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Effect of Multimodal Approach Application on the Expected Clinical Outcomes of Post Cesarean Section for Primiparous Women

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Abstract:

Background: Multimodal approach application is an inter-disciplinary use of more than line of treatment. Oral fluids and food are traditionally introduced slowly after cesarean section (CS). Postoperative cesarean section (PCS) complications are broadly defined as a temporary impairment of gastrointestinal (GI) motility; it leads to patient discomfort, decreases mobility, and prolongs convalescence and hospital stay.

Aim of the study: Was to examine the effect of multimodal approach application on the expected clinical outcomes of PCS for primiparous women. **Design**: Quasi-experimental design was used in this study. **Setting:** The study was conducted at the Obstetrics and Gynecology Department and the Operative Room in Kafrelsheikh General Hospital, Egypt. **Tools:** Three tools were used: Tool I; Structured interview schedule; Tool II; post-CS Analogue scale; Tool III; Clinical outcomes assessment record; **Sample:** A convenience sample of 80 female patients undergoing elective CS divided equally into two groups (control group and study group) was assigned to a multimodal approach. **Results:** There were statistically significant differences according to clinical outcomes for study and control group while the lowest p-value was (0.002) of first meal ingestion and mean value was (1.5) of first meal ingestion for the study group with SD (0.8) and mean value was (2.2) of first meal ingestion for the control group with SD (1.1). There were statistically significant differences according to time of first hydration/ hrs for study and control group consisted of (2 hrs, 4 hrs, 6 hrs and more), p-value was less than 0.001, and " mean time of first hydration/ hrs " for the study group was (2.3) with SD (1.0) versus (5.8) with SD (1.8) for the control group . Added that, there were statistically significant differences regarding "Mean of length of hospital stay " for study and control group since the P value was (0.007). Mean value for the study group was (2.6) with SD (0.9) while mean value of the control group was (3.1) with SD (0.7). **Conclusion:** The present study concluded that early feeding; hydration, analgesia, and mobilization after CS improve nausea, vomiting, and the length of hospital stay, as well as promote wound healing. **Recommendation:** This study recommended that a multimodal approach should be applied to women post-CS to improve their clinical outcomes.

Key Words: Multimodal approach, Clinical outcome, Cesarean section, Primiparous women.

1. Introduction:

Multimodal approach application is an inter-disciplinary use of more than line of treatment. Included historically; early postoperative oral fluid intake; early postoperative nutritional intake; mobilization of the patient; using of non-steroidal anti-inflammatory analgesic drugs and intravenous fluid administration ***(Booth et al., 2016)***. Oral fluids and food are traditionally introduced slowly after cesarean section (CS). Postoperative cesarean section (PCS) complications are broadly defined as a temporary impairment of gastrointestinal (GI) motility; it leads to patient discomfort, decreases the mobility, and prolongs convalescence and hospital

stay. Caesarean section (CS) is a major abdominal surgery that needs anesthesia and a recovery period where the incision is made through the skin, the underlying fat, and into the abdomen and uterus. Complications of CS include hemorrhage, pain, infection, blood clots, or impairment to the uterus. There are significant discrepancies in a woman's access to CS, depending on where in the world she lives. Conversely, in Latin America, rates are as high as (43%) of all births. In five countries (Dominican Republic, Brazil, Cyprus, Egypt (52% nowadays) and Turkey) cesarean sections now outnumber vaginal deliveries. Worldwide CS rates have risen from around 7% in 1990 to 21% today, and are projected to continue increasing over this current decade. If this trend continues, by 2030 the highest rates are likely to be in Eastern Asia (63%), Latin America, Western Asia (50%), and Northern Africa (48%) Southern Europe (47%) and Australia (45%) (Flesher et al., 2008).

Cesarean section (CS) is habitually done for primiparous women because of many maternal and fetal complications such as maternal medical condition, fetal compromised and malpresentation (Flesher et al., 2008). Kraus and Fanning, 2016, reported that the multimodal approach means using a variety of modalities that promise more robustness, which is especially important in a realistic environment such as early feeding, hydration and mobilization. The majority of researches highlight the benefits of multimodal procedures. It either focuses on a specific type of operation, like CS or general surgery (Kaboli et al., 2015). It has been demonstrated to be useful in lowering the length of time that ileus lasts. Preoperative CS women psychological preparation, intraoperative and postoperative epidural analgesia, antiemetic medications, and early postoperative nutrition and mobilization are all part of these regimens (Richard, Steinbrook, 2005).

Primiparous are traditionally fed gradually after a CS, with the goal of maintaining a regular diet until the postoperative problems are resolved (Flesher et al., 2008). Early feeding after CS has been demonstrated to be safe and effective in these studies (Pearl et al., 2016). Early feeding enhanced gastrointestinal stimuli, according to Kraus and Fanning (2016). The main concern is the clinical outcomes of post CS such as fever, shock, hemorrhage, thrombophelibitis, urinary retention, wound infection, pneumonia, constipation, nausea, vomiting, diarrhea, distension, and abdominal cramp. The biggest concern in early feeding is that it might not be tolerated due to postoperative ileus, which can produce nausea, vomiting, and lack of appetite (Martindale, Maerz, 2006).

In general, studies indicated that early feeding and oral hydration have many advantages, including a shorter hospital stay (Schidler et al., 2016). In addition, there was a decrease in gastrointestinal morbidity (Frandina et al., 2016). Gut motility returns 4-24 hours in the small intestine, 24-48 hours in the stomach, and 48-72 hours in the colon after bowel surgery (Kraus, Fanning, 2016). The intestine is less likely to be considerably affected during most caesarean sections due to the limited manipulation of the gastrointestinal tract. Colonic stasis is increased after a CS (Wilson, 2016; Schilder et al., 2016).

Primiparous following a clinical pathway for caesarean section at Richmond Hospital (British Columbia, Canada) normally get clear fluid on a postoperative day one, a full fluid diet on postoperative day two, and regular food on postoperative day three. By eliminating the full fluid diet progression in October 2006, the

gynecologists/obstetricians agreed to minimize the time to start it, intending to start a regular diet within a few hours of surgery. At the time, this practice change was incorporated into the clinical pathway. Postoperative CS ileus is a common and clinically significant problem that can lead to significant postoperative morbidities, such as delaying enteral nutrition, patient discomfort, hospitalization lengthening, increased postoperative pain, poor wound healing, and an increased risk of other postoperative complications like pulmonary complications (Behm, Stollman, 2015).

Ileus is estimated to occur in around 50% of patients who undergo major abdominal surgery in the United States in 2009, with rates ranging from 6% to 20%. Additional morbidity was found to be caused by delays in the resolution of ileus (Bennett et al., 2010). Bowel rest, nasogastric tube decompression, intravenous fluids, correction of electrolyte imbalances, close observation, and withholding of nutritional provision postoperatively until the resumption of bowel function, as evidenced by the passage of flatus or first postoperative bowel motion, which in some cases might not occur. Generations of surgeons have advocated for this empirical regimen, believing that it not only speeds recovery from a CS, but also improves results by lowering the risk of problems like infection and anastomotic dehiscence (DSNSUH and LIJ, 2010).

The patient's continued immobility after a CS has several drawbacks such as impairment of pulmonary function, muscle atrophy, and the resulting orthostatic dysregulation set off a vicious cycle that keeps the patient in bed for an inordinate amount of time. On the other hand, early mobilization boosts intestinal function. Furthermore, it enables the patient to undertake everyday activities autonomously, resulting in not only a highly beneficial physiological but also a very positive psychological effect. Early mobilization, on the other hand, is only possible with good analgesia in the postoperative period (Richard, Steinbrook, 2005). The significant of oxygen saturation as a result of early mobilization minimizes post-CS wound problems and may have substantial clinical implications (Kehlet, 2016 & Marce et al., 2007 and Mynster et al., 2016).

Preoperative and postoperative physical nursing care is essentially the same as it is for any major abdominal surgery. Nursing interventions that ensure the patient's comfort, feeding, hydration, mobilization and promote sleep should be used. Post-CS problems such as shock and bleeding, infection, pneumonia should constantly be considered. In terms of bleeding, the nurse must be aware that vaginal bleeding is always a possibility, regardless of whether the operation was performed by abdominal route. Nursing care is primarily focused on preventing urine retention, intestinal distention, and thrombosis - issues that patients are particularly prone to developing - which is a primary nursing obligation (Eileen, 2016).

Significant of the study:

Cesarean section (CS), is one of the major abdominal surgeries that caries medical risks to woman's health including: hemorrhage, need for transfusion, injury to other organs, infections, anesthetic complications, and psychological impairments (Esteves-Pereira et al., 2017). Some studies have found that CS deliveries were associated with most cases of obstetric hemorrhage and emergency postpartum CS (Vogel et al., 2017 & Macfarlane et al., 2017). Furthermore, maternal mortality from CS is two to four times higher than that of vaginal birth (Esteves-Pereira et al., 2017).

These maternal deaths are mainly due to postpartum hemorrhage and anesthetic complications (Vogel et al., 2017 & Macfarlane et al., 2017). CS can be a life-saving intervention for both mother and newborn. The World Health Organization announced that no nation can justify having a CS rate higher than 10%–15%. Despite this advice, CS rates have increased to almost 25% in some countries in the last two decades (Esteves-Pereira et al., 2017). According to the most recent Egypt Demographic and Health Survey (EDHS) slightly more than half (52%) of the live births in the five years period before the 2017 EDHS were delivered by CS. While at Kafr El-Sheikh governorate, the CS rate was as high as 70.2% (Ministry of Health and Population [Egypt], 2017). Furthermore, Gupta and Saini (2018) reported that CS higher than 19% does not appear to improve maternal and neonatal health outcomes. In fact, CS is effective in saving maternal and neonatal lives only when it is carried out for medical indications. Gupta & Saini, 2018, Alshehri et al., (2019) and Biler et al., (2017), announced that CSs are associated with increased adhesions, blood transfusion, increased operation time, and length of hospitalization.

Multimodal approach application is an inter-disciplinary use of more than line of treatment. Oral fluids and food are traditionally introduced slowly after cesarean section (CS). Postoperative cesarean section (PCS) complications are broadly defined as a temporary impairment of gastrointestinal (GI) motility; it leads to patient discomfort, decreases the mobility, and prolongs convalescence and hospital stay (Esteves-Pereira et al., 2017).

Aim of the study:

The aim of the study was to examine the effect of multimodal approach application on the expected clinical outcomes of post cesarean section for primiparous women.

Operational Definitions:

Multimodal approach application is an inter-disciplinary use of more than line of treatment. Included:

1) Early postoperative oral fluid intake
2) Early postoperative nutritional intake
3) Mobilization of the patient
4) Using of non-steroidal anti-inflammatory analgesic drugs
5) Intravenous fluid administration

(Sabra and Booth et al., 2016).

Expected clinical outcomes of post-CS: Post-CS complications such as nausea, vomiting, pain, fever and delay in wound healing…. etc.

Study hypothesis:

Post cesarean section primiparous women who received the multimodal approach will exhibit an improvement in their clinical outcomes compared to the control group.

2. Subjects and method:

Research design:

A quasi-experimental research design (study/control group) was adopted in this study. It is a research design that involves the manipulation of independent variables similar to experimental research design. A quasi-experimental design (nonequivalent control group pretest/posttest) was adopted to test the proposed hypotheses. In this design, subjects are assigned to either intervention or control group. The baseline measures of the dependent variables were performed for all subjects. Then subjects in the intervention group only received the proposed intervention. After that, all subjects were post-tested to measure the degree of change in

the dependent variables **(LoBiondo-Wood & Haber, 2018) (Rajesh, 2017).**

Research setting:

The research was conducted at the inpatient obstetric and gynecology department and the operative room in Kafrelsheikh General Hospital, Kafrelsheikh Governorate, Egypt. The department consisted of 3 rooms; each of them includes six beds. It provided free services to women with different conditions such as; high- risk pregnancy, labor, and postpartum care.

Subjects:

A convenience sample of 80 pregnant women was recruited according to the following eligibility criteria: Primiparous women undergone elective CS, willing to participate in the study, and ages from 20- <40 years. The exclusion criteria were patients who had chronic disease, emergency CS, and restricted movement of lower limbs.

The sample size was calculated using the following formula:

Based on data from the literature ***(Sabra and Booth et al., 2016)***, considering a level of significant of 5%, and power of study of 80%, the sample size can be calculated using the following formula:

$n = [(Z_{\alpha/2} + Z_{\beta})^2 \times \{2(SD)^2\}]/$ (mean difference between the two groups)^2

Were

SD = standard deviation

$Z_{\alpha/2}$: This depends on level of significant, for 5% this is 1.96

Z_{β}: This depends on power, for 80% this is 0.84

Therefore,

$n= [(1.96 + 0.84)^2 \times \{2(17.0)^2\}]/ (10.7)^2=39.6$

Based on the above formula, the sample size required is 40 pregnant women in each group.

Reference: Sabra and Booth JL, Harris LC, Eisenach JC, Pan PH; 2016: A Randomized Controlled Trial Comparing Multimodal Techniques in Patients After Cesarean Delivery. *Anesth Analg*. 122(4):1114-9.

Tools of data collection:

Data pertinent to the study were collected using three tools. They were structured interview schedule, Analogue scale, Multimodal approach assessment record, and clinical outcomes assessment record.

I- Structured Interview schedule:

This tool was constructed by the researcher to assess:

a- Socio-demographic data: such as age, level of education, residence, occupation

b- Obstetric and clinical data such as gestational age per week, type of anesthesia, indication of CS, and surgical type.

II- Post-CS Analogue scale:

This tool was adapted **from (Campbell, 1995)** for pain severity assessment post-CS, **the Numeric Pain Scale** is a 10-point scale. The scale consists of a line divided by numbered points from 0 to 10. Pain scores were as follows: 0 indicates (no pain), less than 3 illustrates (mild) 3-5 indicates (moderate), 5-8 illustrates (severe), more than 8 indicates uncontrollable and worst.

III- Clinical outcomes assessment record:

This tool was constructed by the researcher after literature review to examine: Post-CS complications (pain, nausea, vomiting, fever and delay in wound healing…. etc)., paralytic CS symptoms, a mean time interval of intestinal

function and mean length of hospital stay, time of post-CS I.V line disconnection, time of first hydration, time of first nutritional intake, first time of ambulation, duration of mobility/ day, characters of activities performed, post-CS analgesia, a dose of analgesia (mg), time of analgesia, post-CS pain intensity, duration of surgery, resolution of post- CS ileus and scar healing duration.

Validity and Reliability:

The tools constructed by the researchers were submitted to five scholastic nursing specialists in the field of maternity nursing to test their content validity. Modifications were carried out according to their recommendations. Tools validated for clarity, appropriateness, and completeness of their content.

The reliability of the proposed tools was tested using Cronbach's alpha coefficient test. For the structured interview schedule, Cronbach's alpha of 0.80 showed a strong, significant positive correlation between the tool's items. While for the clinical outcomes assessment record, it was 0.84, which indicates accepted tool's reliability and for the Analogue scale was 0.95. **(Campbell, 1995).**

Procedures:

Administrative design:

Official permission was obtained from the study setting director (Kafrelsheikh General Hospital administration).

Ethical consideration:

Each participant was informed about the purpose of the study and its importance. The researchers emphasized that participation in this study is entirely voluntary, and all women informed that they could withdraw from it at any time. Anonymity and confidentiality were assured through coding the data. Informed oral consent was obtained from a woman who accepts to be included in the study.

Pilot study:

It was conducted on 10% of the sample (8 patients) who met the criteria of selection to assess the feasibility of the study process, clarity of the tools, and to determine the needed time to complete the tools. The needed modifications were performed, and those subjects were excluded from the study. Data was collected through a period of the first of July 2021 to the last of September 2021. The research was conducted through four phases: Preparation, recruitment, assessment, and implementation.

Preparation phase:

During this phase, updated review of the related literature has been done to construct the data collection tools. Data was collected through a period of 2 months from the period of the first of July 2021 to the last of September 2021. Each participant was interviewed individually to keep her privacy and prevent contamination of the result where the researcher firstly explained the purpose and nature of the study to obtain informed consent.

Multimodal approach should be prepared as follow:

It included items to assess a variety of modalities important to be applied post –CS as follows:

1) Early postoperative oral fluid intake >800 ml beginning 2 hours postoperative rich with chloride CHL (water, juice and tea).
2) Early postoperative nutritional intake beginning not more than 4 hours postoperative with protein-enriched high caloric supplementations until normal diet intake (yogurt and milk).

3) Mobilization of the patient as early as possible after 2 hours postoperative for more than 2 hours at the first 24 hrs. Classified into independent (without any help), partially independent (with some help) and complete dependent (with complete help like well chair).

4) Using of non-steroidal anti-inflammatory analgesic medication (paracetamol orally up to 4 gm daily) if needed as doctors order and under their supervision of him.

5) Intravenous fluid administration is continued till adequate fluid intake as doctor order and under supervision of him **(Sabra and Booth et al., 2016)**.

Recruitment phase:

A convenience sample was taken then women who had undergone elective CS were randomly assigned using the sealed envelopes technique into the study group and control group.

Assessment phase:

After enrollment, the researcher holds a meeting with each pregnant woman to complete the three data collection tools individually. The questions were asked in Arabic, and the researchers signed the woman's responses. The time taken to complete the tools was about fifteen to twenty minutes, and the needed time to complete this phase was 2 months. Then, women were classified according to the result. A Structured Interview Schedule was used by the researchers to obtain the studied women's socio-demographic, obstetric & clinical data.

Implementation phase:

Related to the outcome of interest and based on the result of the assessment phase: The researcher conducted a face-to-face interview for hospitalized woman. After that, multimodal approach was applied by the researcher to assess the studied women clinical outcomes post- CS through using the analogue scale and clinical outcomes assessment records. The multimodal approach provided only to the study group included beginning of early postoperative oral fluid intake >800 ml beginning 2 hours postoperative rich with chloride CHL (water, juice and tea), early postoperative nutritional intake beginning not more than 4 hours postoperative with protein-enriched high caloric supplementations until normal diet intake (yogurt and milk), mobilization of the patient as early as possible after 2 hours postoperative for more than 2 hours at the first 24 hrs, using of non-steroidal anti-inflammatory analgesic drugs (paracetamol orally up to 4 gm daily) if needed as doctor order and his supervision. Patients' classification into independent (without any help), and intravenous fluid administration is continued till adequate fluid intake as physician order and under his supervision. Characters of activities performed for study and control group consisted of independent, partially independent (with some help), and complete dependent (with complete help like wheel chair). While the control group follow the routine care of hospital.

Outcome assessment phase:

The effect of the multimodal approach application on the expected clinical outcomes of post-CS for primiparous women was examined. The researcher conducted a telephone interview if the woman was discharged from the hospital for follows up of outcome (about 4 weeks).

Limitation of the study:

The study sample was nominated from a single setting, so a generalization of the findings could not be accessible.

Statistical analysis:

All statistical analyses were performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). Continuous data were expressed in mean ±standard deviation (SD) while categorical data were expressed in number and percentage. The Student's t test was used for comparison between two for variables with continuous data. Chi-square test was used for comparison of variables with categorical data. Correlation co-efficient test was used to test for correlations between two variables with continuous data. Statistical significant was set at $p<0.05$.

3. Results:

Eighty women aged from 20-≥40 years undergone elective CS were recruited in the current study according to inclusion and exclusion criteria. Result findings of the current research are presented in four tables and three figures each one describing the study factors.

Table (I) shows that there were no statistically significant differences according to Socio demographic characteristics for study and control group in variables (age, residence, education, occupation), the highest p-value was (0.866) of the variable age and mean value was (34.2) of age for the study group with standard deviation (9.0) and mean value (33.8) of age for the control group with standard deviation (8.7).

Table (II) represents that there were no statistically significant differences according to obstetric and clinical characterstics of study and control group related to (gestational age, type of anesthesia, indication for CS, the highest p-value was (1.000) of the type of anesthesia, p-value was (0.866) of the gestational age and mean value was (38.8) of gestational age for the study group with standard deviation (1.9) and mean value (40.0) of gestational age for the control group with standard deviation (1.8). And there were statistical significant differences for the type of surgery since chi-square p-value was less than 0.001.

Table (III) and figure (I,II and III) illustrate that there were statistically significant differences according to clinical outcomes for study and control group related to " post-CS complications" consisted of (fever, shock, bleeding, thrombophelibitis, urinary retention, wound infection, pneumonia, constipation and others) Since the value of chi-square was less than 0.05, the highest p-value was (0.045) related to fever, shock, followed by p-value (0.043) of pneumonia and the lowest p-value was (0.022) regarding thrombophelibitis. Also, there were statistically significant differences according to clinical outcomes for study and control group in paralytic symptoms" consisted of (nausea, vomiting, diarrhea, distension and abdominal cramp), p-values were (0.039), (0.026) and (0.022) respectively related to abdominal cramp, vomiting and nausea. Also , there were statistically significant differences according to clinical outcomes for study and control group in mean time of intestinal functions" consisted of (bowel sound, flatus, intestinal movement and first meal ingestion), the highest p-value was (0.045) of flatus while, mean value was (3.9) with SD (1.1) of flatus for the study group while the mean value was (4.7) with SD (1.1) for the control group and there were differences between the means of flatus between the control and study group (chi-square = 0.045), followed by bowel sound, and the lowest p-value was (0.002) for the first meal ingestion (mean value was 1.5, SD 0.8 versus 2.2, SD 1.1) respectively for the study and control group. Added that, there were statistically significant differences according to clinical outcomes for study and control group regarding "Mean of length of hospital stay/day with mean value (2.6) and standard deviation (0.9)

for the study group while the mean value was (3.1) with standard deviation (0.7) for the control group" since the value of chi-square was (0.007).

Results of **table (IVa)** show that there were statistically significant differences according to time of post CS I.V line disconnection/ hrs consisted of (2 hrs, 4 hrs, 6 hrs, 8 hrs, More) since the p-value of chi-square was (0.019), the "mean time of post CS I.V line disconnection/ hrs" was (5.2) with SD (1.9) and (6.4) with SD (2.4) for the study and control group respectively. Also, " mean time of first hydration/ hrs " was (2.3) with SD (1.0) and (5.8) with SD (1.8), there were statistical significant differences according to time of first hydration/ hrs consisted of (2 hrs, 4 hrs, 6 hrs and more) for study and control group respectively, since p-value of chi-square less than 0.001. Added, there were statistically significant differences according to time of first nutritional intake/ hrs for study and control group respectively consisted of (4 hrs, 6 hrs, 8 hrs, more) " time of first nutritional intake/ hrs " was (1.5) with SD (0.8) versus (2.2) with SD (1.1), since the p-value was less than 0.001, as well as there were differences between the " mean of time of first nutritional intake/ hrs " between the control and the study group, p-value was (0.002). Also, there were statistically significant differences according to first time of ambulation/ hrs for study and control group respectively consists of (2 hrs, 4 hrs, 6 hrs, 8 hrs, more) that was (2.7) with SD (1.3) versus (4.1) with SD (2.0), since p-value (0.02), As well as, there were statistically significant differences according to duration of mobility per day/ hrs for study and control group respectively consisted of (3 hrs, 4 hrs, more) that was (3.1) with SD (0.2) versus (3.5) with SD (0.9), since the p-value (0.031).

Results of chi square test from **table (IVb)** show that there were statistically significant differences according to post CS analgesia consisting of (paracetamol, other drugs). The percentage of paracetamol usage was (95%), versus (5%) in the study and control group respectively. There were statistically significant differences according to route of analgesia consisted of (oral, I.M), as well as dose of analgesia/mg consisted of (under 100 mg, 100 mg, 200 mg, 300 mg, more) since the p-value was less than 0.001. Added, there were statistically significant differences according to post-CS pain intensity consisted of (mild, moderate, severe) since the p-value was less than (0.026) . As well as, there were statistically significant differences according to duration of surgery/hrs consisted of (2 hrs., 4 hrs, 6 hrs, 8 hrs) since the p-value was (0.007), and " Mean duration of surgery/hrs " for the study group was (46.0) with SD (2.2), and for the control group was (6.2) with SD (1.9), there were differences between the " mean duration of surgery/hrs " between the control and the study group. And, there were statistically significant differences according to resolution of post CS ileus consisted of (Occur, Not occur) , p-value was (0.025), the percentage of occur in the study group was (90%), while in the control group was (70%) and not occur in the study group was (10%), while in the control group it was (30%). Also, there were statistically significant differences according to scar healing duration/ week consists of (6 weeks, 8 weeks, More). And, there were statistically significant differences according to " mean scar healing duration/ week " for the study group which was (78.0) with SD (1.7) versus the control group which was (8.7) with SD (1.5).

Table (I): Distribution of the study and control groups according to their socio demographic characteristics

Socio - characteristics	Study group (N=40)		Control group (N =40)		P- value & Significant
	no	%	no	%	
Age/years					
20 - <30 years	16	40	14	35	0.866
30 - <40 years	12	30	14	35	
≥40 years	12	30	12	30	
Mean ±SD	34.2 ±9.0		33.8 ±8.7		0.831
Residence					
Rural	16	40	18	45	0.651
Urban	24	60	22	55	
Education					
Illiterate	3	7.5	4	10	0.150
Read & write	6	15	6	15	
Primary	8	20	2	5	
Secondary	15	37.5	12	30	
University	8	20	16	40	
Occupation					
Employer	18	45	24	60	0.179
Housewife	22	55	16	40	

Table (II): Distribution of the study and control groups according to their obstetric and clinical characterstics

Cinical characterstics	Study group (N=40)		Control group (N =40)		P- value& Significant
	no	%	no	%	
Gestational age/ weeks					
37 - <40	16	40	14	35	0.866
40 - <42	12	30	14	35	
≥ 42	12	30	12	30	
Mean ±SD	38.8 ±1.9		40.0 ±1.8		0.673
Type of anesthesia					
General	22	55	22	55	1.000
Regional	18	45	18	45	
Indication for CS					
Malpresentations	8	20	4	10	0.282
Twin pregnancy	20	50	16	40	
Maternal medical conditions	8	20	14	35	
Other	4	10	6	15	
Type of surgery					
Transverse cut	38	95	4	10	<0.001(*)
Classical cut	2	0.5	36	90	

(*)= significant

Table (III): Distribution of the study and control groups according to their clinical outcomes

Clinical outcomes	Study group (N=40)		Control group (N =40)		P- value& Significant
Post-CS omplications	**no**	**%**	**no**	**%**	
Fever (more than38c^0)	4	10	11	27.5	0.045(*)
Shock	4	10	11	27.5	0.045(*)
Bleeding	6	15	14	35	0.039(*)
Thrombophelibitis	6	15	15	37.5	0.22(*)
Urinary retention	5	12.5	13	32.5	0.032(*)
Wound infection	8	20	17	42.5	0.030(*)
Pneumonia	2	5	8	20	0.043(*)
Constipation	3	7.5	10	25	0.039(*)
Others	4	10	11	27.5	0.045(*)
Paralytic symptoms:					
Nausea	6	15	15	37.5	0.22(*)
Vomiting	7	17.5	16	40	0.026(*)
Diarrhea	4	10	12	30	0.025(*)
Distension	2	5	9	22.5	0.023(*)
Abdominal cramp	3	7.5	10	25	0.039(*)
Mean time of intestinal functions					
Bowel sound/hrs.	3.7 ±1.2		4.3 ±1.2		0.028 (*)
Flatus/hrs.	3.9 ±1.1		4.7 ±1.1		0.045 (*)
Intestinal movement/hrs.	3.6 ±1.1		4.2 ±1.2		0.022 (*)
First meal ingestion/hrs.	1.5 ±0.8		2.2 ±1.1		0.002 (*)
Mean of length of hospital stay/day	2.6 ±0.9		3.1 ±0.7		0.007 (*)

(*)= significant

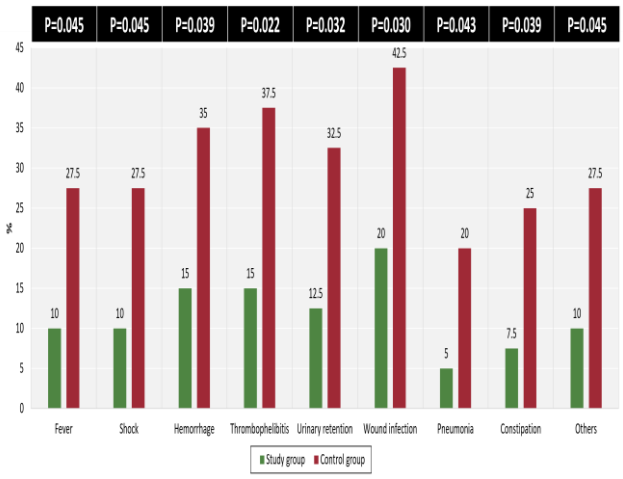

Figure 1: Comparison of the freqeuncy of post CS complications between study group and control group

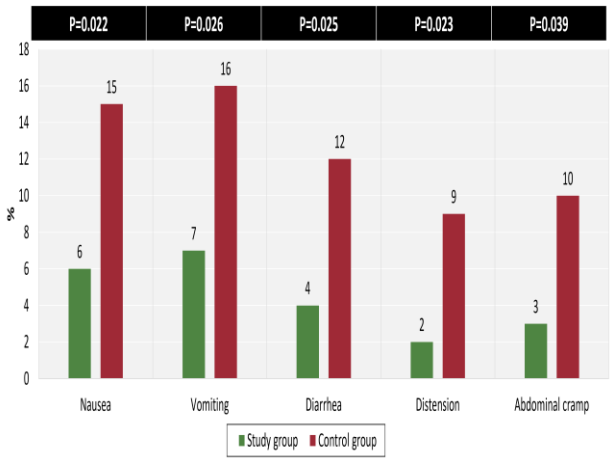

Figure 2: Comparison of the freqeuncy of paralytic symptoms between study group and control group

Figure 3: Comparison of the time intervals of intestinal functions between study group and control group

Table (IVa): Distribution of the study and control groups according to their clinical postoperative outcomes

Items	Study group (N=40)		Control group (N=40)		P-value & Significant
Time of post-CS I.V line disconnection/ hrs.	**no**	**%**	**no**	**%**	
2 hrs.	6	15	2	5	0.019(*)
4 hrs.	10	25	12	30	
6 hrs.	18	45	10	25	
8 hrs.	6	15	9	22.5	
More	0	0	7	17.5	
Mean time of post-CS I.V line disconnection/ hrs.	5.2 ±1.9		6.4 ±2.4		0.015(*)
Time of first hydration/ hrs.					
2 hrs.	36	90	2	5	<0.001(*)
4 hrs.	2	5	12	30	
6 hrs.	2	5	14	35	
More	0	0	12	30	
Mean time of first hydration/ hrs.	2.3 ±1.0		5.8 ±1.8		<0.001 (*)
Time of first nutritional intake/ hrs.					
4 hrs.	36	90	2	5	<0.001(*)
6 hrs.	2	5	12	30	
8 hrs.	0	0	14	35	
More	2	5	12	30	
Mean of time of first nutritional intake/ hrs.	1.5 ±0.8		2.2 ±1.1		0.002(*)
First time of ambulation/ hrs.					
2 hrs.	30	75	20	50	0.020(*)
4/ hrs.	6	15	10	25	
6 hrs.	4	10	2	5	
8 hrs.	0	4	4	10	
More	0	0	4	10	
Mean of First time of ambulation/ hrs.	2.7 ±1.3		4.1 ±2.0		0.005(*)
Duration of mobility per day/ hrs.					
3 hrs.	38	95	30	75	0.031(*)
4 hrs.	2	5	6	15	
More	0	0	4	10	
Mean duration of mobility/ hrs.	3.1 ±0.2		3.5 ±0.9		0.010(*)
Characters of activities performed					
Independent	28	70	24	60	0.011(*)
Partially independent	12	30	8	20	
Complete dependent	0	0	8	20	

(*)= significant

Table (IVb): Continue.

Items	Study group (N=40)		Control group (N=40)		p-value& Significant
Post CS analgesia	**no**	**%**	**no**	**%**	
Paracetamol	38	95	2	5	<0.001(*)
Other drugs	2	5	38	95	
Route of analgesia					
Oral	40	100	2	5	<0.001(*)
I.M	0	0	38	95	
Dose of analgesia/mg					
Under 100 mg	32	80	2	5	<0.001(*)
100 mg	4	10	34	85	
200 mg	2	5	2	5	
300 mg	2	5	2	5	
More	0	0	2	5	
Mean Dose of analgesia/mg	75.0 ±63.0		127.5 ±80.8		0.002(*)
Time of analgesia/ hrs.					
Immediate	28	70	34	85	0.037(*)
Half hrs.	6	15	6	15	
One hrs.	6	15	0	0	
Mean of time of analgesia /hrs.	24.0 ±16.1		17.3 ±5.4		0.015(*)
Post-CS pain intensity					
Mild	14	35	4	10	0.026(*)
Moderate	16	40	24	60	
Severe	10	25	12	30	
Duration of surgery/hrs.					

2 hrs.	12	30	2	5	0.007(*)
4 hrs.	12	30	12	30	
6 hrs.	8	20	14	35	
8 hrs.	8	20	18	45	
Mean duration of surgery/hrs.	4.6 ±2.2		6.2 ±1.9		<0.001(*)
Resolution of post-CS ileus:					
Occur	36	90	28	70	0.025(*)
Not occur	4	10	12	30	
Scar healing duration/ week					
6 weeks	16	40	6	15	0.035(*)
8 weeks	12	30	14	35	
More	12	30	20	50	
Mean scar healing duration/ week	7.8 ±1.7		8.7 ±1.5		0.013(*)

(*)= significant

4: Discussion:

Eighty women aged from 20->40 years undergone elective CS were recruited in the study according to inclusion and exclusion criteria. Results of chi square test from **table (I)** showed that there are no statistically significant differences according to socio-demographic characteristics for study and control group in variables (age, residence, education, occupation). **Table (II)** shows that there were no statistically significant differences according to obstetric and clinical characterstics of study and control group in variables (gestational age, type of anesthesia and indication for CS).

The current study aimed to examine the effect of multimodal approach application on the expected clinical outcomes of PCS for primiparous women. The following research hypotheses were formulated and tested to achieve this aim: Post cesarean section primiparous women who received the multimodal approach will exhibit an improvement in their clinical outcomes compared to the control group. So, a discussion of the findings will be presented in order to scrutinize these hypotheses.

The postoperative dietary therapy of caesarean section patients historically has the transition from clear fluids to a regular diet, with the early feed group reporting slightly fewer gastrointestinal issues that parallel with the current study findings **(Steed et al 2016).**

According to **MacMillan et al. (2016), Steed et al (2016), Flesher et al., (2008), and Soriano et al., (2016)**, in quasi experimental study, 80 postoperative CS in USA, eating foods early postoperatively may increase bowel movements and peristalsis, lowering nausea and vomiting. The study and control groups exhibited no significant differences in early feeding of a regular meal and bowel movements and peristalsis following caesarean section. There was no significant difference in bowl function or average length of hospital stay between the two groups, but the time of first postoperative bowel movement was faster in the early feed group. Early postoperative feeding progression after CS was well tolerated and had no negative consequences in patients.

In contrast to the previous study, there was a significant difference in length of hospital stay, nausea & vomiting and bowl function as well as the time of first postoperative bowel movement between the study and control group in the current study according to table 2, figure 2 & 3. The disparity between studies (previous and current study) could be due to that; the research sample could also be different across studies; inconsistencies could be in the sample's inclusion and exclusion criteria. According to the previous study, the time of post-CS intestinal motility differed between the study and control groups. The length of time spent in the hospital differed significantly between the two groups. Within this comparison group of 80 patients, the tolerance of an earlier regular diet was seen.

Although 17.5 versus 40% of the study and control groups, respectively, suffered postoperative

vomiting. In comparison to the control feed group, which got first meal ingestion after 2.2 hours, the early feed group showed improved tolerance of a regular diet and first meal ingestion after one and a half hours postoperatively. The study and control groups experienced first hydration at 2.3 and 5.8 hours, respectively. There were substantial differences between groups in terms of initial oral hydration and paralytic symptoms. According to table III & IVa in the current study, the mean time of intravenous disconnection as well as the first hydration time after caesarean section differed significantly between the study and control group, with 5.2 hours versus 6.4 hours, respectively.

The adoption of a multimodal technique has a number of advantages for both patient and the health-care system. According to table 3, figure 3, the current study found that, women in the study group had faster recovery of bowel function, with significantly shorter mean postoperative time intervals for bowel sounds, which reflected (3.7 hours versus 4.3 hours), passing of flatus, than women in the control group (3.9 hours versus 4.7 hours). In contrast to **Soriano et al., (2016)**, with quasi experimental study, 221 postoperative CS in UK, the current findings was unexpected. They found no significant increase in gastrointestinal morbidity in a prospective analysis of 221 patients to assess gastrointestinal function and patient acceptance of early oral feeding following caesarean delivery. The difference between studies (prior and present study) could be due to the fact that the study sample was selected from a single environment, resulting in a sample size that was insufficient to generalize bowel movements and peristalsis results. It could also be due to differences in sample inclusion and exclusion criteria. In the late 1990s, two prospective randomized trials **(Schilder et al., 2016)** randomized 96 patients to either early post caesarean section feeding or the standard postoperative feeding protocol after major gynecologic surgery **(Schilder et al., 2016).** Although there was a large rise in emesis (about 40%), there was no increase in aspiration pneumonia, wound dehiscence, or intestinal leakage during early postoperative eating, the hospital stay was four to three days, this report was nearly in agreement with the current study who reported that, there were statistically significant differences according to clinical outcomes for the study and control group in variable post-CS complications, the highest p-value was (0.045) of fever and shock, followed by p-value (0.043) of pneumonia, the lowest p-value was (0.022) of thrombophelibitis according to table 3 & figure 1.

A comparable trial of early feeding was conducted by **Pearl et al. (2016), & Schilder et al trial. 's (2016)**, 40 postoperative USA primiparous in undergoing CS. After early feeding and oral fluids, **Pearl et al. (2016)** in quasi experimental study found a considerable incidence of nausea and vomiting (49 %). On the other hand, early feeding and oral fluids had no obvious effect on aspiration pneumonia, wound dehiscence, or intestinal leakage, and the hospital stay was five to six days. Thus, despite severe vomiting, early feeding after major abdominal gynecologic surgery does not increase pneumonia, dehiscence, or anastomotic leaks, and lowers hospital stay by approximately one day. The earlier study was in contrast with the current study. It's possible that the discrimination across studies (prior and present) is attributable to the fact that the study sample is practically not identical, and there are different inclusion criteria for the sample according to table 3 & figure 1.

A meta-analysis looked at 130 Sues Africa pregnant women who were randomly assigned to enteral or parenteral postoperative nutrition **(Flesher and colleagues, 2008).** Early feeding and oral hydration reduced postoperative septic squeal, according to findings from this meta-analysis. The effect was a reduction in pneumonia and sepsis in patients who needed to stay in the critical care unit for an extended period of time. There is no scientific evidence that early postoperative eating following CS has any medical benefits. According to table 3 & figure 1, the earlier findings were substantially identical to the current research. Because of the concordance between the current and prior studies, it is unlikely postoperatively CS those 2 to 3 days without food would cause severe gastrointestinal atrophy, resulting in delayed wound healing or infection in a healthy gynecologic patient.

Barnes et al. (2016) & Fanning et al. (2016) investigated 15 UK women after caesarean section in a prospective non-randomized experiment. The internal sphincter relaxation of all individuals was altered, with increased distention required to trigger relaxation and decreased rectal sensation. Found that the median clinical restoration of normal bowel function following caesarean section took 3 weeks in a prospective nonrandomized experiment. It has been found that bowel stimulation after caesarean section is preferable than waiting for the spontaneous resolution of rectal stasis following caesarean surgery.

Fanning and **Yu-Brekke, (2016),** in quasi experimental study, 30 postoperative CS in US, used 30 mL of milk of magnesia orally twice in the first study. Patients were started on a clear liquid diet after regaining bowel function and were discharged from the hospital 12 hours after tolerating the diet. There were no cases of vomiting, aspiration pneumonia, or ileus in any of the patients with intensive postoperative bowel stimulation; hospital stay was reduced from 8 to 4 days, compared to earlier studies utilizing the traditional postoperative feeding strategy. On the first postoperative day after a radical caesarean section, 15 to 20 patients were given 45 mL of Fleet Phospho-Soda orally and a clear liquid diet in a second prospective nonrandomized experiment. There were no cases of vomiting, aspiration pneumonia, or caesarean delivery in any of the patients. After a caesarean section, it is thought that postoperative bowel stimulation may be beneficial, so early eating and oral hydration may be beneficial in the current study. It's possible that the parallels between previous and current studies are attributable to identical practical and inclusion criteria of the sample.

In quasi experimental study, 50 postoperative CS in China, Patients need postoperative analgesia to recuperate quickly following major abdominal surgery. Analgesic medications (paracetamol, non-steroid anti-inflammatory medicines, etc.) are among the options. Local aesthetics with paracetamol as a systemic aesthetic is available. Paracetamol has been shown in randomized clinical trials to minimize postoperative morbidity and hospital stay, as well as improve recovery **(Kraus, Fanning, 2016).**

According to a Cochrane Institute meta-analysis, paracetamol also decreases or even prevents the use of systemic opioids, provides great postoperative analgesia, and minimize s or even prevents postoperative ileus, pain intensity and healing scar which were reported (6 weeks). These findings were supported in a more recent meta-analysis by Ballantyne et al., 2016. Paracetamol was given alone to the study group. In the current study,

Paracetamol analgesics were the most commonly used analgesic in the study group (40 versus 60 percent related to moderate pain in the study and control groups, respectively) according to table IVb. Analgesics decreased hospital stays and complications after a caesarean surgery. In the current study, there were statistically significant differences according to post CS pain intensity related to paracetamol. Also there were statistically significant differences according to resolution of post-CS ileus as well as scar healing duration/ week, that supported by **(Kraus, Fanning, 2016)**.

In a previous comparative studies by **Kehlet, 2016** & **Mynster et al., 2016** in quasi experimental study, 60 postoperative CS in Turkey, it was discovered that immobilizing the patient during the post-CS period has a number of drawbacks. The significant of oxygen saturation as a result of early mobilization. Secondarily, **Kehlet (2016)** may have clinical implications by lowering post-CS wound problems. This was parallel with the current study which reported that, patients in the study group were mobilized after two hours, which reduced post-CS expected clinical outcomes. In the current study, there were statistically significant differences according to the duration of mobility per day/ hrs for the study and control group also, there were statistically significant differences according to characters of activities performed for study and control group consisted of (independent, partially independent, complete dependent) since the p-value was (0.011) according to table IVa. The virtual resemblance between studies (prior and present study) could be due to the fact that the studies are closely practically identical.

The study group had a larger percentage of expected clinical outcomes resolved after CS than the control group. In terms of expected clinical outcomes and multimodal use, there are considerable statistical differences between the two groups.

5.Conclusion:

Based on the findings of the present study; it was concluded that, post-CS primiparous women who received multimodal approach exhibited an improvement in their clinical outcomes compared to the control group. A multimodal approach resulted in reducing their nausea, vomiting, wound infection, length of hospital stay, as well as duration of scar healing. Consequently, the research findings supported the study hypotheses and achieved the study aim.

6. Recommendations:

The multimodal approach should be applied to women post-CS to improve their clinical outcomes. More studies should be carried out on a larger sample about in-service teaching program related to multimodal approach in major gynecological surgeries.

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7. References :

Barnes W, Waggoner S, Delgado G, Maher K, Potkul R, Barter J ; 2016: Manometric characterization of rectal dysfunction following radical CS. Gynecol Oncol. 1 (41):116-9.

Ballantyne C, Carr B, Ferranti S; 2016: The comparative effects of postoperative analgesic therapies on pulmonary outcome: Cumulative meta-analysis of randomized, controlled trials. Anaesth Analog. 3(1): 598–612.

Behm B, Stollman N; 2015: Postoperative Ileus: Etiologies and Interventions, American Gastroenterological Association, Clinical Gastroenterology and Hepatology. 3(1):1542-3565.

Bennett C, Conway G, Macpherson J, Jacobs P, and Murray A; 2010: Intermediate sized CGG repeats are not a common cause of idiopathic premature ovarian failure. Human Reproduction. 3(1):1335–8.

Campbell C. Pain intensity scales (the numeric pain scale used at this study), (from US department of health and human services. Clinical practice guide line- publication; 1995: 92- 0032.

Cutillo G, Maneschi F, Franchi M, Giannice R, Scambia G, Benedetti-Panici P; 2016: Early feeding compared with nasogastric decompression after major gynecologic surgery: A randomized study. Obstet Gynecol. 93(1):41-5.

Department of Surgery at North Shore University Hospital and Long Island Jewish Medical Center DSNSUH and LIJ; 2010: North Shore-LIJ Health System, Geriatric Surgery.

Esteves-Pereira P, Deneux-Tharaux, C, Nakamura-Pereira M, Saucedo M, Bouvier-Colle H& Leal C; 2017: Caesarean delivery and postpartum maternal mortality: a population-based case control study in Brazil. PloS one. 11(4): 153-396.

Fanning J, Andrew S; 2015: Early postoperative feeding after major gynecologic surgery: Evidence-based scientific medicine. Am J Obstet Gynecol. 1 (1) :1-4.

Fanning J, Hilgers R, Murray K; 2016: Surgical stapling technique for radical CS. J Pelvic Surg. 3(1): 73-78.

Fanning J, Yu-Brekke S; 2016: Prospective trial of aggressive postoperative bowel stimulation following radical CS. Gynecol Oncol. 1 (1) 412-4.

Flesher M, Wagner B, Jones L; 2008: Early Feeding After a CS. Online J Health Allied Scs., 7(4):2-12.

Flesher M, Wagner B, Jones L; 2008: Early Feeding After a CS. Online J Health Allied Scs. 7(4):2-8.

Ghosh K, Downs L, Padilla L, Murray K, Twiggs L, Letourneau C, Carson L; 2015: The implementation of critical pathways in gynecologic oncology in a managed care setting: A cost analysis. Gynecol Oncol. 83(2):378-82.

Gupta, M and Saini, V; 2019: Caesarean Section Morbidity. JCDR. 12(9):2-6.

Johnson C, Casto C, Krammer J, Drake J; 2016:Postoperative feeding: A clinical review. Obstet Gynecol Surv. 55(9):571-3.

Jorgensen H, Wetterslev J, Moiniche S,Dahl JB; 2016 : Epidural local anaesthetics versus opioid-based analgesic regimens on postoperative gastrointestinal paralysis, PONV and pain after abdominal surgery. Cochrane Database Syst Rev.

Junger M & Schoenberg M; 2007: Authors Journal Compilation. LMS Group. Transfusion Alternatives in Transfusion Medicine. 1 (5): 300-7.

Kaboli P, Henderson M; 2015: White R. DVT prophylaxis and anticoagulation in the surgical patient. Med Clin North Am. 3(1): 77–110.

Kathryn A, Amos H, Chitra L, Cynthia N, Jennifer S; 2019: Recommendations for selection of self-report pain intensity measures in children and adolescents: a systematic review and quality assessment of measurement properties. PAIN. 160 (1) :5-18.

Kehlet H; 2016: Multimodal approach to control postoperative pathophysiology and rehabilitation. Br J Anaesth. 3(4): 606–17.

Kraus K, Fanning J; 2016: Prospective trial of early feeding and bowel stimulation following radical CS. Am J Obstet Gynecol. 3(1): 996-8.

Kraus K, Fanning J; 2016: Prospective trial of early feeding and bowel stimulation after radical CS. Am J Obstet Gynecol. 182(5):996-8.

MacMillan S, Kammerer-Doak D, Rogers R, Parker K; 2016: Early feeding and the incidence of gastrointestinal symptoms after major gynecologic surgery. Obstet Gynecol. 96(4):604.

Martindale R, Maerz L; 2006: Management of perioperative nutrition support. Curr Opin Crit Care. 12 (4):290-4.

McLaughlin E; 2016: Nursing care in CS: Prevention of urinary retention, abdominal distention, and thrombosis is a major nursing responsibility. Am J Nurs. 50(5):295-8.

Michael L; 2016:Meta-Analysis of Selective Versus Routine Nasogastric Decompression After Elective Laparotomy. Annals of Surgery. 3 (1):469-78.

Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], ICF International. Egypt Demographic and Health Survey. Cairo, Egypt and Rockville, Maryland, USA: Ministry of Health and Population and ICF International; 2017.

Moore F, Feliciano D, Andrassy R, McArdle A, Booth F, Morgenstein-Wagner T, et al; 2016: Early enteral feeding, compared with parenteral, reduces postoperative septic complications. Ann Surg. 1 (1):173-83.

Mynster T, Gensen L, Gensen F, Kehlet H, Rosenberg J; 2016:The effect of posture on late post CS oxygenation. Anathesia, 1 (1) 51:225-7.

Pearl M, Frandina M, Mahler L, Valea F, Di Silvestro P, Chalas E ; 2016:Randomized controlled trial of a regular diet as the first meal in gynecologic oncology patients undergoing intra-abdominal surgery. Obstet Gynecol. 1 (4) 230-34.

Pearl M, Valea F, Fischer M, Chalas E; 2016:A randomized controlled trial of postoperative naso gastric tube decompression in gynecologic oncology patients undergoing intra-abdominal surgery. Obstet Gynecol. 1 (5):399-402.

Phillips B, Ball C, Sackett D. Levels of Evidence and Grades of Recommendation; 2015: Accessed at: http://www.cebm.net; Center of Evidence-Based Medicine; Oxford.

Rosenberg J; 2016: Hypoxia in the general surgical ward-a potential risk factor? Eur Surg. 1 (1): 657-61.

Sabra A, and Booth JL, Harris LC, Eisenach JC, Pan PH; 2016: A Randomized Controlled Trial Comparing Multimodal Techniques in Patients After Cesarean Delivery. Anesth Analg.122(4):1114-9.

Schidler M, Hurteau A, Look Y, Moore H, Raff G, Stehman B, Sutton P; 2016: A prospective controlled trial of early postoperative oral intake following major abdominal gynecologic surgery. Gynecol Oncol. 67(3):235-40.

Schilder M, Hurteau A, Look Y, Moore H, Raff G, Stehman B; 2016: A prospective controlled trial of early postoperative. Oral intake following major abdominal gynecologic surgery. Gynecol Oncol. 1 (2):235-40.

Soriano D, Dulitzki M, Keider N; 2016: Early oral feeding after Caesarean delivery. Obstet Gynecol. 3(1):87: 106.

Steed H, Capstick V, Flood C, Shepansky A, Schulz J, Mayes D; 2016: A randomized controlled trial of early versus "traditional" postoperative oral intake after major abdominal gynecologic surgery. Am J Obstet Gynecol. 186(5):861-865.

Steinbrook R; 2005: Postoperative Ileus; Why We Should Treat, The continuing challenges of post CS ileus, Supplement to Contemporary Surgery. 5 (4): 4-7.

Vogel P, Betrán P, Vindevoghel N, Souza P, Torloni R., Zhang J & WHO; 2017: Multi-Country Survey on Maternal and Newborn Health Research Network. Use of the Robson classification to assess caesarean section trends in 21 countries: a secondary analysis of two WHO multicountry surveys. Lancet Glob Health. 3 (5): 689-92.

Woods H, Erickson W, Condon E, Schulte J, Sillin F; 2016: Postoperative ileus: a colonic problem? Surgery. 3 (1): 527-33.

Wu L, Griffith P; 2005: Early postoperative feeding and abdominal gynecological surgery. Br J Nurs. 14(1):42-46.