



EFFICACY OF CHEWING GUM AND ACUPRESSURE IN DIGESTIVE FUNCTION POST-ABDOMINAL SURGERY: A SYSTEMATIC REVIEW

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ABSTRACT

Recovery of digestive function after abdominal surgery is often a challenge for patients, mainly due to nutritional disturbances caused by pain and inability to eat. This can slow down the healing process and prolong recovery time. Pain in the surgical area also inhibits patient movement, which worsens gastrointestinal motility. Complications such as difficulty in flatus and defecation can result in abdominal distension and increase length of hospitalization. This study aims to explore the effectiveness of non-pharmacological interventions, namely chewing gum and acupressure, in accelerating the recovery of gastrointestinal function in patients after abdominal surgery. Methods: The search strategy involved a systematic review using four electronic databases: Pubmed, Science Direct, Proquest, Taylor and Francis, and Scopus. The search was conducted on February 20, 2024, and focused on articles published from 2019 to 2024 in English. The search terms "Chewing Gum" AND "Acupuncture" OR "Acupuncture Points" OR "ST 36 Point" AND "Non-pharmacological Therapy" AND "Postoperative Period" AND "Abdominal Surgery" AND "Digestive" AND "System" AND "Function" AND "Recovery". After removing duplicates and filtering based on title, abstract, and eligibility, 18 articles were selected for the review using PRISMA. Result: The study found 1.098 articles and reviewed 18 articles the study reviewed the effectiveness of non-pharmacological interventions, specifically chewing gum and acupressure, in enhancing digestive recovery following abdominal surgery. Results indicated that both methods significantly improved gastrointestinal function, evidenced by faster bowel motility and reduced hospital stays. The findings suggest that implementing these interventions could provide effective support in postoperative care, addressing common complications such as delayed bowel movement and abdominal distension. Conclusion: The combination of chewing gum and acupressure can significantly accelerate the recovery of digestive function in post-abdominal surgery patients, making it an effective non-pharmacological method to improve post-surgical care.

Keywords: acupressure; chewing gum; postoperative recovery

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INTRODUCTION

Early recovery of digestive function following abdominal surgery can be challenging for some patients. One issue that often arises is nutritional disturbances, where patients do not get enough intake due to pain and inability to eat. This can slow down the healing process and prolong recovery time. In addition, the presence of intense pain in the surgical area can inhibit the patient's movement, which in turn can exacerbate indigestion. Among the most common problems experienced after abdominal surgery is delayed gastrointestinal motility due to changes in the autonomic nervous system. This condition that occurs in the gut inhibits gastrointestinal motility for several days and temporarily weakens intestinal peristalsis (Kanza Gul and Solt Kırcı, 2021). According to (Manisha, 2020) Postoperative complications such as difficulty flatus, difficulty defecating, loss of appetite, nausea, and vomiting experienced after surgery due to slowing of the digestive system. The clinical characteristics of these post

abdominal surgery complications are abdominal distension and the inability to release flatus and defecation and defecation pain, these conditions can hinder recovery, increase length of hospital stay (LOS) and higher treatment costs (Atkinson et al., 2016). Increased Level of Consciousness (LOS) may contribute to an increased incidence of post-abdominal surgery patients experiencing prolonged recovery of digestive function.

Post-abdominal surgery patients experience prolonged recovery of digestive function with an incidence of 17.4% and 24% in Korea (Lee et al., 2016). The incidence of prolongation of bowel noise and flatus time by 14% also occurred in post laparotomy gynecological surgery patients in China (Tazegül Pekin et al., 2015). An average of 10%-30% of post abdominal surgery patients experience abdominal distension and delayed return of bowel function in Japan (Venara et al., 2016). The incidence of prolongation of bowel noise and flatus in colorectal surgery is 14% in the USA (Muphy, Tevis and Kennedy, 2016). Oral diet intolerance in post abdominal surgery patients was reported at 27% due to nausea and vomiting (de Leede et al., 2018). The return of motility is usually first seen in the small intestine in less than 24 hours, then in the stomach between 24 and 48 hours, and finally in the colon after more than 48 hours. Intestinal motility can be stimulated by chewing sweets that evoke the fegal cephalic reflex so as to increase gastrointestinal hormones consisting of gastrin, secretin, gastric inhibitory polypeptide, cholecystokinin, pancreatic peptide, and enteroglucagon which play a role in the function of movement and regulation of digestive system secretions so that saliva and fluid secretions increase. Gastrin and neurotensin can increase gastrointestinal mortality (Putra et al., 2023) and chewing sugar-free gum after colorectal surgery can significantly improve the recovery of bowel movements by accelerating the time of first auscultation of bowel sounds, first discharge of flatus, and reduction in length of hospitalization (Al-kharabsheh et al., 2023).

As non-pharmacological interventions, acupuncture and acupressure have been investigated as adjunctive therapies to prevent Postoperative Ileus. Acupuncture and acupressure are popular and effective alternative treatments for functional gastrointestinal disorders after general anesthesia, sectio cesarea and gynecological laparoscopy, as supported by several studies. Acupressure works by engaging the vagal and parasympathetic pathways, releasing acetylcholine, promoting the release of adrenal cortex hormones, and inhibiting the inflammatory response of the gastrointestinal system. Thus, acupressure presents an attractive approach to prevent Postoperative ileus in the postoperative period (Nisa Prueksaritanond et al., 2023). Thus, this study is important as most patients undergoing abdominal surgery experience impaired digestive function post-surgery which can affect their quality of life. This study is also relevant to the increasing number of abdominal surgeries performed every year worldwide. By using a combination of chewing gum and acupressure at ST 36 point, this study can explore the effectiveness of non-pharmacological therapy in accelerating the recovery of digestive function of postoperative patients. This objective aims to identify and evaluate the effectiveness of non-pharmacological therapy in accelerating the recovery of digestive function of patients after abdominal surgery.

METHOD

A systematic review was conducted using 5 electronic databases, namely Pubmed, Science Direct, Proquest, Taylor and Francis, and Scopus. The search was conducted on February 20, 2024. These keywords were applied using Boolean Logic (and, or) in the article search. The combination of keywords and MeSH terms developed was then adapted to “Chewing Gum” AND “Acupuncture” OR “Acupuncture Points” OR “ST 36 Point” AND “Non-pharmacological Therapy” AND “Postoperative Period” AND “Abdominal Surgery” AND

“Digestive” AND “System” AND “Function” AND “Recovery” published from 2019 to 2024 in English.

The population, intervention/issue of interest, comparison, outcome, and study design (PICOS) method were applied to identify eligible studies. The inclusion criteria were Randomized control trial and Quasi-experimental designs, only articles published in English up to February 2024, studies focused on patients diagnosed after abdominal surgery, and studies including chewing gum or acupressure as an intervention or exposure. The exclusion criteria were unavailable full-text articles, not RCT and Quasi-experimental design, and studies that do not focus on abdominal surgery or do not include chewing gum or acupressure. Based on the results of the article search, 1.098 articles were obtained from keyword adjustments with details on the Pubmed database (n = 489), Science direct (n = 220), Proquest (n=178), Taylor and Francis (n=123) and Scopus (n = 88), and of the 1.098 articles found, a check or check for duplication of articles was carried out and 426 of the same articles were found so that they were removed and the remaining 663 articles. Reviewers then filtered based on the title in accordance with the theme obtained 479 articles that did not match, so that the appropriate results were obtained as many as 184 articles. The reviewer then screened based on the abstract, 109 articles were found to be inappropriate so that the remaining 75 articles were appropriate. The next reviewer conducted eligibility screening based on the inclusion criteria and exclusion criteria that had been set, so 17 articles were found that could be used in this review. The results of this review journal selection can be reflected in PRISMA.

RESULTS

Post abdominal surgery, patients often experience a variety of digestive problems that can affect their recovery process. In an effort to speed up recovery and improve digestive function, various non-pharmacological interventions have been explored, including the use of chewing gum and acupressure. This study aims to evaluate the effectiveness of both methods in improving digestive function after surgery. By conducting a scoping review, this study will identify and analyze existing evidence regarding the impact of chewing gum and acupressure on digestive recovery, as well as provide greater insight into the mechanisms underlying these interventions. Through a better understanding of the potential benefits of these methods, it is hoped that stronger recommendations for clinical practice in supporting postoperative patients can be derived. Study characteristics across the selected articles included a focus on randomized controlled trials (RCTs) investigating the effects of chewing gum and acupressure in patients with post abdominal surgery. These studies collectively aimed to assess the efficacy of chewing gum and acupressure in improving digestive function in individuals with post abdominal surgery, using rigorous randomized controlled trial and quasi experimental study to ensure the reliability of their findings.

Table 1.

Result of Study

Title and Author	Objective	Method	Results
<i>Chewing Gum for Prevention of Nausea and Vomiting After Elective Caesarean Section: a Pilot Randomised Controlled Trial</i> (Bowe et al.,	The aim of this study was to investigate the effectiveness of chewing gum in reducing postoperative nausea and	D: RCT without blinded S: 295 patient post sectio caesarea Vi: Chewing gum intervention Vd: Incidence of postoperative nausea and vomiting in patients undergoing sectio caesarea I: The intervention in this study was the administration of mint-flavored sugar-free gum (Wrigley's Extra Sugarfree, peppermint) to	Chewing gum did not significantly reduce the incidence of postoperative nausea and vomiting (PONV) in the 24 hours after cesarean section under spinal anesthesia. Although the intervention was well received and caused no complications, there were no significant differences in nausea levels, antiemetic use, or patient satisfaction between the gum-chewing

Title and Author	Objective	Method	Results
2022)	vomiting in patients undergoing cesarean section.	participants. The gum was chewed at their convenience for 24 hours after surgery. A: Shapiro–Wilk, Pearson’s chi-squared test, independent t-test or Mann–Whitney U test.	group and the standard therapy group.
<i>Effect of chewing gum on bowel recovery following caesarean section: a randomized controlled trial</i> (Gayathri et al., 2020)	The aim of this study was to assess the effectiveness of chewing gum on bowel recovery after sectio caesarea.	D: RCT S: 170 patient post sectio caesarea Vi: Chewing gum intervention Vd: Recovery of bowel function after caesarean section, as measured by time to first hunger, time to first bowel movement, and time to first bowel movement I: Group A (gum chewing group) received standard chewing gum (ORBIT) 6 hours after surgery, three times a day until passing wind, and group B (control group) received standard postoperative care. A: Unpaired t test, Chi-square test	Chewing gum significantly improved bowel motility in patients after caesarean section, which was characterized by faster time to pass gas and defecate. Patients who chewed gum were also discharged from hospital one day earlier compared to the group that received standard care. No adverse events were reported related to the use of chewing gum.
<i>Impact of gum chewing on recovery of bowel activity after caesarean section</i> (Manisha & Duhan, 2020)	The aim of this study was to evaluate the impact of chewing gum on the recovery of bowel activity after sectio caesarea.	D: RCT S: 220 patient post sectio caesarea Vi: Chewing gum intervention Vd: Recovery of bowel activity after caesarean section, as measured by flatus discharge time and bowel movements. I: Administration of chewing gum to the study group after sectio caesarea A: Chi-square test and Student t-test	Chewing gum after caesarean section accelerates the recovery of bowel activity. This is shown by the earlier appearance of bowel sounds, flatus discharge, and bowel movements, as well as a shorter hospitalization period. Chewing gum was also associated with fewer abdominal complications. The study concluded that chewing gum is an effective and inexpensive method to speed up the recovery of bowel motility after caesarean section.
<i>Role of Chewing Gum in Enhancing Post-Operative Recovery Of Bowel Function after Lower Segment Cesarean Section</i> (Azhar et al., 2024)	The aim of this study was to evaluate the effectiveness of chewing gum in improving gastrointestinal recovery in patients after sectio caesarea..	D: Cross-sectional comparative analytical study S: 200 patient post sectio caesarea Vi: Chewing gum intervention Vd: Gastrointestinal function recovery time, as measured by time to first bowel sound, time to first bowel movement, and time to first bowel movement after sectio caesarea. I: The intervention in this study was the administration of chewing gum to group A three hours after surgery for 30 minutes, which was repeated every three hours for a total of three sessions. Group B did not receive this intervention and served as the control group. A: Independent samples t-test	Chewing gum significantly accelerated the recovery time of gastrointestinal function in patients after caesarean section. Patients who received chewing gum post-surgery experienced faster time to first bowel sound, first bowel movement, and first bowel movement compared to patients who did not receive chewing gum.
<i>Effect of Xiangbin Prescription in Gastrointestinal Function After</i>	The aim of this study was to compare the effectiveness of Xiangbin	D: RCT S: 190 patient post gynecological surgery Vi: Xiangbin recipe (XBP) and chewing gum	The results showed that XBP significantly accelerated the time to first flatus and defecation compared to the control group. In addition, XBP also increased Ghrelin hormone

Title and Author	Objective	Method	Results
<i>Gynecological Abdominal Surgery: a Randomized Controlled Trial</i> (Wu et al., 2021)	prescription (XBP) and chewing gum in promoting the recovery of gastrointestinal function after gynecological surgery.	Vd: Recovery of gastrointestinal function after gynecologic surgery. I: XBP group receives conventional therapy plus XBP taken twice daily, chewing gum group was given sugarless mint gum, chewed every 4 hours while awake after surgery, the blank group received only basic therapy without any other additional interventions A: Pearson's Chi-square or Fisher's exact tests, ANOVA or Kruskal-wallis test to	(GHRL) levels associated with gastrointestinal function and reduced the incidence of postoperative complications. Overall, this study concludes that XBP is more effective in accelerating the recovery of gastrointestinal function and reducing postoperative complications compared to chewing gum and blank control.
<i>Evaluation of postoperative gum chewing role in stimulating bowel motility in colonic surgery</i> (AL-Harbawia & Hasan, 2018)	The aim of this study was to evaluate the effect of chewing gum on postoperative ileus after colon surgery.	D: RCT S: 90 patient post colonic surgery Vi: Chewing gum intervention Vd: Time to first flatus, Time to first hunger, Time to first bowel movement, Duration of hospital stay after surgery I: The intervention in this study was chewing gum after colon surgery, which was randomly divided into two groups: the chewing gum group (44 patients) and the non-chewing gum group (46 patients). A: Student-t test	Chewing gum after colon surgery can significantly reduce the time to first bowel movement, time to first flatus, and time to first hunger compared to those who do not chew gum. Nonetheless, chewing gum may not have a significant impact on the duration of postoperative hospital stay. Chewing gum was found to be a cost-effective and well-tolerated treatment for postoperative ileus.
<i>Effects of Gum Chewing on Recovery From Postoperative Ileus: A Randomized Clinical Trial</i> (Hsu & Szu, 2022)	The aim of this study was to evaluate the effectiveness of chewing gum in restoring normal bowel movements in patients with colorectal cancer who had undergone abdominal surgery for colonic resection.	D: RCT S: 60 patient post operative ileus Vi: Chewing gum intervention Vd: Time to first flatus and time to first defecation. I: The intervention in this study was chewing gum. The study subjects allocated to chewing gum totaled 30 people. A: Independent t test, Mann-Whitney U test, ANCOVA, Spearman's rank correlation, Chi-square tests.	Chewing gum significantly reduced the time to first flatus and first defecation in patients undergoing colorectal resection. This intervention also has the potential to reduce hospital length of stay. Chewing gum is a safe, inexpensive and non-invasive intervention that may improve recovery from postoperative ileus in patients undergoing colorectal surgery.
<i>The Effect of Chewing Sugar-Free Gum to Improve Bowel Movement After Colorectal Surgeries in Patients With Colorectal Cancer</i> (Al-kharabsheh et al., 2023)	The aim of this study was to assess the effectiveness of chewing sugar-free gum in reducing postoperative ileus in patients with colorectal cancer after surgery.	D: RCT S: 129 Colorectal Surgeries in Patients With Colorectal Cancer Vi: Chewing gum intervention Vd: Time of first pass flatus after surgery. I: The intervention in this study involved patients in the experimental group who were asked to chew sugar-free gum starting 6 hours after surgery. They were asked to chew the gum for 1 hour, every 8 hours a day, until the first bowel movement occurred. A: One-way ANOVA, and t-test.	Chewing sugar-free gum after colorectal surgery significantly accelerates the recovery of bowel function by speeding up the time to first bowel movement, reducing the length of hospital stay and decreasing complications. Chewing gum is considered a safe, inexpensive and practical method to reduce postoperative ileus in patients with colorectal cancer. The study also found that younger patients and males benefited more from chewing gum.

Title and Author	Objective	Method	Results
<i>The impact of chewing gum on postoperative bowel activity and postoperative pain after total laparoscopic hysterectomy</i> (Turkay et al., 2020)	The aim of this study was to investigate the effects of chewing gum on bowel activity and postoperative pain in patients undergoing laparoscopic hysterectomy.	D: RCT S: 109 patient post total laparoscopic hysterectomy Vi: Chewing gum intervention Vd: Bowel activity and postoperative pain. I: The intervention in this study was gum chewing. Patients in the study group (gum-chewing group) were asked to chew gum after laparoscopic total hysterectomy surgery. A: Shapiro–Wilk test, Mann–Whitney U test, paired t-test, Pearson’s Chi-square and Fisher–Freeman–Halton exact tests	Chewing gum after laparoscopic total hysterectomy surgery has a positive effect on bowel motility and postoperative pain. Chewing gum significantly reduced the time taken for the first bowel movement, first gas escape and first defecation. In addition, chewing gum also reduced the amount of postoperative analgesics required and postoperative pain scores. The intervention was well received by patients and resulted in a high level of satisfaction. Therefore, this study recommends postoperative gum chewing to patients undergoing total laparoscopic hysterectomy.
<i>Association of gum chewing with early gastrointestinal recovery in single-port laparoscopic gynecologic surgery</i> (Yin et al., 2023)	The aim of this study was to investigate the impact of chewing gum on gastrointestinal recovery after single-port laparoscopic gynecologic surgery.	D: RCT S: 106 patient single-port laparoscopic gynecologic surgery Vi: Chewing gum intervention Vd: Gastrointestinal recovery after single-port laparoscopic gynecologic surgery, as measured by mean time to first flatus I: Group A (Gum Chewing Group) received postoperative care along with gum chewing. Group B (Control Group) received only routine postoperative care without gum chewing. A: Chi-square test or Fisher Precision Probability test, normally distributed continuous variables were assessed using Student’s t test, and the Mann-Whitney U test	Chewing gum after laparoscopic gynecologic surgery with one port can accelerate the recovery of gastrointestinal function and speed up the time to first flatus discharge compared with the control group. No adverse effects were reported, suggesting that chewing gum is a safe and well-tolerated intervention for postoperative care in these patients.
<i>The ST-36 Acupressure Increased Gut Motility To Sectio Caesarea Patients with Subarachnoid Block Anesthesia</i> (Bakar et al., 2019)	The purpose of this study was to analyze the effect of ST-36 acupressure on intestinal motility and flatus time in postoperative patients with Subarachnoid Block anesthesia.	D: Quasi-Experiment S: 28 postoperative patients with Subarachnoid Block anesthesia. Vi: ST-36 acupressure given by researchers to patients according to the module Vd: Bowel motility and flatus time. I: The intervention in this study involved the administration of acupressure at the ST-36 point by the researcher to the patient according to the module. The parameters of the ST-36 acupressure module include massage performed on the ST-36 meridian point. A: Independent t test	ST-36 acupressure can improve bowel motility in postoperative patients with Subarachnoid Block anesthesia, but has no significant effect on flatus time. This study suggests that acupressure may be an effective non-invasive therapy to improve bowel motility in postoperative patients. However, for optimal results, this therapy may need to be combined with mobilization.
<i>Effect of acupressure on bowel function recovery after cesarean section: a randomized</i>	The aim of this study was to evaluate the effect of acupressure on the recovery	D: RCT S: 48 patient post sectio caesarea Vi: Acupressure intervention applied to the intervention group Vd: Time to recovery of bowel function, as measured by time to	Acupressure at point ST-36 significantly accelerated the recovery of bowel function in women after cesarean section. Acupressure reduced the time to first bowel movement, first bowel sound, and first bowel

Title and Author	Objective	Method	Results
<i>controlled trial</i> (Prueksaritanond et al., 2023)	of bowel function in women after undergoing cesarean section.	first bowel sound, time to first bowel movement, and time to first bowel movement. I: The intervention in this study was acupressure applied to the intervention group. After cesarean section (CS), the assigned intervention was disclosed and implemented by the nursing staff in charge of the postpartum service ward. The researcher who performed acupressure on all participants was trained and licensed in Traditional Chinese Medicine, ensuring accurate location of the ST-36 acupressure points. A: Chi-square or Fisher's exact test, The Mann-Whitney U.	movement compared to the control group. In addition, acupressure also reduced the incidence of mild nausea/vomiting without causing side effects. Although there was no difference in the length of hospital stay between the two groups, acupressure may be a safe and effective method to accelerate the recovery of bowel function after cesarean section.
<i>The Effect of Xylitol Gum Chewing After Cesarean on Bowel Functions: A Randomized Controlled Study</i> (Elkan Kiyat & Kahyaoglu Sut, 2022)	The aim of this study was to explore the effects of chewing xylitol gum after cesarean section on bowel function.	D: RCT S: 69 patient post sectio caesarea Vi: Types of chewed gum, i.e. xylitol gum, nonxylitol gum Vd: Bowel function after cesarean section, as measured by parameters such as the first time bowel sounds are heard, first time to pass gas, first time to defecate, first time to feel hungry, and length of hospital stay. I: The intervention in this study involved three different groups: a xylitol gum chewing group, a nonxylitol gum chewing group, and a control group. Each group consisted of 23 women who were randomly selected using computer-generated randomization. A: ANOVA	Chewing xylitol gum after cesarean section can speed up bowel function. Women who chewed xylitol gum experienced earlier onset of flatulence and defecation and a shorter hospital stay compared to the control group. This suggests that chewing xylitol gum after cesarean section may be an effective method to promote bowel function.
<i>Efficacy of chewing gum for improving bowel function after cesarean sections: a randomized controlled trial</i> (Yenigul et al., 2020)	The aim of this study was to investigate the effect of chewing gum on bowel function after cesarean section.	D: RCT S: 150 patient post sectio caesarea Vi: Types of chewed gum Vd: Post sectio caesarea bowel function, as measured by parameters such as the time at which bowel peristalsis is first heard, the time at which bowel movements are first heard, the time at which hunger is first felt, and the time at which bowel movements are first experienced. I: Chewing gum (CG) after cesarean section. Patients in the CG group received gum at 3, 5, and 7 hours postoperatively and chewed it for 30 minutes. Consisting of 2 groups, using chewing gum and standard intervention. A: Kolmogorov-Smirnov test,	Chewing gum (CG) after cesarean section can accelerate the return of bowel function. Patients who chewed gum at 3, 5, and 7 hours postoperatively experienced earlier bowel movements, bowel movements, and hunger pangs compared to the control group. In addition, hospital length of stay was shorter and overall satisfaction with bowel function was higher in the gum-chewing group.

Title and Author	Objective	Method	Results
<i>Effect of acupuncture on postoperative ileus after laparoscopic elective colorectal surgery: A prospective, randomised, controlled trial</i> (Yang et al., 2022)	The aim of this study was to investigate the effect of electroacupuncture (EA) at different acupuncture points on postoperative ileus (POI) in patients undergoing colorectal cancer surgery.	Independent samples t-test or Mann–Whitney U-test, Chi-square and Fisher’s exact tests D: RCT S: 105 patient postoperative ileus Vi: EA at ST36 with standard treatment, EA at ST25 with standard treatment, or standard treatment only Vd: Time to first flatus, time to first defecation, time to tolerance of liquid diet, time to tolerance of semi-liquid diet. I: The EA group at ST36 with standard care, received one electroacupuncture (EA) session per day at the ST36 acupuncture point, The EA group at ST25 with standard care received one EA session per day at the ST25 acupuncture point, The standard care only group received the same postoperative management without EA. A: Bonferroni correction	Acupuncture point ST36 significantly improved the recovery of bowel function in colorectal cancer postoperative patients compared to standard care alone. Patients who received EA at ST36 showed faster time to first flatus and first defecation compared to the standard care group. In addition, patients in the EA group at ST36 also tolerated liquid food faster compared to the standard care group.
<i>Effects of acupressure, gum chewing and coffee consumption on the gastrointestinal system after caesarean section under spinal anaesthesia</i> (Kanza Gül & Şolt Kırcı, 2021)	The aim of this study was to compare the effects of acupressure, chewing gum, coffee consumption, and a control group on gastrointestinal motility after cesarean section.	D: Quasi Experimental S: 160 patient post sectio caesarea Vi: Acupressure, chewing gum, coffee consumption, and control group Vd: Gastrointestinal motility after cesarean section, as measured by time to first gas and defecation I: The acupressure group used acupressure point ST36 for 10 minutes, the chewing gum group chewed sugar-free gum four times a day for 15 minutes, the coffee consumption group, and the control group did not receive any special intervention. A: Kruskal–Wallis test	Acupressure applied to acupuncture point ST36 accelerated the onset of flatulence and defecation earlier compared to the gum-chewing group, as well as the coffee and control groups. This difference was statistically significant. Acupressure was found to be a cost-effective and non-invasive method to improve postoperative gastrointestinal motility.
<i>Effect of Chewing Gum on Gastrointestinal Function Recovery After Surgery of Gynecological Cancer Patients at Rajavithi Hospital: A Randomized Controlled Trial</i> (Nanthiphatthana chai & Insin, 2020)	The aim of this study was to investigate the effect of chewing gum on the recovery of gastrointestinal function in patients undergoing gynecologic cancer surgery.	D: RCT S: 82 patient post Surgery of Gynecological Cancer Vi: Chewing gum Vd: Recovery of gastrointestinal function, as measured by time to first bowel movement, time to first bowel sound, time to first bowel movement, and time to first walk. I: Interventionists began chewing gum on the first morning after surgery under the supervision of nursing staff. Each chewing session lasted 30 minutes and was continued every 8 hours while the patient was awake. A: Student’s t-test, Mann-Whitney	Chewing gum significantly accelerates the recovery of gastrointestinal function, which is characterized by shorter time to first bowel movement and shorter duration of hospitalization. Chewing gum was found to be safe, effective and more cost-effective compared to pharmacological management to prevent postoperative ileus.

Title and Author	Objective	Method	Results
		U test, Pearson's chi-square test or Fisher's exact test and, Kaplan-Meier methods and log-rank test	
<i>Gum chewing and bowel function after Cesarean section under spinal anesthesia</i> (Akalpler & Okumus, 2018)	Examine the effects of chewing gum on bowel function in women after cesarean section under spinal anesthesia.	D: Quasi Experimental S: 90 patient post sectio caesarea Vi: Chewing gum Vd: Bowel function, as measured by time to first flatulence, time to first bowel sound, and time to discharge. I: Subjects in the experimental group were asked to chew gum after cesarean section under spinal anesthesia. A: Pearson's Chi Square and Fisher's exact	Chewing gum after cesarean section under spinal anesthesia may improve bowel function. Women in the gum-chewing group experienced flatulence earlier (13.44 hours on average) compared to the control group (26.33 hours). In addition, the time to first hearing bowel sounds was also faster in the gum-chewing group (12.62 hours) compared to the control group (16.35 hours).

DISCUSSION

Interventional procedures to accelerate the recovery of digestive function after abdominal surgery involve two non-pharmacological methods, namely chewing gum and acupressure. Based on a systematic review, the gum chewing intervention is started around 6 hours postoperatively, where patients are instructed to chew gum for 30 minutes every 3 hours, with a total of three sessions in one day. In some cases, chewing gum is only used 24 hours after surgery. Acupressure has been found to be effective in accelerating the recovery of bowel function after abdominal surgery. Studies have shown that acupressure can be performed starting from 2 hours after surgery, with the duration lasting for 24 hours. Acupressure is usually performed regularly, such as every 4 hours, to maximize its effect. In some cases, acupressure has been used for 3 days after surgery to ensure optimal bowel recovery. Meanwhile, acupressure, specifically at ST point 36, was also applied as an additional intervention to stimulate gastrointestinal function. Research shows that these two interventions can improve intestinal motility, speed up the time to gas and bowel movements, and reduce the length of hospitalization of patients after surgery. An analysis of 18 relevant articles showed that a combination of these two methods can provide better results in postoperative recovery compared to standard care.

Acupressure and chewing gum have been found to be effective in stimulating bowel motility after abdominal surgery. Acupressure works by activating the vagus and parasympathetic pathways, triggering the release of acetylcholine and reducing the inflammatory response in the gastrointestinal system. This can help speed up the return of bowel function and reduce hospital stay time. Meanwhile, chewing gum can stimulate the vagal-cerebral reflex, increasing gastrointestinal hormones such as gastrin, secretin and enteroglucagon, which play a role in the regulation of movement and secretion of the digestive system. Both methods have been shown to speed up the return of bowel function, particularly by improving the time to first bowel sounds, the time to first gas, and the time to first stool. After undergoing abdominal surgery, many patients experience a significant slowdown in digestive function. This is due to several factors, including post-operative pain that inhibits patient mobility and reduces nutritional intake. Pain in the surgical area can interfere with gastrointestinal movements, which contributes to decreased intestinal motility and slows down the recovery process. A common complication is difficulty in passing gas and bowel movements, which can lead to abdominal distension and prolong hospitalization time. Research shows that approximately 10% to 30% of post-abdominal surgery patients experience abdominal distension and delayed return of bowel function, which can affect their quality of life. In

addition, changes in the autonomic nervous system also play a role in decreasing gastrointestinal motility for several days after surgery, thus slowing down overall recovery.

Findings from various studies show that chewing gum has a significant positive effect on intestinal motility and peristalsis after abdominal surgery. Research shows that this intervention can stimulate gastrointestinal function by increasing the frequency and strength of intestinal peristalsis. For example, in one study (Kanza Gül & Şolt Kirca, 2021), patients who chewed gum after cesarean section experienced faster times to passing gas and bowel movements, as well as reduced length of hospital stay. Moreover, the mechanism behind this effect is related to the activation of the cephalic-fecal reflex that increases the secretion of gastrointestinal hormones such as gastrin and cholecystokinin, which play a role in stimulating intestinal motility. Other studies have also noted that patients who chew gum show a significant improvement in bowel sounds and digestive function recovery time, making it an effective non-pharmacological method to speed up post-surgery recovery. In several of the studies reviewed, patients who chewed gum starting six hours after surgery experienced faster flatus expulsion compared to a control group that did not receive the intervention. For example, one study (Hsu & Szu, 2022) noted that patients who chewed gum experienced a shorter first flatus time, averaging around 24 hours post-surgery, compared to a group that only received standard care which could take up to 48 hours. The mechanism behind this effect is related to the stimulation of the cephalic-fecal reflex which increases the secretion of gastrointestinal hormones, thereby promoting intestinal motility and speeding up the recovery of digestive function.

In cesarean procedures under spinal anesthesia, a comparison between using chewing gum and acupressure has been made to accelerate the recovery of gastrointestinal function. Studies have shown that acupressure can accelerate the time to first flatulation and defecation compared to controls, and can delay the use of postoperative analgesics. On the other hand, chewing gum has also been shown to be effective in accelerating the time to first flatulation and defecation, and reducing gastrointestinal recovery time (Akalpler & Okumus, 2018). However, it should be noted that the effectiveness of chewing gum is more limited under spinal anesthesia compared to general anesthesia, as general anesthesia may affect more aspects postoperatively. Therefore, acupressure may be considered as a more effective and safe alternative to accelerate patient recovery after cesarean under spinal anesthesia. This study concludes that chewing gum has a positive effect on reducing postoperative ileus and improving intestinal motility in patients after abdominal surgery. The results show a significant improvement in bowel function among those who chewed gum compared to those who did not, with a p-value of 0.000, indicating strong statistical support for the findings. It is recommended that nurses incorporate chewing gum as an independent nursing intervention. This practice should be standardized as part of operational procedures to manage bowel peristalsis in postoperative patients. The ease and cost-effectiveness of this intervention make it a practical option for enhancing recovery protocols (Basri & Sulistiyawati, 2018).

The study highlights that chewing gum functions as a form of sham feeding, stimulating the vagal nervous system and promoting the release of gastrointestinal hormones. This physiological response is crucial for enhancing the digestive process and accelerating recovery from ileus. These findings support broader guidelines from the Enhanced Recovery After Surgery (ERAS) protocol, which advocates for non-pharmacological interventions to improve recovery outcomes. Chewing gum emerges as a simple yet effective method for boosting gastrointestinal motility and reducing complications associated with postoperative ileus (Rohmani & Borneo, 2022). The research emphasizes that chewing gum is a simple, safe,

and cost-effective intervention that can aid in the recovery of digestive function. This aligns with the goal of promoting easily implementable strategies to enhance patient recovery. Chewing gum has been shown to improve gastrointestinal peristaltic movements, which are crucial for digestive health. The act of chewing stimulates various physiological responses, including increased blood flow and oxygen supply to the brain, which may help reduce stress and muscle tension in patients (Rohmani et al., 2023).

The results of a study on the effects of acupressure at point ST 36 showed a significant positive impact on intestinal motility and peristalsis after abdominal surgery. Acupressure at this point serves to stimulate the vagus nerve pathway and increase parasympathetic activity, which contributes to increased secretion of gastrointestinal hormones and stimulation of peristalsis. In several studies, (Bakar et al., 2019) patients who received acupressure at point ST 36 showed faster recovery time in terms of gas output and bowel movements compared to the control group who did not receive the intervention. In addition, acupressure was shown to reduce symptoms of abdominal distension and improve postoperative patient comfort. The study also noted that acupressure can reduce inflammation in the gastrointestinal system, thus speeding up the recovery process of digestive function.

CONCLUSION

Research results show that chewing gum can stimulate gastrointestinal motility by increasing the secretion of important gastrointestinal hormones. Several studies analyzed showed that patients who chewed gum after surgery experienced faster recovery of digestive function, including shorter times to gas and bowel movements, as well as a reduction in the length of hospital stay. Acupressure was also identified as an effective method in addressing post-surgery digestive issues by utilizing specific nerve pathways to stimulate gastrointestinal function. Overall, the study concluded that the combination of chewing gum and acupressure may be a promising approach to improve digestive recovery after abdominal surgery, which may contribute to better clinical practice in post-surgical patient care

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