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Effect of Three Different Nursing Interventions on Intestinal Motility and Women's Satisfaction Post-Cesarean Section Birth

Hanan Elzeblawy Hassan[1,*], Abeer Nasr El-Deen El-Sadek[2], Laila Abdelnaby Hamed Ali[3]

[1]Maternal & Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt
[2]Lecturer of Maternal and Newborn Health Nursing, Faculty of Nursing, Beni-Suef University, Egypt
[3]Lecturer of Medical Surgical Nursing, Faculty of Nursing, Zagazig University
*Corresponding author: nona_nano_1712@yahoo.com

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Abstract **Background:** A major complication of abdominal surgical procedures is paralytic ileus which results in patient discomfort, prolonged length of hospital stay and increased cost of treatment. **Aim:** The study aimed to evaluate effect of three different nursing interventions on intestinal motility and satisfaction of women's post-cesarean section birth. **Design:** Randomized controlled comparative study. **Setting:** This study was conducted in obstetric department, university hospital at Beni-Suef city; it was carried during the period from July 2018 to July 2019. **Subjects:** A total of 240 females divided into 4 groups of 60 subjects each were included within the scope of the sample. **Method:** The women who underwent cesarean birth were divided into four groups, depending on the use of four different methods of gum-chewing, early oral-hydration, and early mobilization. No intervention was applied to the women in the control group. For the four groups, the intestinal sounds were checked every 30 minutes with a stethoscope over the abdomen and the first time of passing gas were recorded by asking the mother. The data were evaluated with numbers, mean, and percentage calculations. **Results:** The three different nursing interventions (sugarless gum chewing, early mobilization and early hydration) are effective methods in respect of intestinal motility and women's satisfaction in post-cesarean section birth. However, earlier, hearing of intestinal sound, passing gas and bowel movement in the first group that received gum-chewing compared to the other groups ($p < 0.001$). **Conclusions:** Chewing gum is the best nursing intervention followed by oral hydration and then early mobilization post cesarean section on intestinal motility, in prevention of paralytic ileus as well as women's satisfaction. **Recommendation:** Gum chewing, early mobilization and early oral hydration can be conducted safely after CS delivery. More population should be investigated for more global evaluation.

Keywords: *gum chewing, oral hydration, mobilization, intestinal motility, cesarean birth, Women's Satisfaction.*

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1. Introduction

Cesarean section is one of the most dependable abdominal surgical operations. Although cesarean section can be life-saving for the mother and their baby when necessary, it carries the risk of causing more problems than vaginal birth [1].

Cesarean sections done every year are increasing in number dramatically all over the world. So, it became very significant to give more attention to their postoperative care. Return of intestinal movement and passage of flatus are painstaking vital factors affecting the duration of postoperative hospital stay in addition to other factors like the used anesthesia, wound healing, and breastfeeding [2,3].

Complications after cesarean section are like to other abdominal surgeries such as appendectomy, inguinal hernia surgery, and laparotomy. Among these potential complications are atelectasis, wound infection, paralytic ileus, urinary retention, urinary tract infections, endometriosis, hemorrhage, postpartum hemorrhage, adhesion, hematoma, thrombophlebitis, venous and pulmonary embolism, coagulopathies, as well anesthesia-related problems and urinary tract infection. These problems also are among the most common problems after a cesarean birth [4]. These complications are the leading causes of maternal morbidity and mortality during the postpartum period [5,6,7,8].

Cesareans happen as an alternative method to sustain the health of the mother and their baby when vaginal delivery is risky or impossible. Worldwide, there is an increasing tendency of cesarean birth as it avoids pelvic

relaxation or enables the gynecologists to determine the time and duration of the birth. Also, cesareans may be favored by mothers because of the fear of labor pain, they will terminate the birth rapidly, and the impression that cesarean birth is reliable [9,10,11].

A high cesarean section frequency is present in several countries. Though, the cesarean birth rate suggested by the world health Organization (WHO) in 2000 is 15%. According to the WHO report (2009), between 2000 and 2008, the average cesarean birth ratio in the world was 13.9% [12]. Worldwide, according to the world health organization, Brazil ranks first in CS rate (56.0%) followed by Turkey (53.1%) [13]. Egypt came in the third rank in 2014 based on the results of Egypt demographic and health survey. It reported that the rate of CS surged to 52% [14]. While Mexico 36.1%, Portugal 34.0%, United States 30.2%, and Germany 27.8% [12] In Turkey, the percentage of cesarean birth was 21.2% in 2003, 36.7% in 2008, and increased to 48.5% in 2013, 53.1% according to world health statistics (2015) [15].

The traditional method of giving the patient nothing orally or delayed mobilization or without any intervention postoperatively till bowel function returns (in the form of bowel movement or passage of flatus) followed by slow feeding or delayed mobilization is now challenged and became controversial. The importance of early oral hydration, early mobilization and gum chewing postoperatively depend on that, this intervention can stimulate a reflex causing a coordinated propulsive activity and increasing the secretion of gastrointestinal hormones [16]. The theory behind gum chewing is that it imitates feeding and has been deemed a form of sham feeding, promoting the gastro-colic reflex and starting the cephalic digestion stage to improve gut motility safely. Some steps in understanding postoperative ileus`s etiology along with its prevention and management have been made. Gum chewing focuses more on the neurogenic component in attempting to promote the fasting state of the Migrating Motor Complex and simulate stronger peristaltic contractions that represent a fed state [17]. It has been studied in different parts of the world and was proved to minimize postoperative stay according to the passage of flatus. These effects cause an overall positive effect on intestinal movement decreasing the duration of postoperative ileus [2,18].

Early oral hydration, early mobilization, and gum chewing also may be related to the reduced depletion of protein stores and improvement in wound healing with a faster recovery. There was a conviction that postoperative early mobilization, gum chewing and early oral hydration without bowel movements return could cause nausea, vomiting, and abdominal distention leading to wound breakdown. However, this conviction changed because the duration of surgery became shorter, the spinal anesthesia became more available, and intestinal manipulation during surgery became minimal. All these factors provided the chance for early oral hydration, early mobilization and gum chewing before bowel movements return [1,19].

The length of hospitalization may be extended due to problems mostly caused by anesthesia; these include atelectasis, aspiration, and pneumonia in the respiratory system, urinary retention, and kidney dysfunction in the urinary system, nausea, vomiting, gastric dilatation, paralytic ileus, and abdominal distension in the gastrointestinal system. Postoperative ileus is an important problem after abdominal surgery, which is the temporary breakdown of intestinal motility. Among the practices used to return intestinal motility, there is abdominal massage as well as interventions such as start of early nutrition, early postoperative mobilization, and chewing gum [1,2,20,21].

1.1. Significant of the Study

World health organization states that CS percentage should not exceed 10-15%. Many countries use measures to diminish the high CS rate to avoid associated antenatal and perinatal risks [22]. In Egypt, the past decade has witnessed a sharp rise in the prevalence of CS with the most recent Egypt Demographic and Health Survey (EDHS) documenting a CS rate of 52 percent, which suggests that cesarean delivery might be overused or used for inappropriate indications. Cesarean section (CS) is an important lifesaving operation when vaginal delivery might pose a risk to a mother or baby. However, if not medically indicated or if performed under suboptimal conditions, CS can cause maternal and fetal complications, including death [23]. There were 16234 births at Beni-Seuf general hospital of which 5285 women were delivered by CS accounting for an incidence of 32.6% [22]. The cost, length of hospitalization and problems may be extended due to problems mostly caused by CS complications. Minimizing the complications that may happen after cesarean section can be accomplished with the use of high quality, efficient, and evidence-based nursing care. We believe that anesthesia complications after cesarean birth can be reduced and the women who are given chewing gum, engaged in early oral hydration, and mobilized early can recover faster. Nurses can have a significant role in quickening the mother’s healing process and easing her adaptation to a new life and role, and can, therefore, contribute to the national economy with such evidence-based care.

1.2. The Aim of the Study

The study aimed to evaluate effect of three different nursing interventions on post-cesarean section birth women's intestinal motility and satisfaction.

1.3. Research Hypothesis

i. Intestinal motility expect to be earlier in different three nursing intervention groups than the control group
ii. Post cesarean section birth; women's satisfaction expects to improve.

2. Subjects and Method

2.1. Study Design

A randomized controlled trial; the quasi-experimental research design used to achieve the aim of this study. This

design used to compare matched groups (gum chewing, early oral hydration, early mobilization, and control group) of women and measure the degree of change occurring as a result of the intervention.

2.2. Study Setting

This study was conducted at Obstetric department, university hospital at Beni-Suef University; it was carried during the period from July 2018 to July 2019.

2.3. Subjects

Pregnant women were recruited from those attended Obstetric department, University hospital at Beni-Suef University and scheduled for cesarean section.

Inclusion criteria

1. Term pregnancy,
2. Women aged 20-35 years.
3. Estimated gestational age is ranging between 37-40 weeks gestation.
4. Uncomplicated Elective LSCS, time of CS doesn't exceed 90 Minutes,
5. Average blood loss during and after CS (doesn't exceed 1000 cc)
6. All patients will be under spinal anesthesia
7. Level of hemoglobin is not less than 10 g/dl.
8. No history of GI problems with the previous pregnancy
9. Accepting to participate in the study.

Exclusion criteria

1. Women aged < 20 and >35 years
2. Caesarean hysterectomy.
3. Surgical complications, medical disorders such as DM and hypertension
4. Patients having factors affecting blood loss as anemia

Out of 280 women who underwent cesarean section under spinal anesthesia and matched the inclusion criteria, 10 women refused to participate in the study, 2 withdrawn before completion of the study, moreover, the researchers were excluded 28 students of a pilot study from the sample. So, this study included 240 women, all of them underwent uncomplicated cesarean section under regional anesthesia, they were randomly assigned into four groups: **Group A** (Immediate sugarless gum-chewing group "60 women"): these women received sugarless gum chewing in the first 1 hours postoperatively, **Group B** (Immediate early mobilization group "60 women"): these women early mobilized in the first 1 hours postoperatively, after sitting 15 minutes in bed in order to prevent hypotension, **Group C** (Immediate early hydration group "60 women"): these women received clear fluids in the first 2 hours postoperatively and **Group D** (control group "60 women"): these women did not receive any intervention.

2.4. Tools of Data Collection

Data were collected by three tools as the following:

1. Structured interview questionnaire; which headed into two sections

A. *Socio-demographic data and women's present and past histories; which contain four sections*

1) **Personal history**: It included age, education, occupation and time of follow up.
2) **Obstetric history:** It included the number of gravida times, previous delivery methods, pregnancy medications, causes of CS, operation time by minutes.
3) **Past history:** It included the history of any medical disorder or surgical history.
4) **History of present illness:** It included the medical and surgical condition to define high-risk pregnancy

B. *General and abdominal examination which headed into two sections*

1) **TPR chart:** to assess pulse, blood pressure and temperature; as general examination.
2) **Stethoscope** and manual abdominal examination to assess abdominal distension. Moreover, Women's complaints from signs and symptoms as vomiting e.g. color, amount, odor consistency, etc.

2. Numerical rating scale (NRS) [24,25]

It means (verbal rating scale (VRS); visual analogue scale. VAS for studied groups; adopted from Hockenberry & Wilson, (2015) and Song et al., (2016); it was used to measure vomiting, flatulence, and pain severity. It consisted of a line divided by numbered points ranged from (0-10) consisting of six cartoon faces that range from a neutral expression (0 no pain) to a screaming face (10 hurts more than. Women`s answers were sorted as follows: No pain (zero), mild pain (1 to < 4), moderate pain (4 to < 7) and severe pain (7-10) [26,27].

3. Likert-scale Rating: to assess woments` satisfaction

Adapted from Friedel et al., it was used to assess parents' satisfaction regarding the this scale formed of 5 variables; (1) women were comforted by the use of the intervention; (2) it was a positive experience; (3) intervention is not easy to use; (4) wouldn't like to use the intervention in the future. The Likert scale consists of 5 statements and was based on a five points 1= Completely satisfied, 2= Satisfied, 3= Fair, 4= Dissatisfied, 5= Completely dissatisfied [28].

2.5. Validity and Reliability of Study Tools

Content validity was ascertained by a group of experts (3) Obstetrics and Gynecology Nursing, and (2) medical and surgical nursing specialties. Their opinions were elicited regarding the tools format layout, consistency, scoring system. Modifications for the tools were done according to the experts' judgment on the clarity of sentences, appropriateness of content and sequence of items. The experts were agreed on the intervention but recommended minor language skills changes that would make the information clearer. Reliability of all items of the tools was done. The reliability test was established by using the Cronbach alpha to assess internal consistency construct validity. Cronbach alpha (r = 0.86).

2.6. Ethical Considerations

All participating women were informed about the aim of the study, its benefits, to obtain their acceptance to

participate. The researchers informed them that the participation in the study is voluntary; they have the right to withdraw from the study at any time, without giving any reason and their responses would be held confidentially. Secrecy and privacy of all the data will be assured. A consent was obtained from those who welcome to participate in the study.

2.7. A Pilot Study

A pilot study was approved on 10% of the total sample to test the clearness and applicability of the study tools as well as approximation of the time needed to completion of each study tool. Those who contributed in the pilot study were later excluded in the study as there were no modifications on to the tools.

2.8. Field Work

- After gaining official approval from the director of Beni-Suef university hospital and agreement of the chairman of obstetric and gynecologic department, data were collected through a period of nearly 13 months from the beginning of July 2018 to the end of July 2019. The aim of the study at first was simply explained to women under study. The researchers started to collect data from the women at the selected setting.
- The researcher started the study by visiting the sitting of the study 2 days/week (Mondays & Tuesdays) during the morning shift in the previously mentioned setting from 9.00 a.m. to 2.00 p.m.
- All engaged women were informed that participation is voluntary and have the right of accepting or refusing participation in the study.
- The first method of data collected from engaged women through interviewing questionnaire. The researcher introduced herself to the participant women and obtained her approval to participate in the study. The researcher collected socio-demographic, obstetrical and medical history. Otherwise, time 10-15 minutes for pain scale, about 10 minutes for patients' satisfaction assessment. The researcher inquired questions in a simple Arabic language and noted the answers in the structured interview tool. Interview consumed about 10 -15 minutes for each.
- After the cesarean section was done, each woman had a numbered opaque envelope which was opened just after the operation to indicate the assigned groups.
- According to the hospital protocol in the Obstetrics and Gynecology Services; Foley's catheters of the women are removed 8 hours after surgery and the women are then mobilized. A total of 3,000 mL intravenous fluids are administered in the postoperative period. Oral fluid intake is started after 8 hours (even if intestinal motility has not started) after the cesarean is performed under spinal anesthesia. There were three different interventions in the study, including sugarless gum chewing, early oral hydration, and early mobilization.

1. Group A: The Chewing sugarless Gum Group

The women in this group were instructed to chew sugar-free gum for 15 minutes every 2 hours, starting 1 hour after the cesarean surgery. The women did not chew gum during the night. The women chew gum from 12:00 a.m. to 8:00 a.m. They were followed up until the start of the intestinal motility and passing gas. At that point, they were then allowed to start oral intake and gum-chewing activity was completely ended.

2. Group B: Early Oral Hydration Group

The women in this group were instructed to drink 50 mL of water or clear fluid at an average of 2 hours after the cesarean birth, and 100 mL water every hour in the following hours. The women continued to drink water until intestinal sounds were heard.

3. Group C: Early Mobilization Group

The women in this group were instructed to mobilize after sitting 15 minutes in bed to prevent hypotension, starting mobilization from the fourth hour after the cesarean birth. The women walked three times a day, approximately 5-10 m when they felt good.

4. Group D: Control group

The women in this group were without any intervention (traditional and routine method). According to the hospital protocol in the Obstetrics and Gynecology Services; the Foley's urethral catheters of the women are removed 8 hours after surgery and the women are then mobilized. Oral fluid intake is started after 8 hours (even if intestinal motility has not started) after the cesarean is performed under spinal anesthesia.

- Intravenous fluids regimen and analgesia: All women were given the same hospital intravenous fluid regimen which was 500 ml of 5% glucose every 6 hours, 500 ml of Ringer lactate every 12 hours and 500 ml of normal saline every 24 hours. Taking into consideration that these intravenous fluids were discontinued when the bowel movements started early and the woman feeding was well established before 24 hours. All women received the same routine analgesia that was added to the first bottle of intravenous fluids given to them in the recovery room; it was ketolak 30 mg IV injection/12 hours.
- **Data collection about the primary outcomes:** While the woman was in the recovery room and after transferring her to the postpartum ward, the following data were collected by the caregivers after excluding postpartum hemorrhage: The occurrence of vomiting, abdominal distention and abdominal pain. These data were taken from women every 1 hour in the 1st 2 hours, then every 2 hours until the time of hospital discharge (depending on that 0 hours is the onset of surgery end).
- **Data collection about the secondary outcomes:** The occurrence of nausea and abdominal pain; Similar to the primary data, these data were collected from women every 1 hour in the 1st 2 hours, then every 2 hours until the time of hospital discharge. The degree of pain was determined according to the visual analog scale VAS which includes 5 points verbal descriptive scale (nil, mild, moderate, severe and very severe) and by using a

simple questionnaire with recording the pain beginning from the moderate degree. Return of intestinal movements: and this was done by recording the timing of hearing of the 1st intestinal sound. Abdominal auscultation was done 2 hours postoperatively and every 2 hours to detect intestinal sounds, taking into consideration that the participants didn't receive any antiemetics or laxatives routinely during the follow-up period. 1st Passage of flatus; the woman was asked about that every 2 hours postoperatively. Duration of hospital stay; it was calculated by recording the timing of hospital discharge. The routine hospital stay period (from the surgery onset until the hospital discharge) ranges between 24-48 hours. Hospital discharge was done when the following criteria were met; tolerance of the regular diet without nausea or vomiting, return of intestinal movement breastfeeding success, normal vital signs, ability to ambulate and urinate without assistance, and absent unresolved postoperative complications.

- A questionnaire about psychological satisfaction; psychological satisfaction was one of the secondary outcomes to be reported. So, before the woman discharge from the hospital, she was asked about her psychological satisfaction regarding the timing of three intervention initiation according to the group she was enrolled in, using women's satisfaction tool one time at discharge to know if she is planning to repeat the same intervention in the following deliveries.

2.9. Statistical Analysis

The data were collected and entered onto the Microsoft access database to be analyzed using the Statistical Package for Social Science (SPSS Inc., Chicago, version 21). Statistical significance was considered at P-value <0.05.

3. Results

Table 1 shows the demographic characteristics of studied groups; insignificant differences were observed between 3 groups regarding all items of socio-demographic characteristics (p > 0.05) which indicated homogeneity of all studied groups.

Table 2 shows the previous obstetric and gynecological history of studied groups; insignificant differences were observed between 3 groups regarding all items of previous obstetric and gynecological history (p > 0.05) which indicated homogeneity of all studied groups.

Table 3 shows that there were statistically significant differences between studied groups in systolic, diastolic BP, flatus passage, external wound healing after 1 week and hospital stay (hours) (p-value < 0.001). On the other hand, no difference observed regarding the pulse and temperature between both groups.

Table 4 shows there was a statistically significant difference between studied groups in bowel function assessment time (p-value <0.001), while there was an insignificant difference between studied groups in methods of bowel function assessment. Moreover, all number of Gums chewing group was heard in the first 6 hours when compared with other groups of study.

Table 5 shows comparison between the studied groups according to their symptoms and signs of GIT disturbance. No statistically significant differences observed between all groups regarding nausea, vomiting, pain, and abdominal distention (p-value <0.05).

Table 6 shows there was a statistically significant difference between all groups (gum chewing, early oral hydration, and early mobilization) regarding women satisfaction, (p-value <0.001).

Table 1. Distribution of the studied groups according to their socio-demographic characteristics (n=240).

Variables	Gum Chewing group (n=60)		Early Mobilization group (n=60)		Early Oral Hydration group (n=60)		Control group (n=60)		P-value
	N	%	N	%	N	%	N	%	
Age									
20- 30 years	43	71.7	36	60.0	40	66.7	35	58.3	> 0.05
30-35 years	17	28.3	24	40.0	20	33.3	25	41.7	
M±SD	27.58 ± 3.74		30.13 ± 5.01		29.10 ± 4.04		30.01 ± 4.02		
Qualifications									
Basic Education	13	21.7	28	46.7	30	50.0	26	43.3	> 0.05
Moderate Education	27	45.0	16	26.7	20	33.3	18	30.0	
High Education	8	33.3	16	26.7	10	17.7	16	26.7	
Mothers' job									
House wife	25	41.7	36	60.0	34	56.7	32	53.3	> 0.05
Working	35	58.3	24	40.0	26	43.3	28	46.7	
Starting time of follow up									
From the 1st trimester	19	31.7	24	40.0	20	33.3	25	41.7	> 0.05
From the 2nd trimester	41	68.7	36	60.0	40	66.7	35	58.3	

Table 2. Frequency distribution of the studied groups according to their previous obstetric and gynecological history (n=240)

Variables	Gum Chewing group (n=60)		Early Mobilization group (n=60)		Early Oral Hydration group (n=60)		Control group (n=60)		P value
	N	%	N	%	N	%	N	%	
Number of gravida times									
One	18	30.0	16	26.7	20	33.4	17	28.3	> 0.05
Two	17	28.3	16	26.7	12	20.0	13	21.7	
> Two	25	41.7	28	46.6	28	46.6	30	50.0	
Previous delivery methods									
Normal	24	40.0	12	20.0	10	17.7	14	23.3	> 0.05
Normal with episiotomy	4	6.7	4	6.7	8	13.3	6	10.0	
Cs	32	53.3	44	73.3	42	70.0	40	66.7	
Pregnancy medications									
No medication used	0	0.0	8	13.3	10	17.7	9	15.0	> 0.05
Antibiotics	7	11.7	4	6.7	15	25.0	15	25.0	
Vitamins and minerals	40	66.7	36	60.0	27	45.0	21	35.0	
Analgesics	13	21.7	12	20.0	8	13.3	15	25.0	
Causes of CS									
Previous CS	36	60.0	28	46.6	40	66.7	38	63.3	> 0.05
Mal-presentation	21	35.0	24	40.0	4	6.7	10	17.7	
Maternal distress	3	5.0	4	6.7	6	10.0	4	6.7	
Premature rupture of membrane	0	0.0	4	6.7	10	17.7	8	13.3	
Operation time per minutes									
30 min	0	0.0	12	20.0	10	17.7	8	13.3	> 0.05
30-60 min	60	100.0	44	73.3	42	70.0	45	75.0	
60-90 min	0	0.0	4	6.7	8	13.3	7	11.7	

Statistically insignificant at p-value > 0.05.

Table 3. Comparison between the studied groups (gum chewing, early oral hydration, early mobilization and control) after cesarean birth according to vital signs, passing gas, and hospital stay (n=240)

Variables	Gum Chewing group (n=60)	Early Mobilization group (n=60)	Early Oral Hydration group (n=60)	Control group (n=60)	P value
Pulse (Mean ± SD)	79.32 ± 3.46	79.42 ± 3.18	79.37 ± 3.18	79.62 ± 3.18	> 0.05
Systolic BP (Mean ± SD)	112.72 ± 5.63	114.90 ± 7.69	113.90 ± 6.44	116.90 ± 10.98	< 0.001
Diastolic BP (Mean ± SD)	66.15 ± 5.50	67.50 ± 5.68	66.30 ± 5.51	68.50 ± 6.69	< 0.001
Temperature (Mean ± SD)	37.09 ± 0.25	37.07 ± 0.33	37.08 ± 0.22	37.04 ± 0.13	> 0.05
Flatus passage time	8.54 ± 0.98	9.22 ± 0.68	9.01 ± 0.55	13.8 ± 3.2	< 0.001
External wound healing after 1 week	100 (100.0%)	100 (100.0%)	100 (100.0%)	100 (100.0%)	
Hospital stay (hours)	7.33 ± 0.73	9.11 ± 0.23	8.13 ± 0.53	20.28 ± 9.92	< 0.001

Statistically insignificant at p-value>0.05, Highly statistically significant at p-value<0.001.

Table 4. Comparison between the studied groups (gum chewing, early oral hydration, early mobilization and control) after cesarean birth according to methods of bowel function assessment and number of women heard bowel sound according to tie (n=240).

Variables	Gum Chewing group (n=60)		Early Mobilization group (n=60)		Early Oral Hydration group (n=60)		Control group (n=60)		P value
Methods of bowel function assessment									
Bowel sound	7	11.7	10	16.7	12	20.0	0	0.0	> 0.05
Pass flatus	21	35.0	23	38.3	25	41.7	28	46.7	
Pass stool	32	53.3	27	45.0	23	38.3	32	53.3	
Number of women heard bowel sound according to tie									
1st hour	4	6.7	2	3.3	0	0.0	0	0.0	< 0.001
2nd hours	9	15.0	4	6.7	6	10.0	0	0.0	
4th hours	12	20.0	6	10.0	7	11.7	0	0.0	
6th hours	35	58.3	20	33.3	30	50.0	4	6.7	
> 6 hours	0	0.0	28	46.7	17	28.3	56	93.3	

Statistically insignificant at p-value>0.05, Highly statistically significant at p-value<0.001.

Table 5. Comparison between the studied groups according to their symptoms and signs of GIT disturbance (n=240)

Variables	Gum Chewing group (n=60)		Early Mobilization group (n=60)		Early Oral Hydration group (n=60)		Control group (n=60)		P value
	N	%	N	%	N	%	N	%	
Nausea									
Yes	4	6.7	8	13.3	6	10.0	14	23.3	> 0.05
No	56	93.3	52	86.7	54	90.0	46	76.7	
Vomiting times									
No vomiting	60	100	58	96.7	57	95.0	50	83.3	> 0.05
1-2 times	0	0	2	3.3	3	5.0	10	16.7	
Pain									
Mild	10	16.7	18	30.0	15	25.0	5	8.3	> 0.05
Moderate	40	83.3	27	70.0	45	75.0	20	33.3	
Severe	10	16.7	15	25.0	12	20.0	35	58.3	
Abdominal distension									
Yes	5	8.3	3	5.0	9	15.0	20	33.3	> 0.05
No	55	91.7	57	95.0	51	85.0	40	66.7	

Statistically insignificant at p-value>0.05.

Table 6. Comparison between the studied groups satisfaction (gum chewing, early oral hydration, and early mobilization) after cesarean birth (n=240)

Patients' satisfaction	Gum Chewing group (n=60)		Early Mobilization group (n=60)		Early Oral Hydration group (n=60)		P value
	N	%	N	%	N	%	
Completely satisfied	31	51.7	20	33.3	21	35.0	< 0.001
Satisfied	14	23.3	12	20.0	10	16.7	
Fair	8	13.3	15	25.0	15	25.0	
Dissatisfied	7	11.7	10	16.7	8	13.3	
Completely dissatisfied	0	0.0	3	5.0	6	10.0	

Highly statistically significant at p-value<0.001.

4. Discussion

Some obstetrical complications, whether maternal and fetal, are liable for the elevated rate of an elective or urgent cesarean section when the fetal status is not reassuring, such as diabetic pregnancy. Therefore, due to the impact of general anesthesia, some gastrointestinal problems such as postoperative ileus, abdominal distension, and constipation may be seen in females after a cesarean birth. There are also, some gastrointestinal effects, such as nausea, vomiting, and abdominal pain when using oxytocin or carbetocin to prevent hemorrhage during cesarean section [5,6,7].

Early mobilization, early hydration and stimulation of intestinal activity through gum chewing are elements of postoperative multimodel applications and enhanced recovery after surgery (ERAS) program protocol. These applications have been shown to shorten the duration of postoperative hospital stay [1,29]. All over the world, cesarean sections conducted yearly are dramatically growing in number. Therefore, giving more attention to their postoperative care has become very important [19]. The traditional strategy of giving nothing orally postoperatively to the patient until bowel function returns (in the form of bowel movement or flatus passage) and slow feeding is now challenged and became controversial [18].

In the current study, more than half of women in all groups were in between 20-30 years. This finding approve by Mohamed and Gudia (2018) who studied ″ the effect of early versus delayed oral hydration on post-cesarean maternal outcome and satisfaction" in postnatal ward of women health at Mansoura General Hospital and has shown that, there were more than half of women in the study and control groups were less than 25 years [30]. The researchers select this age stage and women with medical disorders in the form of DM, and Hepatic disorders, also with women who had bleeding disorders, intraoperative bowel or bladder injury, or severe intraoperative or immediate postoperative bleeding were excluded from the study. Also, exclusion criteria were chronic gastrointestinal problems such as chronic constipation, peptic ulcer, oesophagitis, hiatus hernia or irritable bowel syndrome and having severe abdominal adhesions. All groups of the study were matched regarding maternal age, gestational age, parity and indications of cesarean section. Regarding the results of the study, it was motivating to show that there were “no” significant differences between the two groups in their characteristics and previous obstetric and gynecological history, this result supported by Ahmed et al., (2018) in his study about effect of immediate versus early oral hydration on cesarean section postoperative outcomes at Ain Shams University Maternity Hospital [2]. Additionally, Wahba et al., (2018) who

stated that, there was no significant difference between the study Group A and the control Group B regarding the demographic data and obstetrical characteristics including (maternal age, BMI, Parity and Gestational Age and CS indications) in his study about early versus traditional oral hydration after cesarean section Ain Shams University Maternity Hospital [31]. The researchers' opinion is the intestinal motility after surgery can be delayed due to manipulation of the intestines during surgery, surgical stress, postoperative effects of the anesthesia, and the opioid analgesics used. Moreover, the researchers added, may because some problems such as the inability to pass gas, the inability to have a bowel movement, hospital infections, and delayed wound healing in the early period after cesarean birth may delay discharge from the hospital. Therefore, the researchers recommend the women encouraged to mobilize early, early hydration and stimulation of intestinal activity through gum chewing to decrease of problems or complications.

The current study demonstrated that women in the gum-chewing, early mobilization and early hydration groups had a more rapid return of bowel function including bowel sounds and flatus passage time compared to the control group, with a substantially significant shorter mean postoperative time interval to the hospital stay compared to the control group. The researchers' opinion was these results due to intervention because of postoperative ileus is common and may lead to prolonged hospitalization among other complications. The difference between all groups regarding systolic and diastolic blood pressure, passing gas, and hospital stay showed a statistically significant difference except pulse and temperature, there was showed a statistically insignificant difference. The difference between all groups regarding systolic and diastolic blood pressure, passing gas, and hospital stay showed a statistically significant difference except pulse and temperature, there was showed a statistically insignificant difference. The current results approve by Darwish et al. (2019) who studied " Does gum chewing affect the timing of return of intestinal motility after elective cesarean section" at Assiut Women Health University Hospital, and has shown that, there was a statistically significant lower systolic and diastolic blood pressure in gum-chewing group with no difference regarding the pulse and temperature between both groups [17]. The researchers' opinion is this due to intervention, it is vital to encourage early feeding, early mobilization, timely removal of tubes and drains if present and function-oriented multimodal analgesia regimens. So it is very important in CS to improve bowel motility, the earlier passage of flatus, less hospital stay, and more patient satisfaction. ERAS programs are usually associated with shorter length of hospital stay, a reduction in overall healthcare costs, and improvements in patient satisfaction [17].

The present study demonstrated that women in the gum-chewing group had a more rapid return of bowel function and heard bowel sound than others groups, this results agreed with Çevik (2014); Çevik & Başer (2016) who studied " Effect of bed exercises and gum-chewing on abdominal sounds, flatulence and early discharge in the early period after cesarean section" and " The effect of gum chewing on bowel sounds, passing intestinal gas, and early discharge from hospital in early post-caesarean period" at Kayseri: Erciyes University respectively have shown that there was determined that bowel movements, passing intestinal gas and defecation started earlier in the gum group than the exercise and control groups after caesarean operation [32,33]. Furthermore, Noble et al., (2009) and Çevik & Başer (2016) who studied "Gum chewing reduces postoperative ileus" at Gaziantep, Turkey, have revealed that, there was in 8 studies for which meta-analysis was conducted, bowel sounds were found to be heard earlier in the gum-chewing group than the control group [33,34]. Overall, there were no significant differences in the rates of symptoms and signs of GIT disturbance among the study groups regarding incidence of nausea; vomiting; pain and abdominal distension which is consistent with previous studies of Guo et al., (2015) & Nantasupha et al., (2016) who studied Effect of conventional diet schedule, early feeding and early feeding plus domperidone on postcesarean diet tolerance at Mahidol University, Bangkok, Thailand and have displayed that, there were no significant differences in the rates of unfavorable postoperative outcomes among the study groups regarding incidence of nausea; vomiting; ileus; abdominal discomfort; fever; and SSI [35,36]. The researchers' opinions were (problems) abdominal distension did not develop in women who were fed early, stood up early and passed intestinal gas early after operation. Chewing gum was generally well tolerated and is inexpensive. Some studies reported less nausea and vomiting among those using chewing gum [37].

There was a highly significant difference between all groups regarding psychological satisfaction with the p-value < 0.001. The present study demonstrated that the gum-chewing group had more satisfaction than other groups; in the chewing gum group more than half women reported they were completely satisfied when compared with other groups. The researchers' opinions were this results due to chewing gum more save, inexpensive, easy and reliably improves gut motility resulting in an early passage of flatus, less hospital stay, and minimal pain score and complications, less cost on hospitals and all interventions had positive effects on intestinal functions as well. Chewing gum was generally well tolerated and is inexpensive. Some studies reported less nausea and vomiting among those using chewing gum as the study of Short et al., (2015) who studied "Chewing gum for postoperative recovery of gastrointestinal function" [37]. The researchers' opinions were that there was a difference between the chewing gum, early oral hydration and early mobilization groups and control after cesarean birth in terms of the start of intestinal motility. The best one the chewing gums following by early oral hydration and then early mobilization intervention when compared with the control group that supports the research hypothesis.

5. Limitation of the Study

Sample size was small for generalization.

6. Conclusion

In conclusion, the three different nursing interventions (sugarless gum chewing, early mobilization and early

hydration) are effective methods in respect of intestinal motility and women's satisfaction in post-cesarean section birth. However, chewing gum scored better effect of hearing bowel sound, pass stool and women's satisfaction as well. Moreover, it decreases the time for flatulence passage, hospitalization period and gastrointestinal disturbance at the postoperative period in women who were subjected to benign cesarian section birth. These results indicate that the nurses may have an important role in the duration of hospitalization period by taking an active role. This role of active interventions may effectively enhance the quality of women's life with significant contributions to the national economy.

7. Recommendation

Based on the current study findings, the following is recommended:

1. As chewing gum scored better effect on bowel sound, flatulence passage, hospitalization period, gastrointestinal disturbance and women's satisfaction; more population should be investigated and additional well-designed clinical trials as well are needed for more global evaluation to confirm these findings.
2. Implementing health education sessions for pregnant women regarding the advantages of gum chewing after cesarean section delivery and disseminate, distribute the results of the present study in postnatal units.
3. Chewing gum was a simple, non-invasive and well-tolerated strategy with least side effects. Future randomized controlled trials should focus more on the types and ingredients of different types of gum.
4. Exploring the effect of gum chewing on a different type of lower abdominal gynecological surgery using a larger sample.

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