (42.0–60.50)	41.0 (42.0–71.0)		
Occupation				
Employer	15 (50.0)	14 (46.7)		
Not Employer	15 (20.0)	16 (53.3)	χ^2=1.096	0.089
Marital status				
Single	4 (13.3)	7 (23.3)		
Married	25 (83.3)	22 (73.3)	χ^2=3.01	0.390
Divorced	1 (3.3)	1 (3.3)		

χ^2, Chi square test; FE, Fisher Exact; IQR, Inter quartile range; SD, Standard deviation; t, Student *t*-test. *P*; *P* value for comparing between the studied groups. *; Statistically significant at *P* less than or equal to 0.05.

Results

Table 1 displays the socio-demographic data distribution of the researched participants. The average ages of the study and control groups were almost identical (40.6 9.82 and 44.42 10.84, respectively). In terms of sex, it was discovered that women made up the biggest percentages in both the study and control groups (63.3% and 56.7%, respectively). In terms of occupation, it was observed that employers made up the biggest percentages in both the study and control groups, at 50% and 46.7%, respectively. In terms of marital status, the results showed that the biggest percentages (83.3% and 73.3%) in the study and control groups, respectively, were married. Regarding the sociodemographic data, there was no statistically significant difference between the two groups ($P>0.05$).

Table 2 presents a comparison the population characteristics between the Study and the control groups. No statistically significant differences could be Detected between the two groups as regards to smoking, ASA score and past medical history. ($P=0.179$, 0.741, and 0.110, respectively).

Table 3 shows that no statistically significant differences were detected between the two groups regarding operation data ($P>0.05$).

Table 4 reflected that there were statistically significant differences between study and control group regarding abdominal distension and vomiting as documented by P value (0.000).

Table 5 detected that, there was high significant difference between control and study group in all items related to postoperative findings at P value less than 0.05.

Table 6 showed that there was highly significant difference between study group and control group as regards satisfaction score which in favor of study group with P value less than 0.001.

Discussion

The pancreatoduodenectomy, sometimes referred to as the Whipple surgery, is the surgical method of choice for pancreatic ductal adenocarcinomas that are respectable or borderline respectable. The

Table 2 Comparison between the two studied groups according to Health data

	Study group (n=30) No. (%)	Control group (n=30) No. (%)	Test of Significance	P
Smoking				
Yes	11 (36.7)	13 (43.3)	χ^2=1.36	0.179
No	19 (63.3)	17 (56.7)		
ASA score				
I	19 (63.3)	17 (56.7)	χ^2=2.45	0.741
II – III	11 (36.7)	13 (43.3)		
Past Medical History				
CVD	4 (13.3)	3 (10.0)		
CAD	3 (10.0)	4 (13.3)		
Anemia	2 (6.7)	3 (10.0)	χ^2=1.096	0.110
DM	4 (13.3)	2 (6.7)		
Hypertension	7 (23.3)	4 (13.3)		

χ^2, Chi square test; FE, Fisher Exact; IQR, Inter quartile range; SD, Standard deviation; t, Student t-test. P; P value for comparing between the studied groups. *; Statistically significant at P less than or equal to 0.05.

Table 3 Comparison between the two studied groups according to operation data

	Study group (n=30) No. (%)	Control group (n=30) No. (%)	Test of Significance	P
Duration of Surgery (min)				
Mean±SD.	419.4±96.15	443.4±97.18	t= 1.13	0.051
Operative blood loss (ml)				
Mean±SD.	971±900.15	1220±1650.2	t= 2.41	0.248
Complication				
Yes	2 (6.7)	3 (10.0)	χ^2=0.865	0.519
No	28 (93.3)	27 (90.0)		

χ^2, Chi square test; FE, Fisher Exact; IQR, Inter quartile range; SD, Standard deviation; t, Student t-test. P; P value for comparing between the studied groups. *; Statistically significant at P less than or equal to 0.05.

Table 4 Comparison between the two studied groups according to Follow-up after surgery

	Study group (*n*=30) No. (%)	Control group (*n*=30) No. (%)	Test of Significance	*P*
Abdominal Distension				
Yes	0	17 (66.7)	**χ^2=23.721***	**<0.001***
No	30 (100.0)	13 (43.3)		
Vomiting				
No	18 (60.0)	7 (23.3)		
1–3	6 (20.0)	15 (50.0)	**χ^2=8.983***	**0.011***
> 3	6 (20.0)	8 (26.7)		
Pain				
0	7 (23.3)	14 (46.7)		
1	10 (30.0)	8 (26.7)	χ^2=1.887	0.618
2	13 (43.3)	6 (20.0)		
3	0	2 (6.7)		
Postoperative Ileus				
Yes	3 (10.0)	5 (16.7)	χ^2=0.897	0.248
No	27 (90.0)	25 (83.3)		

χ^2, Chi square test; FE, Fisher Exact; IQR, Inter quartile range; SD, Standard deviation; t, Student *t*-test. *P*; *P* value for comparing between the studied groups.P^2; *P* value for comparing between **Pre-Intervention** and **Post-Intervention** in each group. *; Statistically significant at *P* less than or equal to 0.05.

Table 5 Comparison between the two studied groups according to Postoperative findings

	Study group (*n*=30) No. (%)	Control group (*n*=30) No. (%)	Test of Sig.	*P*
Time to first flatus (days)				
Mean±SD.	3.7±1.04	6.4±4.1	**t= 2.16**	**0.024***
Time to first defecation (days)				
Mean±SD.	7.6±2.7	10.5± 6.2	**t= 4.13**	**0.001***
Start of clear fluids (days)				
Mean±SD.	6.4±2.7	7.7±4.5	**t= 6.097**	**0.004***
Start of liquid diet (days)				
Mean±SD.	5.1±2.7	9.2±5.9	**t= 2.979**	**0.020***
Length of hospital stay (days)				
Mean±SD.	18.0±4.9	26±7.9	**t= 5.999**	**0.003***

χ^2, Chi square test; FE, Fisher Exact; IQR, Inter quartile range; SD, Standard deviation; t, Student *t*-test. *P*; *P* value for comparing between the studied groups. *; Statistically significant at *P* less than or equal to 0.05.

Table 6 Comparison between the two studied groups according to Satisfaction

	Study group (*n*=30) No. (%)	Control group (*n*=30) No. (%)	Test of Significance	*P*
Satisfied				
Yes	30 (100.0)	27 (90.0)	**t= 5.76**	**0.001***
No	0	3 (10.0)		

χ^2, Chi square test; FE, Fisher Exact; IQR, Inter quartile range; SD, Standard deviation; t, Student *t*-test. *P*; *P* value for comparing between the studied groups. *; Statistically significant at *P* less than or equal to 0.05.

complicated and extremely difficult intra-abdominal dissection as well as the restoration of the digestive system make this surgical technique extremely challenging for the surgeons. This technique has previously been linked to greater mortality and perioperative morbidity due to its complexity [7].

After abdominal surgery, POI is a typical occurrence. POI is defined as 'two or more of nausea/vomiting, inability to tolerate oral diet over 24 h, absence of flatus over 24 h, distention and radiologic confirmation on or after day 4 postoperatively without prior resolution' and is the time between surgery, passage of flatus/stool, and tolerance of oral diet. Prolonged POI is defined as 'two or more of these symptoms' [8].

The major cause is thought to be a combination of mechanisms, including endocrinological and hormonal impacts, restricted extra cerebral signaling, the sympatric nervous system, local and systemic inflammatory responses, and obstructed extra cerebral signaling [9].

Vomiting, nauseousness, and stomach discomfort are common signs of POI. POI is very common; thus it is seen as a typical postoperative response. However, a longer POI causes the patient to have more symptoms and a protracted hospital stay [10].

Both pharmaceutical and nonpharmacological methods and treatments have been studied to prevent or minimize POI. One of these tactics is chewing gum. Prior research has demonstrated positive outcomes following urological, colorectal, gynecological, and liver surgery [11–13]. According to these trials, utilizing chewing gum resulted in a considerably shorter hospital stay, initial flatus and stool, and time to the first postoperative bowel movement. Additionally, two meta-analyses [14,15] discuss the advantages for postoperative recovery. Sham-feeding, a gastrointestinal response to neuronal and endocrine impact comparable to that of eating but without the passage of food or liquids to the stomach, may be one explanation for these findings.

Swoboda 15 found that chewing gum enhanced salivary and gastrointestinal secretions during the cephalic period. The initial phase of digestion (the cephalic phase) is triggered by the movement of the jaw and increased salivation, which prepares the stomach for food.

Chewing gum seems to be a secure and affordable technique to promote stomach motility. Studies reveal that some postoperative patients who chew gum experience a shorter period between the passing of flatus and the first faces. Gum chewing has not been associated with any negative side effects, and patients have been able to manage it the day following surgery. There have not been many research done on this subject. As part of the multimodal programmed, it is crucial to keep looking at the usage of chewing gum. Although studies have not shown any negative consequences from chewing gum, choking and aspiration are still possibilities. It is not always acceptable for patients to chew gum [16].

As a result, we carried out this research to examine how chewing gum affects patients who have a whiple operation's return of bowel movement and length of hospital stay.

The 40 cases were part of a prospective, randomized, controlled trial. They were divided into two groups at random and underwent whipped surgery at the Department of Surgery, Assiut University Hospitals, with 20 instances taking chewing gum and 20 cases not.

Our data showed how the study individuals were distributed based on sociodemographic information. The average ages of the study and control groups were almost identical (40.6 9.82 and 44.42 10.84, respectively). In terms of sex, it was discovered that women made up the biggest percentages in both the study and control groups (63.3% and 56.7%, respectively). In terms of occupation, it was observed that employers made up the biggest percentages in both the study and control groups, at 50% and 46.7%, respectively. In terms of marital status, the results showed that the biggest percentages (83.3% and 73.3%) in the study and control groups, respectively, were married. In terms of sociodemographic statistics, there was no statistically significant difference between the two groups ($P>0.05$).

The analysis by Saraee *et al*. [17] revealed that the patients had a mean age of 58.4 years and were 40% male. 35.1% of patients were above 65 years old, which is a share. The youngest patient was 29 years old, while the oldest was 78.

A total of 60 surgeries were carried out from January 2014 to December 2018 for the Changazi *et al*. [18] research. However, the operation was abandoned (just palliative procedure) when three patients revealed metastatic characteristics after examination. As a consequence, 57 individuals in all had the Whipple treatment. 19 of the 57 patients were women, and 38 were men. The patients' average age was 53 +/– 05 years. Jaundice was the most prevalent presenting symptom, occurring in 39 (68.4%) cases, followed by stomach discomfort in 32 (56.1%) cases, and other symptoms including vomiting, fever, and weight loss, in that order.

Karim *et al*. [19] monitored 98 patients who had the Whipple operation between 2010 and 2017. The age ranged from 13 to 83 years, with a mean age of 55.9 +14.7 years. With a male to female ratio of 2 to 1, there were 66 male patients and 32 female patients. The majority of our patients were between the ages of 51 and 60, and 30 (30.6%) of them smoked.

When we analyzed the population characteristics of the study and control groups, we discovered that there were no statistically significant differences between them in terms of smoking, ASA score, or prior medical history. *P* values are 0.179, 0.741, and 0.110, respectively.

Ward-Boahen and Wallace-Kazer [20] They conducted correlations between the ASA grade, age, predicted blood loss, surgery duration in minutes, and length of stay in days to ascertain if physical state/ operative status was connected to the surgical results. The patients' median ASA score was 3. One patient only received an ASA rating of 1 (comorbidity-free, healthy patient). Age, anticipated blood loss, ASA grade, or duration of stay were not related. The ASA grade and minutes spent in the operation room had a positive connection ($P = 0.001$).

Additionally, our results demonstrated that there were no operational data, such as surgery length, blood loss, and complications, that exhibited any statistically significant differences between the two groups ($P > 0.05$).

In another setting, Romano *et al.* [21] discovered that the average length of the Whipple operation in their research was (295 min), which was much less than the average length of 376 min seen in Saraee *et al.* [17] 's study. Additionally, Changazi and colleagues discovered that the average operation took 31 538.3 min.

Nevertheless, compared with Changazi and colleagues, Romano and colleagues, and Saraee and colleagues, our study found a longer duration with a mean of 419.4 96.15.

Since Saraee *et al.* discovered the mean blood loss during surgery was 500 ml and it was somewhat higher than previous studies, subsequent studies reported reduced blood loss during surgery, in contrast to our data that revealed mean operative blood loss (ml) 971 900.15. Romano and co. The median blood transfusion was 1 (range 0–3) units, while the mean blood loss was 450 ml (range 250–700 ml). The average amount of blood lost after surgery was 500 130 ml, according to Changazi *et al.*

The average hospital stay was 10 days and 6 nights. The pancreatic fistula leak (12%), which was the main postoperative consequence [18].

Delay in stomach emptying was the most frequent postoperative complication, according to Saraee *et al.* [17], at 32.9%. GI leakage was associated with gastro-jejunostomy anastomosis failure, while biliary fistula was brought on by rupture or leaking of the choledocojejunostomy anastomosis. Cardiovascular issues such cardiac arrhythmias (21.4%), pneumonia (10%), hemorrhage (7.1%), biliary fistula (2.9%), and renal failure (5.7%) made up the majority of these patients' morbidities. wound infection (17.1%) and delayed emptying (32.9%) were minor problems.

Our findings showed that there were statistically significant differences in abdominal distension and vomiting between the study and control groups, as shown by the *P* value (0.000).

Furthermore, we discovered that all items connected to Postoperative results had a very significant difference between the control and research groups at *P* value 0.05.

Additionally, our results revealed a highly significant difference between the study group and control group in terms of satisfaction score, with a *P* value of 0.001 favoring the study group.

Of the 28 patients who were included in the Andersson and colleagues trial, 14 were randomly assigned to the intervention group and 14 to the control group. Compared with four patients in the control group, seven patients in the intervention group made the decision to stop taking part in the trial. The majority of them stopped taking part due to postoperative side effects such pain, nausea, or exhaustion. The intervention group outperformed the control group in terms of the remaining patients' mean times to their first flatus, their first faces, the onset of clear fluids, the beginning of their liquid diet, and their duration of hospital stay, however these differences were not statistically significant.

Although chewing gum usage for POI was not statistically significantly different from that of the control group in this trial, there was a trend towards lessened POI effects among patients who had undergone pancreatic surgery. Additionally, it provides excellent methodological experience that will be crucial for future research on therapies using chewing gum during pancreatic surgery recovery [9].

In the same vein, Story and Chamberlain 24 came to the conclusion that while several of these tactics have shown promise, neither prevention nor treatment of POI have been adequately proved by any one strategy. The time it takes for normal bowel function to recover and the length of the hospital stay both significantly reduce when these techniques are used as part of a fast-track multimodal treatment strategy. To offer precise suggestions about the elements of fast-track procedures that are most advantageous, more research is required.

Wronski 25 discovered that all prospective randomized controlled studies comparing people chewing gum with a control therapy following abdominal surgery (other than a caesarean section) were included; an outcome measure was necessary as a dependent variable. This conclusion is consistent with our own. In every study, patients in the experimental gum-chewing group passed flatus and defecated earlier than those in the nonexperimental gum-chewing control group. Except for one experimental group, individuals evaluated for duration of stay spent less time in the hospital. Postoperative gum chewers had lower POI, quicker flatus passage, earlier bowel movements, shorter hospital stays, and higher patient satisfaction scores. Gum chewing is advised as an additional treatment to lessen postoperative POI.

In the same vein, Asao and colleagues study in Japan, which included 26 of 19 patients who underwent laparoscopic colectomies, discovered that gum-chewing participants recovered bowel function more quickly than those who did not. Patients who chewed gum had bowel movements and passed flatus considerably more quickly than those who did not. Flatus was diagnosed on average at postoperative day 2.1, which is a lot sooner than the average day 3.2 found in the control group. The results of this study also showed that among the patients who chewed gum, the first faces came 2.7 days earlier. On the first postoperative day, it was discovered that the patients could tolerate chewing gum. This group of researchers concluded that there was no significant decrease in length of hospital stay, but they still recommend gum chewing as an adjunct therapy.

Additionally, Jang *et al.* [12] discovered that the control group had greater mean values for initial flatus time and xerostomia than the gum-chewing group did. After adjusting for hospitalization days, operation time, and painkiller dosage, the gum-chewing group had substantially lower first flatus time and xerostomia grade than the control group. Therefore, after elective open liver resection, patients who were directed to eat gum after surgery showed quicker bowel function recovery and lower xerostomia grade than individuals who did not.

Kouba *et al.* [11] osbserved that patients who got gum had shorter times to become flatus than did controls (2.4 vs. 2.9 days; *P* 0.001). Additionally, those who received gum experienced shorter times between bowel movements (3.2 vs. 3.9 days; *P* 0.001). Between patients who chewed gum and controls, there was no discernible difference in the number of days spent in the hospital (4.7 vs. 5.1 days, respectively; *P*=0.067). All patients tolerated chewing gum nicely.

Leier 18 discovered research that showed chewing gum reduced the time it took for a patient to have their first flatus and bowel movement following surgery. According to studies, chewing gum can shorten hospital stays by one day. There are no known negative effects of chewing gum. Gum chewing is a useful component to a multimodal treatment plan since it lowers healthcare costs while also improving patient comfort and satisfaction.

Our main findings

Data showed how the study individuals were distributed based on sociodemographic information. The average ages of the study and control groups were almost identical (40.6 9.82 and 44.42 10.84, respectively). In terms of sex, it was discovered that women made up the biggest percentages in both the study and control groups (63.3% and 56.7%, respectively).

In terms of sociodemographic statistics, there was no statistically significant difference between the two groups ($P>0.05$).

We discovered that there were no statistically significant differences between the two groups in terms of smoking, ASA score, or prior medical history. *P* values are 0.179, 0.741, and 0.110, respectively.

According to the *P* value (0.000), there were statistically significant differences between the study and control group in terms of abdominal distension and vomiting.

At a *P* value of 0.05, we discovered that there was a very significant difference between the control and study groups on all items pertaining to postoperative results.

Regarding Satisfaction score, there was a very significant difference between the study group and control group, favoring the study group with a *P*-value of 0.001.

Limitations of our study

The study's location was only one of several restrictions. It happened in a little neighborhood hospital.

The tiny sample size of the study was another drawback. Results might be skewed by using a small sample size (in this example, nine patients).

Because it lacked sufficient power. A multi-institutional randomized trial must be done in order to have enough power. Multiple surgical procedures, specialization, and institutional diversity will need to be controlled. Comparable control groups and the chance to examine other effects like comorbidities and performance status would be made possible by a multi-institutional investigation.

Conclusion

Based on our findings, we concluded that chewing gum is an efficient way to reduce the frequency and length of Postoperative Ileus in patients who have had while surgery and are returning from the hospital.

As this low-cost procedure has been demonstrated to boost patient comfort and lower healthcare expenses, further research must be done to outline the advantages and hazards of gum chewing.

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Conflicts of interest

There are no conflicts of interest.

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