

## Effect of chewing gum on gastrointestinal symptoms among women post cesarean section

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### Abstract

**Aim:** - 1- Investigate the effect of gum chewing on gastrointestinal symptoms among women post cesarean section. 2-Assess satisfaction of women with gum chewing post cesarean section. **Design:** Blinded controlled randomized clinical trial was adopted. **Setting:** The study was conducted at the obstetric and gynecologic department, Zagazig University Hospital. **Sample:** 240 women undergoing caesarean section, attended the study setting. They were divided into 2 groups :chewing gum group (intervention) and control group will have only the routine care. **Tools:** two tools (1) A structured interviewing questionnaire, (2) Postoperative Assessment record were used in the current study **Part (1): parameter of data:** Bowel movement, presence of bowel sound, Sensation of hunger and gas passage, Presence of ileus symptoms: absent or hypoactive bowel sounds non-passage of flatus or abdominal distension, Episodes of vomiting, with or without cramps abdominal pain; frequency, duration and timing. **Part (2):** Include assessment of women satisfaction with gum chewing post operative. **Results:** gum chewing significantly improved gastrointestinal symptoms with faster onset of bowel movements, first audible intestinal sounds, passage of flatus and passage of stool and women's satisfaction post cesarean section. **Conclusion:** chewing gum postoperatively, intervention that can rapid intestinal recovery as well as women's satisfaction. **Recommendation:** gum chewing can be conducted safely after cs delivery. More population should be investigated for more global evaluation.

**Keywords:** caesarean section, Post-operative ileus,, gum chewing, intestinal motility, Women's Satisfaction. .

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Date of Submission: 03-03-2021

Date of acceptance: 17-03-2021

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### I. Introduction:

Cesarean section is an operative procedure that is carried out under anesthesia whereby the fetus, placenta and membranes are delivered through an incision in the abdominal wall and the uterus. This is usually carried out after viability, i.e. 24 weeks of gestation onward. It is usually performed when a delivery would put the baby's or mother's life or health at risk; although in recent times it has been also performed upon request for child births that could otherwise have been natural (Weckesser et al., 2019).

Cesarean section surgery is accompanying by some post-operative alteration in autonomic nervous system, that give rise to lateness of intestinal function; and reducing bowel movement and driven problems (Wen et al., 2017).

Ileus is one of the most common problems associated with abdominal surgery, which is defined as the inability to pass the intestinal content or a transitory stopping, delay in recommencement of regular bowel movement for three or five days after abdominal surgery (Herman et al., 2019).

It is also considered as one of the foremost complications following abdominal surgery, which contributes, to prolong the hospital stay and increasing the cost of care, abdominal distention, and postoperative pain. In addition, it results in the inability of the mother to begin breastfeeding and ultimately lateness in recovery (Mansour et al., 2016).

The effective and harmless promotion of the recovery of gastrointestinal function after abdominal surgery and prevention of postoperative complications has begun widespread concern among medical and nursing staff (Liu et al., 2017).

### **Nursing management, post cesarean section**

The postpartum period is a time of major physical and psychological transition for the new mother and the whole family. Nursing care takes into consideration the physiological and psychological needs of the mother during the post-partum period. For maintaining nursing care quality, it is important to help the mother to promote comfort after caesarean section surgery and prevent any associated complications. The nurse must accurately observe the mother's physiological functioning and provide timely and focused nursing intervention (Çevik & Başer, 2016).

Nurses play an important role in post CS care through assessing gastrointestinal functions. She should auscultate bowel movements until normal peristaltic movement is heard in all abdominal quadrants, follow the incidence of first flutes, first defecation, time of hunger and reaction after first feeding (Murray and Mckinne., 2014).

Routine post-operative care for post CS women include forbidden oral intake until regain of intestinal functions. Indicators for regain of intestinal functions include hearing bowel sound, passage of first flatus, felling of hunger and passage of stool. Early post-operative oral feeding without resuming bowel functions may lead to serious complications as ileus. Other contributing factors to ileus is postoperative intestinal necrosis, type of anesthetic medication, intra-operative manipulation and duration of the surgery (Ge et al., 2015).

There is no single, specific treatment for post-operative ileus. Traditionally, the treatment consists of routine postoperative nasogastric decompression, Intravenous fluids, correction of electrolyte imbalances, and expectant observation. Additional measures may include the use of prokinetic agents, early enteral feeding, early mobilization, and the use of minimally invasive surgical techniques such as laparoscopy (Chan et al., 2019).

Most of these measures are standard postoperative treatment modalities, but none has an established role as a specific remedy for postoperative ileus. The efficacy of each individual modality is difficult to assess due to the wide variety of trials with different endpoints, a multitude of procedures, numerous treatment regimens and protocols, and also the lack of a common definition of postoperative ileus (Ali et al., 2019).

The health care team should search for intervention that stimulates bowel functions without oral feeding. Early ambulation have numerous known benefits. It stimulates the blood circulation and prevent postoperative blood clots. It can enhance respiratory functions and improve wound healing. Furthermore, it improves intestinal functions and improves appetite. However, it seems to be not enough because it does not have a direct effect on the gastrointestinal system (Yuliana et al., 2019).

Another intervention that has a direct effect on the gastrointestinal system is needed. This intervention is non-sugared gum chewing. It can act as placebo feeding that stimulates cephalic vagal reflex of the gastrointestinal system. This myoelectric activation can intern stimulates the secretion of gastrointestinal hormones. This stimulation acts to increase salivation, stomach, intestine and pancreatic secretions. In other word, non-sugared gum chewing acts a virtual diet for the gastrointestinal system and intern stimulates its functions (Mansour et al., 2016).

If such simple, cheap, affordable, and easy intervention is approved to be effective, it can be essential post-operative care that enhance bowel functions. It can also enhance postpartum accommodation, improve women comfort, reduce risk for post-operative ileus, and decrease hospital stay and cost (Weekley & Tucker., 2019).

### **AIM OF THE WORK**

#### **This study aim to:**

- Assess satisfaction of women with gum chewing intervention after cesarean section.

#### **Research Hypothesis:**

the women will be satisfied after Gum Chewing intervention.

#### **Tools: Tools of data collection:**

#### **Research Design:**

Blinded controlled, randomized clinical trial was adopted in this study to meet the aim of the study.

#### **Study Setting:**

The study conducted at the obstetric and gynecologic department, Zagazig university Hospital.

#### **Target population:**

The population of this study was conducted on women undergoing caesarean section.

#### **Sample:**

A consecutive random sample of 240 women immediately post-operative recruited in this study, according to the inclusion and exclusion criteria.

#### **Inclusion Criteria:**

- Caesarean section with spinal anesthesia.

- Single pregnancy.
- Cooperativeness toward chewing

**Exclusion Criteria:**

- Postpartum bleeding, previous bowel surgery.
- History of abdominal pathology; e.g. pancreatitis or peritonitis.
- General diseases e.g. diabetes, coagulopathy, pre-eclampsia or eclampsia.
- No teeth or defective or incomplete chewing movement.

**Tools of data collection:**

There was two tools of data collection were used in this study to collect the needed data. This tools were prepared by the investigator based on the relevant literatures.

**Tool (1): A structured interviewing questionnaire:**

It was used to collect the information from the study women it consist of (3) parts:

**Part (1):** includes socio-demographic data as age, education, occupational.

**Part (2):** includes obstetrical history as number of Gravidity, number of Parity, Previous fetal losses, mode of previous deliveries, gestational age of current pregnancy, Indication of C.S, and number of previous C.S.

**Part (3):** includes medical and surgical history, Preoperative data and operative data, and bowel habit.

**Tool (2): Postoperative Assessment form:**

It was comprised type and duration of operation as well as the assessment of the bowel status during examination and assessment of women satisfaction it consist of (2) parts:

**Part (1): parameter of data:**

- Bowel sounds: Presence or absence, timing of first heard and their character (strength and frequency)
- Indicators of peristaltic movement (Bowel movement, presence of bowel sound, Sensation of hunger and gas passage).
- Presence of ileus symptoms: absent or hypoactive bowel sounds non-passage of flatus or abdominal distension.
- Episodes of vomiting, with or without cramps abdominal pain; frequency, duration and timing.

**Part (2):** Include assessment of women satisfaction with gum chewing post operative.

Numeric rating scale(NRS) is: “Not at all Satisfied,” “Partly Satisfied,” “Satisfied,” “More than Satisfied,” “Very Satisfied,” numbering 1 to 5 as an interval scale(Nie et al., 2017).

**Part (3):** Include assessment of women pain with gum chewing post operative.

The Wong-Baker FACES Pain Scale combines pictures and numbers for pain ratings, Six faces depict different expressions, ranging from happy to extremely upset. Each is assigned a numerical rating between 0 (smiling) and 10 (crying)(Kempner., 2017).

**Content validity:**

The tool was revised by five expertises for clarity, relevance, applicability, comprehensiveness, understanding and ease for implementation. According to their suggestions, the modifications were applied.

**Pilot study:**

A pilot study was carried out before starting the actual data collection. The purpose of the pilot study was to ascertain the clarity, and applicability of the study tools, and to identify the obstacles and problems that may be encountered during data collection. It also helped to estimate the time needed to fill in the questionnaire. It was done on 10% of the participants, and these were not included in the total sample of the research work to ensure stability of the answers. Based on the results of the pilot study, modifications, clarifications, omissions, and rearrangement of some questions were done.

**II. Administrative design.**

An official approval letters directed from the Dean of the Faculty of Nursing at Suez Canal University to the medical and nursing directors of Zagazig University Hospital (obstetrics department) to obtain their permission and cooperation.

**Ethical consideration:**

Written approval was obtained from the women after a brief explanation of the study. The technique used was proven to be of no harm to the patients. Patients have had the right to refuse to participate or withdraw at any time during the trial with no consequences whatsoever on the care given. All data was kept confidential and was used only for research purposes.

**III- Operational design:**

The operational design of this study included the preparatory phase and study procedure.

**Preparatory phase:**

**Preparation of the study tools:**

This phase involved reviewing of related literature and theoretical knowledge of various aspects of the study subjects. This was achieved using text books, articles, internet periodicals, and other scientific journals. This helped in the selection and preparation of the data collection tools and in writing the review of literature.

**Procedure:**

Data collection was started and completed within 7 months from the first of June 2018 until the end of December 2018. The investigator introduced herself to all women then explained the purpose of the study in order to obtain their cooperation.

**Interviewing phase:**

Before the intervention, in the selected immediately post-operative setting of the study, the researcher will introduce herself to the women, based on the pre-mentioned inclusion and exclusion criteria. Suitable subjects will be excused to participate in the study. Written consent will be taken, and data will be collected using the pre constructed tools through face to face interview.

**Assessment phase:**

Before the intervention, to assure blinding, the examiner will not be the researcher and will not know who of the patients will receive chewing gums and who will not.

**Intervention phase:**

Following complete recovery, women of the study group will be instructed to chew one stick of sugarless gum (Samara foods, Cairo, Egypt) for 15 minutes, every 8 hours(0,8,16). The researcher will provide each woman with required amount of gum sticks. Meanwhile, women in the control group will follow the postoperative hospital routine care. Each woman in both groups will be examined abdominally using a stethoscope to detect the intestinal movement every one hour, and the number of sticks taken by the patient will be recorded during the recording of vital data postoperatively, and will be asked to report immediately the time of either passing flatus or stool(Wafaa., 2013). Following each abdominal examination, the attending physician or nurse will fill the tool of the study mentioned earlier. In addition, patients will be asked about their opinion about the chewing gum as satisfied or not satisfied and any inconvenience if ever.

**IV. Statistical Design:**

All collected data were organized, categorized, tabulated, entered, and analyzed by using Statistical Package for Social Sciences (SPSS) a software program version 14, which was applied to frequency tables and statistical significance. The statistical significance and associations were assessed using, the arithmetic mean, the standard deviation (SD), pearson chi-square test ( $X^2$ ) and correlation (r) to detect the relation between the variables.

**II. Results:**

**Table (1) percentage Distribution of the studied groups regarding their Sociodemographic characteristics.**

Variable	Control group		Study group		X2	P
	N	%	N	%		
Age (years)						
18-<20	2	1.7	2	1.7	2.7	>0.05
20-<25	29	24.2	22	18.3		
25-30	74	61.6	77	64.2		
31-37	15	12.5	20	16.7		
Mean ±SD	27.0±3.5		27.5±3.5			
Residence						
Rural	68	56.7	74	61.7	2.5	>0.05
Urban	52	43.3	46	38.3		
Education						
Illiterate	5	4.2	9	7.5	3.2	>0.05
Primary	19	15.8	12	10.0		
Secondary	75	62.5	73	60.8		
University	21	17.5	26	21.7		
Occupation						
Housewife	93	77.5	85	70.8	3.5	>0.05
Working / job	27	22.5	35	29.2		

Table (7):Percentage distribution of thestudied groupsregarding their post-operativesedative analgesia(n=120).

Variables	Control group		Study group		X2	P
	N	%	N	%		
Postoperative sedative analgesia	16	13.3	8	6.7	4.1	<0.05*

Table (10):Percentage distribution of the studied women in gum groupregardingtheir degree of satisfaction about chewing gum(n=120).

Variable	Gum group	
	N	%
Satisfaction about chewing gum		
Very Satisfied	91	75.8
Satisfied	27	22.5
Not at all Satisfied	2	1.7

Table (12):Distribution of the studied groups regarding their postoperative abdominal pain during the study duration: (n=120).

Variable	Control group		Study group		X2/T	P
	Mean ± SD		Mean ± SD			
Repeated measures For pain severity during the study duration						
1 <sup>st</sup> hr (0)	4.42	±2.24	4.35	±2.33	2.0	<0.05*
2 <sup>nd</sup> hr (8)	3.63	±2.23	3.36	±2.21	2.3	<0.05*
3 <sup>rd</sup> hr (16)	5.92	±2.65	5.21	±2.35	3.4	<0.05*
4 <sup>th</sup> hr (24)	5.16	±2.26	4.73	±2.37	3.8	<0.05*

**Table (13): Distribution of the studied groups regarding their post operative ileus symptoms (n=120).**

Variable	Controlgroup		Studygroup		X2	P
	No	%	No	%		
Abdominal distension:						
yes	63	52.5	14	11.7	43.5	<0.001**
no	57	47.5	106	88.3		
Nausea						
yes	51	42.5	9	7.5	40.9	<0.001**
no	69	57.5	111	92.5		
Vomiting						
yes	62	51.7	7	5.8	39.887	<0.001**
no	58	48.3	113	94.2		

### III. Results:

**Table(1)**describes the demographic characteristics of the studied groups. As shown there were no statistical significant differences between the two groups regarding their age, education, residence, and occupational status.

Table (7)describes the post-operative sedative analgesia of the studied groups. As shown, there was statistical significance difference between the two groups regarding postoperative sedative analgesia.

Table (10)describes the degree of satisfaction about chewing gum of the studied women in gum group. As shown,three quarters (75.8%) of the gum group reportedvery satisfied, mean while only 1.7 % of them reported not at all satisfied.

Table (12)describes thepostoperative abdominal painof the studied groupsduring the Study duration. As shown there wasstatistical significance differences between the two groups regardingrepeated measures for pain severity during the study duration.

Table (13)describes the postoperative ileus symptoms of the studied groups. As shown,there were highly statistical significance differences between the two groups regarding the occurrence of postoperative illeus and its related symptoms such as feeling of abdominal distention, nausea, and vomiting.

### IV. Discussion

Caesarean section (CS) is the most common major surgery in the world and the rates are increasing (**Degani et al., 2015**). Postoperative ileus is an impaired condition of gastrointestinal motility defined as the interval from surgery until the passage of flatus or stool and the tolerance of an oral diet, that should occur within the fourth postoperative day and complicates up to 20% of caesarean delivery(**Lee et al., 2016**) . It can lead to abdominal distension, vomiting, postoperative pain/discomfort and prolongation of hospital stay thus resulting in significant morbidity. (**Wen et al., 2017**)Many methods have been advocated to speed bowel recovery after caesarean delivery such as ambulation, early hydration and chewing gum.4 Chewing gum acts similar to sham feeding and activates the cephalic vagal pathway which results in both humoral and nervous stimulation of bowel motility. It has been proven to hasten return of gastrointestinal motility in non-obstetric abdominal surgery(**Ciardulli et al., 2017**) .

In the present study, there were no statistical significant differences among two groups regarding their age, education, residence, and occupational status. In the same line, **Mansour et al., (2016)**supported that, the results of the current study. They conducted study in Egypt, about, (Chewing Gum after Cesarean Section).They found that, there were no statistically significant differences between both groups regarding their general characteristics; age group, educational level, work and residence.

In the present study, there were highly statistically significant differences among two groups concerning the occurrence of postoperative ileus and its related symptoms such as feeling of abdominal distention, nausea, and vomiting.

In agreement with the current study finding, **Hassan et al., (2019)**, conducted study in Egypt, about (Effect of Three Different Nursing Interventions on Intestinal Motility and Women's Satisfaction Post-Cesarean Section Birth).They demonstrated that, the gum-chewing group had more satisfaction than other groups; in the chewing gum group more than half women reported that, they were completely satisfied when compared with other groups.

Also, **Ciardulli et al., (2018)** agreed with the present results, conducted study in Italy, about Chewing gum improves postoperative recovery of gastrointestinal function after cesarean delivery, they showed that the chewing gum group had significantly higher satisfaction.

In the same line, **Xu et al., (2018)**, supported the results of the current study, who conducted study in China, about the effect of chewing gum on gastrointestinal function after gynecological surgery. They reported that, gum chewing significantly improve bowel function parameters. Furthermore, it significantly decreased the incidence and severity of post-operative abdominal distention, nausea and vomiting.

In agreement with the current study finding, **(Urcanoglu, & Yildiz., 2020)**, conducted study in India, about (Effects of Gum Chewing on Early Postoperative Recovery After Laparoscopic Cholecystectomy Surgery). They demonstrated that, there was no statistically significant difference between two groups concerning the age groups and the frequency of defecation in the study, There was a statistically significant difference between the two groups concerning The abdominal pain.

In the same line, **Mahmoud and Mohammad., (2018)**, supported the results of the current study, who conducted study in Egypt, about ( Chewing gum for declining ileus and accelerating gastrointestinal recovery after appendectomy) they reported that there was no significant statistical difference between intervention and control groups regarding their age, sex, educational qualification, residence, and occupational status.

In agreement with the current study finding **(Yang et al., (2018)** conducted study in china, about (Chewing Xylitol Gum could Accelerate Bowel motility ) they reported that there was a statistically significant difference concerning reduction in all paralytic ileus-related outcomes with gum chewing.

## V. Conclusion

Chewing gum scored better effect of hearing bowel sound, pass stool as well.

### Recommendations:

Based on the findings of this study, the following recommendations are suggested:

- (1) Involvement of chewing gum after cesarean section into nursing curriculum.
- (2) Conducting a further study for evaluating the effect of chewing gum on postoperative ileus among abdominal surgery patients using a larger sample and different geographical areas in Egypt.

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