International Journal Of Health Science Vol 3 No. 1 (MARET 2023) Hal 141-150
E-ISSN : 2827-9603 P-ISSN : 2827-959X

INTERNATIONAL JOURNAL OF HEALTH SCIENCE
Link Page: https://ejurnal.politeknikpratama.ac.id/index.php/ijhs
Page: https://ejurnal.politeknikpratama.ac.id/index.php

CHEWING GUM CAN OVERCAOME POST OPERATIVE ILEUS ON ABDOMINAL SURGERY PATIENTS : CASE STUDY JAYAPURA GENERAL HOSPITAL PAPUA"

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ABSTRACT

Background: Postoperative ileus is a major and transient problem in patients undergoing abdominal operative. Postoperative ileus commonly occurs at 25% of patients undergoing abdominal surgery. Signs symptoms of postoperative ileus include abdominal distension, nausea, vomiting, inability to the oral diet both eating and drinking, absence of flatus, and changes in defecation (gastrointestinal motility). Due to the presence of ileus patients are at high risk of developing complications, expensive treatment costs, lengthy stay, and late oral administration to the diet According to guidelines for post-surgery in digestion as well as gynecology in guidline enhanced recovery after surgery community recommends the use of chewing gum (shame feeding) to prevented post-operative ileus or ileus post-surgery.
So there are several types of interventions to reduce postoperative ileus, namely implementing chewing gum as an evidence-based practice aimed at improving intestinal motility and minimizing side effects of postoperative ileus. Chewing gum is inexpensive, easily available, and a non-pharmacological intervention capable of producing changes in gastrointestinal motility and rapidly reducing the ileus post-operative. Furthermore, chewing gum interventions are relatively easy for nurses to implement. Research purpose: Effect of chewing gum on postoperative ileus prevention in postoperative abdominal patients. Research Methods: This type of research is quantitative research with a pre- and post-control quasi-experimental approach with a total of 30 respondent. Sampling using the accidental sampling method because respondent in hospital Jayapura city for abdominal surgery are still limited. The examinations used were the Wilcoxon and Man Whitney tests. Results: For the univariate analysis, it was found that male respondents were 20 respondents (66.7%) and women were 10 respondents (33.3). The age of the most respondents was 16 - 35 years old as many as 19 respondents (63.3%) and the least between 56 - 75 years old as many as 2 respondents (6.7%). Wilcoxon test results obtained p-value of 0.001 < 0.005 its mean that there is The chewing gum on improved intestinal motility of patients after abdominal operative. summary: chewing gum on the decline of ileus postoperative.
Keywords: Chewing gum, ileus post-operative, gastrointestinal motility, abdominal surgery.

Introduction

Post-operative ileus, POI, is the primary and temporal problem in patients with first abdominal surgery 1. Post-operative ileus occurs for a percentage of 25% of patients with abdominal surgery. The symptoms of post-operative ileus include abdominal distention, sickness, vomiting, oral dietary incapability for both eating and drinking, flatus absence, and defecation

Received Desember. 30, 2022; Revised Januari. 12, 2023; Accepted Februari.21, 2023

change (gastrointestinal motility) 2. The presence of ileus puts the patients at high risk of complications, expensive care, longer inpatient periods, and late oral dietary administration 3. Colorectal cancer, gastric cancer, pancreas cancer, and duodenal cancer must receive immediate care from a digestive surgeon with the open laparotomy procedure. On the other hand, cholelithiasis disease must receive laparoscopic care.

4. Normally, during the post-surgery operation, the gastrointestinal sounds will fade at the fourth quadrant. The duodenum inspection determines the possible abdominal distention occurrence due to the gas accumulation. Clients with abdominal surgery suffer from distention due to internal bleeding. Post-operative ileus, IPO, refers to a primary stress response of abdominal surgery. The indications and symptoms include abdominal pain, nauseous, vomiting, abdominal distention, delayed stool pass, and incapability of getting adequate food and beverages. Post-operative ileus is defined as the onset surgical time until the flatus passage or defecation and the time to maintain the oral intake adequately for the first twenty-four hours 5.

Based on the guideline of post-operative in digesting and gynecology, specifically the Enhanced Recovery after Survey (ERAS), the recommendation includes using chewing gum in preventing post-operative ileus 6. Some interventions to reduce post-operative ileum include chewing gum as an evidence-based practice to improve ileus motility and minimize the side effects of postoperative ileus. Chewing gums are inexpensive, affordable, and applicable for non-pharmacological practices with significant effects on gastrointestinal motility.

The gums could also relieve the effects of postoperative ileus. Then, the chewing gum intervention is relatively easy to apply the care 1. The recovery process of gastrointestinal function is indicated by gastrointestinal motion, flatus passage, defecation, and hunger. The emergence of the first flatus passage is the indication of digesting system function 4.

The patients receive physiological influence by eating without enjoying the real meals. Chewing gum could activate the vagus nerve. This matter shows the improved production of the stomach acid, pepsin, and polypeptides of the pancreas that facilitate gastrointestinal motility 7. The cephalon vagal reflex directly stimulates and leads to gastrointestinal motility.

With indirect stimulus, the gastrointestinal hormone secrets saliva, gastric hormone, and pancreas gland. Chewing gum therapy is effective to stimulate gastric secretion at the cephalic stage 3.

From the data and the explanation, the researchers attempted to promote simple, safe, easy, cheap, and useful interventions to recover gastrointestinal function.

Method

This quasi-experiment research applied a non-equivalent group with a pretest-posttest design to examine the applied intervention, chewing gum, for the intervention group without applying any subject randomization for intervention and control groups (Dharma, 2011; Nancy & Grove, 2003). The sample consisted of 30 respondents. Fifteen respondents joined the intervention group while the remaining respondents were in the control group. The applied sampling was random sampling with consecutive sampling. This sampling method allowed the researchers to select the individuals based on the applied criteria.

Research Results

1. The Univariate Analysis

a. Ages of the Respondents

Table 1. The Frequency Distributions based on the Ages of Respondents at Pulmonary Care of Jayapura Hospital (n=30)

Age	Group				Total	
	Intervention		Control			
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
16 – 35 years old	9	60	10	66,7	19	63,3
36 – 55 years old	5	33,3	4	26,7	9	30
56 – 75 years old	1	6,7	1	6,7	2	6,7
	15	100	15	100	30	100

(Primary data source, 2022)

Table 1. shows most respondents of both groups are aged between 16 and 35 years old, nineteen respondents or 63.3%. Nine individuals, 60%, are from the intervention group and 10 respondents or 66.7% are from the control group. On the other hand, the lowest frequency of respondent age is 56 - 75 years old, consisting of only 2 respondents or 6.7%. A

respondent, 6.7%, is from the intervention group while another respondent is from the control group.

b. Sex Types of the Respondents

Table 2. The Frequency Distribution based on the Sex Types of the Respondents at Pulmonary Care of Jayapura Hospital (n=30)

Sex Types	Group				Total	
	Intervention		Control			
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Male	11	73,3	9	60	20	66,7
Female	4	36,7	6	40	10	33,7
	15	100	15	100	30	100

(Primary data source, 2022)

Table 2. shows that most respondents are male, 20 respondents or 66.7%. Eleven respondents, 73.3%, are from the intervention group while 9 respondents, 60%, are from the control group. From the table, only 10 respondents are female, 33.7%. Four respondents, 36.7%, are from the intervention group while 6 respondents, 40%, are from the control group.

2. The Bivariate Analysis

The researchers applied the Wilcoxon test to examine the mean differences between the groups, before and after applying the chewing gum intervention. Here are the analyses results.

Table 3. the Difference of Respondents' Gastrointestinal Motilities before and after the Treatment for both Groups at Jayapura Hospital 2022 (n: 30)

The Intervention Group	Mean	Min	Max	n	*p-value*
Pre-gastrointestinal motility	2,60	1	4	15	0,001
Post-gastrointestinal motility	8.73	7	10	15	
Control Group	**Mean**	**Min**	**Max**	**n**	***p-value***
Pre-gastrointestinal motility	2,67	2	6	15	0,000
Post-gastrointestinal motility	4,87	3	6	15	

(Primary data source, 2022)

Table 3. shows the mean gastrointestinal motility for the intervention group before the treatment, chewing gum is 2.60 with the lowest motility of 1 and the highest motility of 4. After applying the treatment, the mean of the group's gastrointestinal motility is 8.73 with the lowest motility at 7 and the highest motility at 10. The analysis with the non-parametric test, the Wilcoxon test, shows the different increased improvement of gastrointestinal motility before and after the treatment, chewing gum therapy significantly (*p-value* = 0,0001).

The analysis result on the control group before the treatment is 2.67 with the lowest motility of 1 and the highest motility of 6. For the intervention group, after the standard implementation, the lowest value is 3 while the highest value is 6.
The analysis with the non-parametric test, the Wilcoxon test, shows the different increased improvement of gastrointestinal motility between before and after the treatment, chewing gum therapy significantly (*p-value* = 0,0000).

Table 4. The Pain Scale Differences of the Respondents after the Treatment between both Groups at Jayapura Hospital on April 2022 (n=30)

Variables	Mean	Min	Max	n	*p-value*
Gastrointestinal motility of the post-intervention group	8,73	7	10	15	0,000
Gastrointestinal motility of post-control group	4,87	3	6	15	

(Primary data source, 2022)

The analysis results showed that the intervention group, after the abdominal surgery, suffered from gastrointestinal motility of 8.73 with the lowest value of 7 and the highest value of 10. For the control group, the patients experienced increased gastrointestinal motility, 4.87 with the lowest of 3 and the highest of 6. The non-parametric test analysis with the Mann-Whitney test found the increased gastrointestinal motility difference between the groups with a p-value of 0.0000.

A. Discussion

1. The Bivariate Analysis

a. The Gastrointestinal Motility of Intervention Group with the Post-Abdominal Surgery after and before the Implementation of Chewing Gum Therapy at Jayapura Hospital

The analysis with the non-parametric test, the Wilcoxon test, shows the different increased improvement of gastrointestinal motility before and after the treatment, chewing gum therapy significantly (*p-value* = 0,0001).

Basri (2018) also found that chewing gum therapy, 3 days for 30 minutes each day, influenced the post-appendectomy peristaltic movement with a p-value of 0.0000.

Chewing gum is useful as a sham feeding to influence the vagal nervous system and is useful to secret the gastrointestinal hormone. The therapy could also improve the salivary secretion and pancreatic juice, gastric, and neurotensin to influence gastrointestinal motility, duodenum, and rectum in the human stomach (Ledari FM, 2013). Martha (2012) explains that chewing gum could lose weight and improve the digestive system. The effective intervention for a post-operative patient is - activating the cephalic-vagal reflection. The releasing phase of cephalic hormone occurs due to the vagal activation of efferent fiber to respond to something related to foods or sensory stimulation.

Gastrointestinal motility refers to gastrointestinal sounds. The sounds indicate the gastrointestinal has a rhythmic contraction to mix or push the foods. For post-appendectomy patients with the abdominal surgical process, anesthesia administration is useful to relieve the pain during the surgical operation. The administration of anesthesia is useful to hinder the parasympathetic nervous impulse to the gastrointestinal. Thus, the peristaltic movement is hindered. Lack of early mobility in patients with post-abdominal surgery could hinder the recovery process of the patient's gastrointestinal motilities. Adulthood age became the recovery factor of gastrointestinal motility.

OV Ajuzieogui et al (2014) found that the ileus after caesar surgical operations, on 180 women with elective caesar surgery, grouped the women into a chewing gum group (n=90) and the control group (n=90). The subjects from the chewing gum group received non-sugar gum three times a day at six hours from the surgery. They received this treatment until the first part of the flatus. For each session, they had 30 minutes to chew. In the research, the applied caesar operation was pfannenstiel surgery.

b. The Gastrointestinal Motility of Control Group Patients with Post-Abdominal Surgery with the Standard Therapy at Jayapura Hospital

The analysis results with a non-parametric test, the Wilcoxon test, showed a significant gastrointestinal motility increase before and after the standard therapy implementation with a p-value of 0.0000.

Windiarto also proved that the recovery of ileus peristaltic movement for patients with post-surgery after receiving the standard therapies of mobility: active and passive ROM was significant with a p-value of 0.0000.

Regional anesthesia could improve the active recovery of the gastrointestinal more than general anesthesia. This administration could also decrease the inpatient period of post-surgical patients. This matter happened because of the administration of opioids after the surgery with regional anesthesia (Bayoumi, 2017). Although the regional anesthesia was

safer for the patients, gastrointestinal hypo-motility still could occur due to the applied abdominal surgery or the ileus manipulation. The normal function of the gastrointestinal returns for some hours after the surgery. For patients with gastric and colon surgical procedures, the average time is between 48 and 72 hours. Patients with abdominal surgery could suffer from eliminated gastrointestinal (Celik et al., 2015). The applied early mobility intervention care by the nurses should be supportive action care for patients with post-surgery.

The implementation of early mobilization is important as the standard of an operational procedure for Enhanced Recovery After Surgery (ERAS) (Dolgun, Meryem, Arzu & Yasemin 2017). The early mobilization could smoothen the blood flow system and normalize the body system immediately. Guyton also explains that early mobility could contract the fine muscles due to the calcium ions in the muscles. The calcium ions are bound with the calmodulin ion as the protein regulator. The combination of these two ions activates the myosin kinase to phosphorylase the myosin head. Then, the head will be bound with the actin filaments to activate the whole cycle, including the gastrointestinal contraction.

The gastrointestinal contraction stimulates the fine muscles of the gastrointestinal and flatus and minimizes the distention of the body system (Guyton & Hall, 2014).

c. The Motility Value Differences of the Gastrointestinal for both Groups after the Given Treatment at Jayapura Hospital

The non-parametric test analysis with the Mann-Whitney test found the increased gastrointestinal motility difference between the groups with a p-value of 0.0000.

Ngowe et al (2012) also found that chewing gum therapy had the same result as the appendectomy opening. The research involved 46 patients with opened appendectomy surgery due to acute catarrhal appendicitis, appendicular abscess, and appendicular peritonitis by observing the first flatus, the first ileum movement, the duration, and the complication at the hospital. The results showed that from 46 patients, randomly grouped, 2 patients received chewing gum therapy (n = 23) while the remaining did not (n = 23).

The intervention group received xylitol chewing gum therapy for thirty minutes a day until the recovery of the transit gastrointestinal. In this case, the patients' demographics, the intra-operative care, and the post-operative care were the same for both groups. All patients could understandably accept and tolerate the given chewing gum therapy. The first flatus occurred after the surgery, the intervention group after 2.2 days, and the control group after three days ($p<0.0001$). The first gastrointestinal motility after 2.3 days from the surgery for the intervention group and 3.3 days for the control group ($p<0.0001$). The research noted five complications. The research also found a short

inpatient period for the intervention group (4.9 days) than the control group (6.7 days) with p lower than 0.0001.

Chewing the gum improved the appendix after being opened and relieved the ileus after the surgery. Chewing gum for patients with post-surgery improved heart performance so that the blood flow improved along with oxygen and nutrition supplies for the brain. The circulation toward the hypothalamus improves along with cognitive capability so that the patients get more relaxed and relieve stress and muscular tension. This capability makes patients more cautious and could relax their muscles to relieve abdominal distention and stimulate peristaltic movement. This therapy is affordable and recommended for developing countries in Africa.

From the results and the obtained theories of chewing the gum, most patients with post-abdominal surgery had normal gastrointestinal peristaltic movement. Chewing the gum refers to a therapy in which patients do not use their limbs completely. Thus, the therapy is recommended for patients with physical weaknesses. The therapy also does not stimulate pain from other post-abdominal surgical injuries. The process of chewing the gum, for the patients, was easy. They had to chew the gum three times a day for 30 minutes each day to stimulate the digesting system and prevent ileus of post-operation.

CONCLUSION

A. Conclusion

1. The results showed the influence of chewing gum on gastrointestinal motility decrease and gastrointestinal motility increase in patients with post-abdominal surgery at Jayapura hospital.
2. Chewing gum could be the standard therapy of surgical procedure to manage patients with post-abdominal surgery based on *Enhanced Recovery After Surgery* (ERAS).

B. Suggestions

The researchers suggest chewing gum as a self-directed care intervention and as a standard operational procedure of peristaltic movement for patients with post-abdominal surgery. Chewing gum is a method to accelerate the recovery process of gastrointestinal peristaltic movement easily and affordably.

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