Effect of a Clinical Pathway Intervention on knowledge and Satisfaction of Women Undergoing Caesarean Section

[1]Salwa Fawzy Mohamed Elsayed, [2]Amal Ahmed Hassan Omran, [3]Somaia Oda Abd-Elmenem and [4]Ola Abd-Elwahab Afifi Araby

(1) Nursing specialist at Directorate of Health Affairs in Suez Government, Egypt, (2&3) Professor of Obstetrics & Gynecological Nursing, Faculty of Nursing, Benha University and (4) Assistant Professor of Obstetrics & Gynecological Nursing, Faculty of Nursing Benha University.

Abstract

Background: Cesarean delivery is the most common major surgical procedure performed worldwide. It involves the same hazards as any other operation. **Aim of this study** was to evaluate effect of a clinical pathway intervention on knowledge and satisfaction of women undergoing caesarean section. **Research design:** A Quasi-experimental study design. **Setting:** The study was conducted in labor unit at Benha University Hospital in obstetrics and gynecological department. **Subjects**: A purposive sample of 120 women undergoing caesarean section divided in to two groups (study =60 women and control=60 women). **Tools of data collection: Tool (1):** A structured interviewing questionnaire schedule, **Tool (2):** Women's knowledge questionnaire, **Tool (3):** Post-partum CS complication and **Tool (4):** Women's satisfaction likert scale regarding clinical pathway. **Results:** There was statistical significant difference ($p<0.01$) between total score of effect of clinical pathway interventions on intervention group versus the usual care on control group. **Conclusion:** Clinical pathway intervention had positive effect on knowledge and satisfaction of study group. **Recommendation:** Developing periodical awareness program for women regarding the benefits of clinical pathway intervention on knowledge and satisfaction on women undergoing cesarean section.

Keywords: Cesarean section, Clinical pathway, Knowledge & Women's satisfaction.

Introduction

Cesarean section (CS) is considered one of the important operations of modern midwifery. In the 20th century there have been many new developments in the field of medicine granting increased safety to all surgical operations, which is mainly due to the availability of antibiotics, safe anesthesia and blood transfusion facilities **(Antoine & Young, 2021).**

Cesarean section is defined as surgical removal of fetus through maternal abdominal and uterine walls. It can be life –saving when vaginal delivery has potentially risks for both women and newborn **(Franchi et al., 2022).**

The increasing global rates of cesarean section have been one of the most debated topics in maternity care. Cesarean section is a major surgical procedure and like every surgical procedure, carries a significant risk of morbidity and mortality. Guidelines must be established and implemented for cesarean section and should be performed in the presence of specific and clearly defined indications only **(Diema et al., 2021).**

Cesarean section is classified as elective cesarean section when performed following advanced planning. Usually the decision to perform the surgery is made more than 24

hour before delivery. Emergency cesarean section is not planned or scheduled, if decision is made during the 24 hours before the delivery due to deteriorating fetal or maternal condition before onset of labor **(Fitzpatrick et al., 2022)**

Cesarean section is performed for maternal indications, fetal indications or both. Maternal indications include clinical conditions such as hypertensive disorder, amniotic fluids disorders, post term pregnancy, maternal distress, Rh-negative woman, psychological disorder and general disease complicating pregnancies such as thalassemia, anemia, asthma, and retention of urine. Fetal indications included multiple gestation, Macrosomia fetus and fetal distress. Indications related to both woman and fetus such as prolonged or obstructed labor, cephalopelvic disproportion, failed indication, placenta previa, and Malpresentation **(Mittal et al., 2020).**

Clinical pathways (CPWs), also known as care pathway or critical pathway is prominent organizational strategy to cut down expenditure and improve patient management **(Rotter et al., 2022).** It is described as complicated involvements that include the best available evidence and guidelines for a particular situation, including many elements. Mean-while, it is a multidisciplinary care plan that outlines the sequence and timing of actions required to achieve the desired patient outcomes and organizational goals relate to quality, cost, patient satisfaction, and efficiency. It aims to minimize latency and maximize resource utilization and care quality **(Hughes, 2021).** Compared with conventional medical care, CPW might be an appreciated approach to reduce the burden of both healthcare resources and insurance expenditure **(Gohar et al., 2023).**

Nursing staff serves as essential coordinators in the enhancement of hospital efficiency and resource optimization. The role of maternity nurse in the creation and implementation of clinical pathway interventions is crucial **(Bittencourt et al., 2022).**

Significance of the study:

Today, cesarean delivery is the most common major surgical procedure performed worldwide with an estimated 23 million procedures performed each year **(Lawrence and Brian, 2020).** According to World Health Organization (WHO), CS use continues to rise globally, now accounting for more than 1 in 5 (21%) of all childbirths. This number is set to continue increasing over the coming decade, with nearly a third (29%) of all births likely to take place by CS by 2030 **(World Health Organization, 2021).** In Egypt, Ministry of Health slammed the skyrocketing rates of CS deliveries, which make up (75-80%) of deliveries from (52%) in (2014), in comparison to an average of (25-30%) worldwide **(Matsui et al., 2022).**

Caesarean section involves the same hazards as any other operation. The possible side effects include excessive bleeding, infections, delayed recovery times after deliveries, delay in initiating breastfeeding as well as skin-to-skin contact, and a higher risk of complications in subsequent pregnancies. As a result, it appears critical that any action that improves outcomes be applied. So, more research is necessary to determine which clinical pathway interventions are most effective in the case of cesarean birth **(Wilson et al., 2021).**

The clinical pathway interventions are an interdisciplinary, evidence-based strategy to enhance clinical services throughout the

perioperative. The goal of clinical pathway intervention is to reduce the physiologic response throughout the operation to improve patient recovery outcomes while decreasing postoperative problems **(Caughey et al., 2018).** There is no study in Faculty of Nursing Benha University related to clinical pathway. Therefore, this study was conducted to evaluate effect of clinical pathway interventions on knowledge and satisfaction of women undergoing caesarean section.

Aim of the study

The aim of the present study was to evaluate effect of clinical pathway intervention on knowledge and satisfaction of women undergoing cesarean section.

Research hypothesis

The women who received clinical pathway intervention during cesarean section have significantly better knowledge and satisfaction more than those didn't received.

Subjects and Method

Study design: A quasi-experimental study design would be used.

Research Setting: This study was conducted at Obstetrics and Gynecological department at (antenatal ward and postnatal ward) at Benha University Hospital Qalyubia governorate, which provides free medical services for rural and urban citizens.

Sample type: A purposive sample of 120 women was included in the study divided in to two groups (study=60 women, control= 60 women).

Sample size and technique: The number of women who were admitted for caesarean section at obstetrics and gynecological department during a period of nine months from the beginning of data collection according to the following **inclusion criteria:**

- Women undergoing CS without any complications.
- Free from any medical and obstetrical diseases (according to obstetrician evaluation).
- Free from psychological diseases.
- Willing and active participation in the study.
- Available to communicate through phone or WhatsApp.

The sample was divided equally into two groups (study=60 women and control =60 women) which use the even number as study group and odd number as control group.

The researchers visited the previous mentioned setting, and explained the purpose of the study to the women with the previous mentioned criteria.

Tools of data collection:

The required data for the present study were collected through the following four tools:

Tool (I): A structured interviewing questionnaire:

It was designed by the researchers after reviewing national and international resources related literature **Ismail et al., (2021); Ibrahim & Abd El-Aty, (2022); Darwish et al., (2022)**. It was written in a simple Arabic language in the form of close and open ended questions (multiple choices questions) and consisted of two parts:

- **Part (1): General characteristics** of pregnant women consisted of 5 items such

as: (age, educational level, occupation, residence and supportive person).

- **Part (2): Obstetric history** consisted of 4 items: (gravidity, parity, current gestational age in weeks, and mode of last delivery).

Tool II: Women's knowledge about caesarean section questionnaire:

It was designed by researchers after reviewing a related literature **Magon et al., (2017); Hodges-Wills et al., (2021); Almedhesh et al., (2022)** and written in Arabic language. It was designed to assess women's knowledge before and after intervention regarding caesarean section and included 19 items (Definition, types, maternal and fetal indications and complications for cesarean section ,important preoperative preparation for CS, duration of preoperative fasting for woman undergoing CS, incision care after removing stitches, duration of post CS pain, side effect of excessive intake of pharmacological pain relief, types and advantages of non-pharmacological pain relief, preferable time to start drinking and eating after CS, to enhance the bowel habit the women should, healthy and adequate diet for post Cs women, preferable time to ambulate after CS, preferable time for postpartum exercises, the warning signs to call the surgeon, importance of prescribed medications compliance).

Scoring system:

All knowledge items were weighted according to items included in each question. Each item was given a score (2) when the answer was correct answer, a score (1) when the answer was incorrect answer or don't know. The total score was calculated by summation of the scores of all items. **The total knowledge score was classified as the following:**

- Adequate when the total score was ≥ 60%.
- In adequate when the total score was < 60 %.

Tool III: Postoperative caesarean section complication questionnaire:

Post cesarean complications among women in enhanced recovery pathway and routine care groups was recorded after two weeks such as: (Breast abscess, wound infection, puerperal sepsis and constipation).

Tool IV: Woman's Satisfaction likert scale regarding clinical pathway:

It is adapted from **Ari, (2012) .** The rating scale was designed to assess the level of satisfaction of the women regarding the clinical pathway nursing intervention. This was assessed by the researcher after implementation of clinical pathway. It consisted of (15) items. The women were instructed kindly read or listen to the items, described her satisfaction regarding intervention and give the responses freely and frankly. The responses were kept confidential. Responses for each item extended from agree (3), neutral (2) and to disagree (1). **The total satisfaction score was classified as following:**

- Highly satisfied when total score (31-45)
- Satisfied when total score (16-30)
- Un satisfied when total score (1-15)

Content validity and reliability:

The tools were developed after reviewing the current and past national and international relevant literature related to clinical pathway interventions on cesarean section women, by using local and international books, journals, periodicals and computer searches then tools were reviewed by 3 jury experts in the field of obstetrics and

Gynecological nursing at Benha University to test for clarity, relevance, comprehensiveness, and applicability.

Reliability was done by Cronbach's alpha coefficient test which revealed that each of the tools consisted of relatively homogenous items as indicated by the moderate to high reliability of tools

Tools	Cronbach's alpha coefficient test
Tool I: part "3" Woman's knowledge	α = 0,83
Tool II: Visual analog scale	α =0,902
Tool IV: Woman's Satisfaction	α = 0,79

Administrative design

A written official approval to conduct this study was obtained from the Dean of Faculty Nursing to director of Benha University Hospital. Other written official letters would be taken and delivered to the director of obstetrics and gynecology department, in order to obtain agreement to conduct the study after explaining its purpose.

Ethical considerations

Ethical aspects were considered before starting the study as the following:

- The study approval was obtained from Scientific Research Ethical Committee of the Faculty of Nursing at Benha University for fulfillment of the study (REC-OBSN-P 83).
- An official permission from the selected study settings was obtained for the fulfillment of the study.
- Before applying the tools, the researchers explained the aim and importance of the study to gain women's confidence and trust.
- The researchers took oral consent from women to participate in the study and confidentialities were assured.
- All tools of data collection were burned after statistically analysis to promote confidentiality of the participating women.
- The researchers ensured that the study didn't cause any harm for any women during data collection. Also, the study didn't include any immoral statements and respect human rights.
- The women were free to withdraw from study at any time.

Pilot study

The pilot study was conducted on 10% of data collection period (4 weeks in which12 women) before starting data collection to test the clarity, applicability of study tools, and the feasibility of the fieldwork and determine the time needed to fill in the questionnaire. There were no modifications done, and the women involved in the pilot study were included in the study sample.

Field work

The study was conducted from the beginning of May 2023 and completed at the end of January 2024, covering 9 months. The researchers visited the previous mentioned setting two times/week from 9.00 A.M. to 2.00 P.M. at Obstetrics and Gynecological department at Benha University Hospital until the predetermine duration completed. At the end of this study the booklet about caesarean section care was left in the ward to be provided to all women, so the benefit was spreaded.

To fulfill the aim of this research, the following phases were adopted; preparatory phase, assessment and interviewing phase, planning phase, implementation phase and evaluation phase.

Preparatory phase:

The preparatory phase was the first phase of the study; the researchers carried out through review of local and international

related literature about the research problem. This helped the researchers to be acquainting with magnitude and seriousness of the problem, and guided the researcher to prepare the required data collection tools.

Assessment phase:

The researchers screened all women who were undergoing caesarean section on the day before the operation. Women files would be examined to ensure that their eligibility for the study.

Then, the women were individually interviewed by the researchers to take their consent after clarifying the study aim. At the beginning of interview, the researchers greeted each woman, introduced herself and explained the aim of the study.

The researchers collected (Tool I: a structured interviewing questionnaire "general characteristics and obstetric history" and women's knowledge questionnaire) from both groups immediately after obtaining consent.

Planning phase:

Based on results that obtained during assessment and interviewing phase, booklet about caesarean section care was developed by the researchers. The booklet was designed specifically for caesarean section women in simple Arabic language to suit the level of understanding and to satisfy the studied women's deficit knowledge regarding caesarean section care.

General objective: By the end of the educational session, each woman would be able to acquire essential knowledge and have and satisfaction.

Implementation phase:

For control group: The women in control group received routine hospital care only without intervention.

For study group: The women in study group received clinical pathway intervention in addition to routine hospital care.

The day before C.S, the women received educational session about C.S. The researchers applied all steps of clinical pathway intervention for the study group as following.

Supportive material regarding clinical pathway for cesarean delivery (educational booklet) included four parts: pre-operative, intraoperative and post-operative CS care, in addition to home instructions (Discharge instructions) (**Lucas and Gough, 2013).**

Components of clinical pathway Protocol for Cesarean Delivery

Pre-operative preparation which included:

Pre- operative maternal education which included:

The day before CS:

On the day before operation and immediately after assessment and interviewing phase, an educational session was conducted to equip the women with knowledge about CS and its pre, intra, post-operative care and discharge instructions. The duration for this session was from 45 to 60 minutes.

The day before the CS, the woman consumed a regular diet. Additionally, women may eat solid foods until 8 hours before scheduled CS. Women cleaned abdomen area after taking a shower or bath. For at least 48 hours, she shaved he region below the umbilicus. Prescribed medicines were taken according to the obstetrician's or nurses' instructions. On this day, clinical pathway goals were also reviewed with women who would have CS, which included (improved post-operative outcomes, early return of gastrointestinal function, excellent pain management with a reduction in the need for opioids, a reduction in the length of stay in the hospital and prevent post-operative complications). The researchers created a handout that would be send to all nurses and women in the trial group to help them learn

more about CS and how to provide it. It addressed the definition, kind, indications, and complications, as well as self-care, food, workouts, wound care, breastfeeding, and how to treat minor postoperative discomforts.

The morning of CS:

The women avoided makeup, removed all jewelry, did not use nail polish on finger nails. The nurse asked the women to change the clothes into a hospital gown.

Intra operative clinical pathway intervention:

An intravenous (IV) catheter was placed, a tube was inserted, the woman saw members of the anesthesia team and reviewed the anesthetic strategy, the woman also saw and spoken with the obstetrician, and the nurse administered various medicines ordered by the medical team. These medicines assisted to reduce the risk of infection following CS by reducing pain, nausea, and vomiting.

Operating Room

The woman was given a localized anesthetic, either an epidural or a spinal, which allow her to remain awake during the CS while experiencing no discomfort in her lower body. It was typically safer for the mother and the baby. A catheter was placed after a regional anesthesia. Apgar score, cord clamp, maintaining newborn body temperature (36.5°C – 37.5°C) after birth, skin to skin contact, weight, newborn metabolic screening, physiological health, head to toe assessment to rule out any complications or abnormalities, and behavioral assessment would be all part of the newborn's care. The woman and her infant were sent to the recovery room after the delivery and remained there till the night.

Post-operative clinical pathway intervention:

The nurse role was included checking the mother VS, abdomen, uterine contractility, lochia and catheter. Providing the comfort and warm to the mother, encouraging the woman to chew gum. Catheter should be removed as soon as the woman regains the ability to move. The important postoperative was to keep the mother pain at or below a score of 4 out of 10. The meals should be eaten while sitting in a chair, not in bed. Mother should move up and out of bed with assistance and walking in the hallway 4 – 5 times daily.

The day of caesarean section:

Pain control: After SC, long-acting pain medications would be prescribed such as: (Acetaminophen and ibuprofen to keep the pain under control).

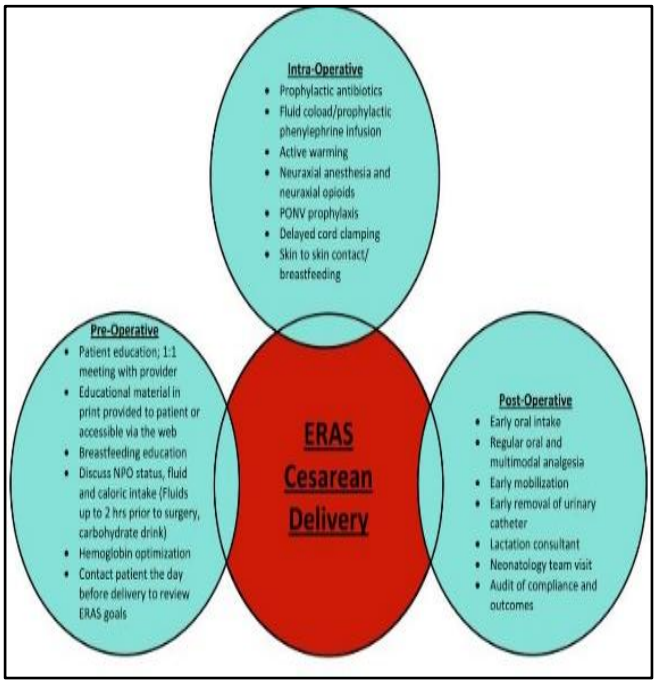
Activities: Leg exercises 4-5 times every hour while the mother awake. The nurse encouraged the mother to walk in the hall the day of her surgery.

Eating and drinking: liquids within 4 hours of surgery, chew sugarless gum for 30 minutes 3 times a day if the women would not be able to drink or eat, this helped the bowels return to normal more quickly after surgery. The nurse applied pharmacological and non-pharmacological methods to prevent post CS nausea and vomiting.

Tubes and Lines: Most women who received clinical pathway intervention could remove their IV when they were able to get up out of bed and abled to drink fluids.

Goals for Discharge:

Women in clinical pathway intervention were discharged within 12 hours in uncomplicated cases. The following indicators would be used to determine if the mother was ready to go home: Ability to eat a diet without feeling nauseous or experiencing any vomiting and getting out of bed and walking without help.



Post-Operative Day 1:

Pain Control: These were continuing as scheduled medications after discharge for up to a total of 7 days. Beside that non pharmacological methods of pain relieve should be apply.

Activities: The mother should be out of bed for a total of 8 hours during the day, on and off. Walk down the hall 4-5 times each day, with help if needed. During all meals, sit in a chair. While seated on the chair, feed the baby

Eating and Drinking: Drink lots of water. The woman must consume solid meals. Fruit, vegetables, milk, and calories are the best choices for supporting breastfeeding and preventing constipation (fruits, vegetables). Chew gum for 30 minutes three times a day if woman does not eat or drink regularly.

Post-Operative Day 2

Pain Control: The woman continued receiving scheduled medications to prevent pain including acetaminophen (Tylenol) and ibuprofen (Motrin) as doctor order.

Activities: The woman should get out of bed and eat her meals on a chair. Today, walk through the hallway 5 times, using assistance if necessary. While seat on the chair, feed the baby. Sitting in the chair or walking in the hall while visiting the guests.

Eating and Drinking: Drink warm drinks and consume solids as tolerated by the woman. If women don't eat or drink regularly, chew gum for 30 minutes three times a day.

Discharge instructions (home instructions):

Incision care: Showering was recommended for the woman. Allowed the water to gently flow over the incision while gently washing the area. If the mother had stitches or staples, these would be removed during the first doctor appointment. Do not scrape the surface and do not apply pressure to it.

Pain: After the CS, the woman would be told that minor pain may last for a few weeks. Medications for pain relief may be continued if the doctor so orders. The nurse kept track of how much pain the women would be in and what medication the women taken at home. Pain relief that is not pharmaceutical should be used.

Bowel Habits: A woman should drink 8-10 glasses of water daily, exercise and stool softeners may be used if the doctor tells the woman to do so. Bowel patterns may change after a CS.

The woman was instructed about warning signs to call the surgeon:

Stop passing gas for more than 12 hours, significant diarrhea &worsening nausea or vomiting

Activities: The women were instructed about postpartum exercises over six weeks. These included walking, pelvic floor exercise, practice good posture and light stretches. The women will be told to avoid lifting heavy anything for 2-3 weeks after surgery.

Diet: No special diet is necessary unless ordered by the healthcare team. Resume a healthy, balanced diet.

Evaluation phase:

Women's knowledge was evaluated using the same format of pre-test and just before discharge. The researchers evaluated the outcomes of clinical pathway intervention on the study group and compared them with the control group who received the routine hospital care as following:

- Post CS complications 2nd week post-operative).
- Satisfaction (at the end of clinical pathway intervention, after 2 weeks).

Limitation of the study: The main obstacles were lack of information about clinical pathway interventions during caesarean section which required more effort.

Results:

Table (1) clarifies that less than two-thirds (65.0%) of the study group and more than half (53.3%) of the control group in age group from (20- <25 years old) with a mean age of 25.16±4.27 and 26.34±5.29 years old respectively. Moreover, more than half and (56.7% and 51.7%) of both study and control groups respectively lived in rural area. Concerning level of education, it was cleared that less than half and half (46.7% and 50.0%) of both study and control groups respectively had secondary education.

As regards occupational status, more than three-quarters and less than three-quarters (76.7% and 70.0%) of both study and control groups respectively were housewives. Finally, more than half (58.3%) and more than two-thirds (68.3%) of both study and control groups respectively reported their parents as a supportive person. Generally, there was no statistically significant difference between study and control groups regarding personal characteristics (p>0.05). That is the two groups under study homogenous.

Figure (1) displays that, (30.0%) of study group and (31.7%) of control group had adequate knowledge regarding cesarean section before implementation of the clinical pathway intervention. Meanwhile, after implementation of clinical pathway intervention, (76.7%) of study group had adequate knowledge compared with (33.3%) of the control group.

Table (2) demonstrates that after implementation of the clinical pathway intervention, there was a statistically significant difference in relation to complications on 2nd week namely (breast abscess, wound infection, puerperal sepsis and constipation) between two groups (p< 0.05) in the favor of women in the study group.

Figure (2) illustrates that, less than two-thirds (61.7%) of women in study group were satisfied with implementation of clinical pathway intervention compared to one- third of women in control group. Moreover, less than one- third and the minority (30.0% and 10.0%) of women in study and control groups respectively was highly satisfied.

Table (1): Distribution of studied sample according to their general characteristics (n= 120)

General characteristics	Control group (n=60)		Study group (n=60)		Chi square test	P- value
	No	%	No	%		
Age (in years)					1.94	0.584
<20	13	21.7	9	15.0		
20- <25	32	53.3	39	65.0		
25- <30	10	16.7	7	11.7		
>30	5	8.3	5	8.3		
Mean ±SD	26.34±5.29		25.16±4.27			
Residence					0.302	0.583
Rural	31	51.7	34	56.7		
Urban	29	48.3	26	43.3		
Level of education					1.08	0.781
Not read and write	6	10.0	6	10.0		
Primary education	7	11.7	11	18.3		
Secondary education	30	50.0	28	46.7		
High education	17	28.3	15	25.0		
Occupation					0.681	0.409
Housewife	42	70.0	46	76.7		
Work	18	30.0	14	23.3		
Supportive person					2.04	0.359
Husband	13	21.7	20	33.3		
Parents	41	68.3	35	58.3		
Neighbors	6	10.0	5	8.3		

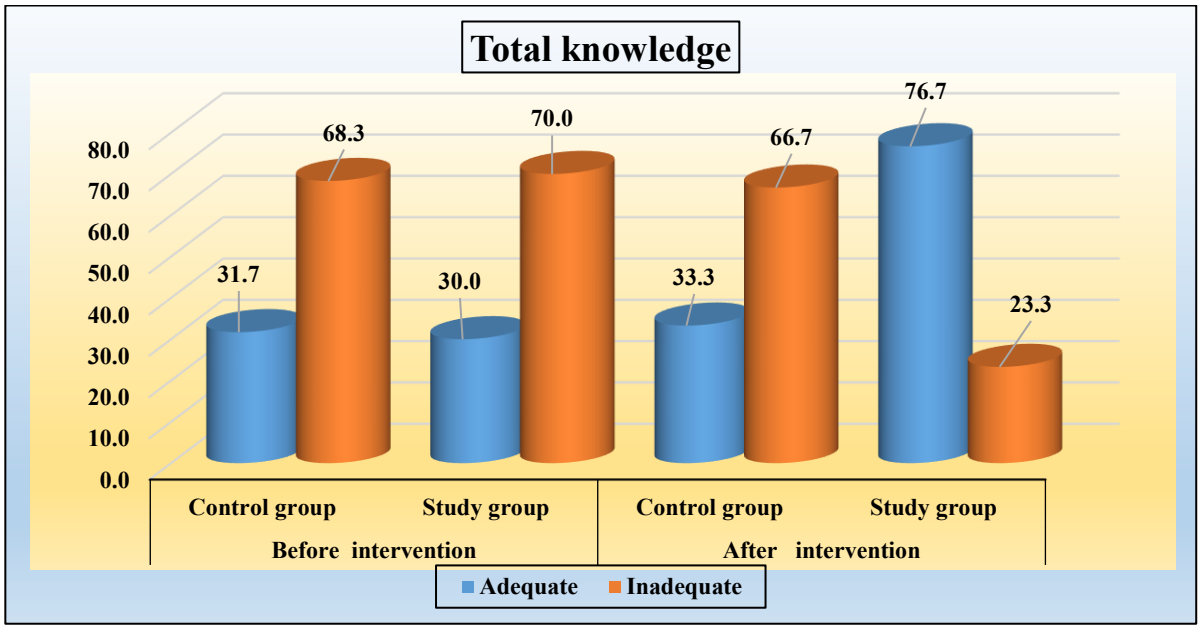


Figure (1): Distribution of the studied sample according to level of total knowledge score regarding cesarean section in both study and control groups before and after clinical pathway intervention (n =120).

Table (2): Distribution of the studied sample according to their Post-cesarean section complications on 2nd week in both study and control groups (n=120).

Complications on 2nd week	Control group (n=60)		Study group (n=60)		X^2/FET	P value
	No	%	No	%		
Breast abscess	5	8.3	1	1.7	**4.82**	**0.028***
Wound infection	4	6.7	0	0.0	**4.13**	**0.042***
Puerperal sepsis	2	3.3	0	0.0	**2.03**	**0.154**
Constipation	16	26.7	5	8.3	**6.98**	**0.008***

*** A Statistical significant p ≤ 0.05**

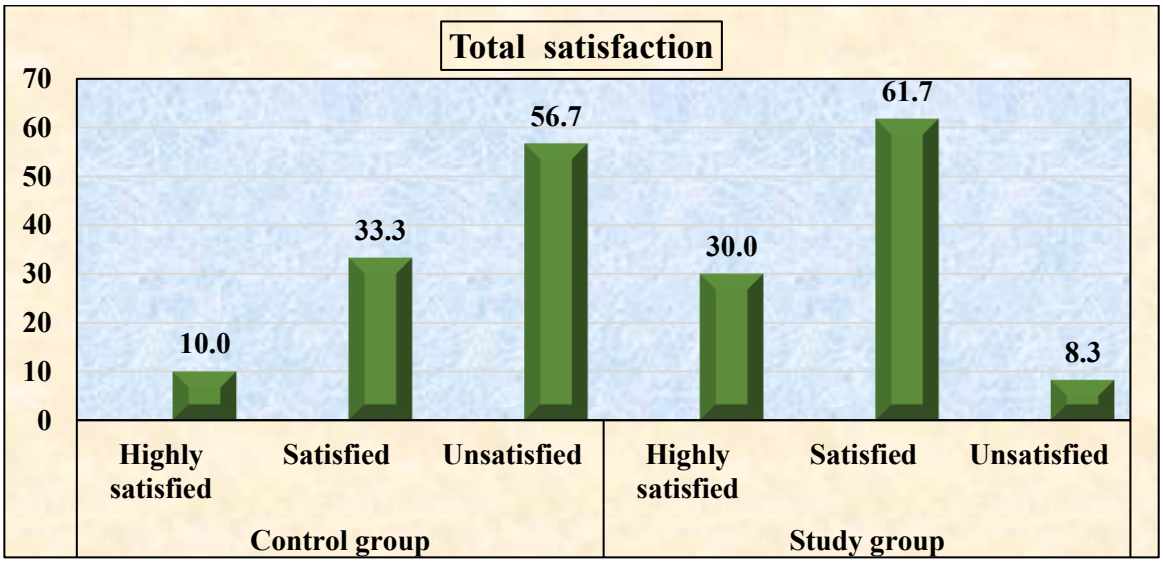


Figure (2): Distribution of the studied sample according to level of total satisfaction score toward provided post-CS care in both study and control groups (n=120)

Discussion

Clinical pathway management is standardized, highly coordinated interdisciplinary preoperative surgical care program that in corporate evidence based interventions to minimize surgical stress, improve physiological and functional recovery, reduce complications, and facilitate earlier discharge from the hospital and reduce cost of care **(Mundhra et al., 2024).**

Studies have documented an association between the use of clinical guidelines and pathways and positive outcomes including the provision of high quality. Cost effective care, greater woman and staff satisfaction, and better resource management in a variety of clinical contexts (**Grash et al., 2023**).

The aim of the current research was to evaluate the effect of clinical pathway interventions on recovery and satisfaction of women undergoing cesarean section. This aim was significantly achieved with the frame work through the present research hypotheses, since the present study research findings had revealed statistically significant improvement among the studied group's .So, the study hypotheses were accepted and supported and the aim of the study was achieved.

Regarding general characteristics, the finding of the present study revealed that less than two-thirds of the study group and more

than half of the control group in age group from (20- <25 years old) with a mean age of 25.16±4.27 and 26.34±5.29 years old respectively. Moreover, more than half and of both study and control groups respectively lived in rural area. Concerning level of education, it was cleared that less than half and half of both study and control groups respectively had secondary education. As regards occupational status, more than three-quarters and less than three-quarters of both study and control groups respectively were housewives. Finally, more than half and more than two-thirds of both study and control groups respectively reported their parents as a supportive person. Generally, there was no statistically significant difference between study and control groups regarding personal characteristics. That is the two groups under study homogenous.

This results similar to a study conducted by **Emam et al., (2021)** about "Implementing Enhanced Recovery Pathway after Surgery Protocol for Women Undergoing Cesarean Section Delivery", revealed that Concerning educational level, more than one third of both study and control group had a secondary education respectively. Besides, more than one half of both study and control group respectively were lived in rural area. As regards occupation, nearly three quarter of both study and control groups respectively were housewife. Regarding demographic characteristics, there was no statistically significant difference between the study and control groups. That is the two groups under study homogenous. Also, these results were in the same line with **Ismail et al., (2021)** who conducted the study about "Impact of Enhanced recovery pathway application outcomes on nurses and women undergoing cesarean section" found that there were no statistically significant difference among the studied women in both groups according to demographic characteristics($p<0.05$) . Additionally, the result of the current study matched with **Gohar et al., (2023)** who studied "Effect of Implementing Enhanced Recovery After Surgery Pathway for Women Undergoing Cesarean section on Maternal Outcomes and satisfaction" revealed that there was no statistically difference between clinical pathway group and control group regarding the general characteristics.

Increasingly, these results were in accordance with **Elagamy et al., (2020)** who studied "the effect of intrapartum clinical pathway application on maternity nurse's performance and women satisfaction" stated that there was no statistically significant difference between the clinical pathway group and routine care group concerning demographic characteristics except for residence (P =.023).

On the other hand, these results disagreed with **Ibrahim & AbdEl-Aty, (2022)** who studied "Effect of Postpartum Standardized Care Guidelines to Cesarean Section Women on Pain Relief and Satisfaction: Comparative Study" showed that there was significant difference between the two groups in general characteristics as women in the study group had a mean age ± SD of 25.6 ± 5.6, compared to 27.2 ± 3.9 in the control group. Meanwhile, less than half of the women in the study group had a university or higher education, and less than a third of the women in the control group had a secondary education.

According to women's knowledge regarding cesarean section, the finding of present study showed that there was no statistically significant difference between studied women between both study and control groups regarding their knowledge about cesarean section before implementation

of the clinical pathway intervention (P>0.05). On the other side, there was a highly statistically significant difference between both groups regarding their knowledge after implementation of the clinical pathway intervention, as the study group women had a higher percentage of knowledge score than these in control group. Also, it was displayed that, less than one-third of study group and less than one-third of control group had adequate knowledge regarding cesarean section before implementation of the clinical pathway intervention. Meanwhile, after implementation of clinical pathway intervention, more than three-quarters of study group had adequate knowledge compared with one-third of the control group.

The researcher believed that mother's knowledge, is very important to become oriented with it to educating women undergoing CS and have improved knowledge that help them in their home care and help the women to have the knowledge about CPWS which help in early recovery and satisfaction with provided care.

These results agreed with the study done by **Ismail et al., (2021)** about "the impact of enhanced recovery pathway application outcomes on nurses and women undergoing CS" who showed that the higher percentages of women in the study group were having good knowledge regarding incision care, pain control measures, measures to prevent elimination discomforts activities/exercise, diet and prescribed medications compared to in the control group. This difference was statistically significant (p=.000).

In addition, this result was accordance with **Elagamy et al., (2020)** which displayed that, the higher percentages of women in the clinical pathway group had satisfactory knowledge regarding diet during labor, pain relief measures, and activity (walking) with the percentage of 66.7 %, 70% & 88.3% compared to 23.3%, 28.3% & 25% respectively of women in routine care group, which indicated statistically significant difference was found (p=.000). Increasingly, this result matched with **El-Baz, (2018)** who conducted a study entitled "Are the outcomes of clinical pathways evidence-based? A critical appraisal of clinical pathway evaluation research" reported that knowledge scores of the study group subjects who participated in the nursing clinical pathway were higher than that of the control group. This may be due to that education of patients and their relatives during the clinical pathway implementation appeared to have a positive influence on the patients' recovery with earlier discharge from hospital.

Additionally, the finding of the present research was in the same line with the study done by **Abd-El-Rhman, (2001)** who studied **"**Designing a clinical pathway for the care management of patients with burns at management of patients with burns " found that there was an obvious improvement in quality of care and improvement in patient knowledge level post clinical pathway implementation .

Increasingly the result of the current study matched with **Emam et al., (2021)** who found that there were highly statistically significant differences(P<0.001**) in women's knowledge between the two groups before intervention about home care post cesarean section as women in the study group were having good knowledge regarding wound care, measures of pain control, measures to prevent elimination discomforts, activities/exercise, nutrition, and medications as prescribed more than the control group.

Regarding to post-operative complications, the current study demonstrated that after implementation of the clinical pathway intervention, there was a statistically

significant difference in relation to complications on 1st day namely (nausea, vomiting, vaginal bleeding, abdominal distension and constipation) between two groups in the favor of women in the study group.

Moreover, there was a statistically significant difference in relation to complications on 3rd day namely (wound bleeding, breast engorgement, vaginal bleeding and constipation) between two groups ($p< 0.05$) in the favor of women in the study group.

Furthermore, there was a statistically significant difference in relation to complications on 2nd week namely (breast abscess, wound infection and constipation) between two groups in the favor of women in the study group.

These results in the same line with **Emam et al., (2021)**, who indicated that women in the study group were less likely to experience postoperative complications compared to the control group, more than three quarters of study group were less likely suffers from vomiting compared to more than half of control group. Moreover, almost of women in study group not required to antiemetic compared to more than three quarters of control group with a highly significant difference between the two groups.

Also, this study in the same context with **Ibrahim et al., (2022)** which showed that the control group had a higher rate of postpartum complications on the first day. Meanwhile, nausea and vomiting, abdominal distension & constipation, wound bleeding, and D.V.T. All had statistically significant differences (P=0.001). In the same table, the control group had a higher rate of postpartum complications on the second day than the study group. Abdominal distension and constipation, hemorrhoid, breast engorgement, pulmonary complication and D.V.T, and wound bleeding with statistically significant differences (P=0.001).

As well as, these results matched with **Darwish et al., (2022)** who studied "Enhanced recovery after cesarean section (CS) versus conventional care in lower middle-income country" found that the study's complications rate in study group was lower those in control group. This conclusion is consistent with the current finding that women in the study group were less likely than those in the control group to experience problems such as stomach cramps, distension, and constipation.

Increasingly, in the same line with **Shahine et al., (2021)** who showed that clinical pathway was effective in improving post-operative outcomes as well as decreasing the incidence of complications in the post-operative period.

However, on the other hand with **Gohar et al., (2023)** revealed that there were no significant differences between the two groups regarding postoperative complications. This finding is consistent with **Mundhra et al. (2024),** who found that there was no significant difference between the two groups related to postoperative complications, blood loss, and readmission rates. The researchers have attributed the results of the study to the fact that there are no significant differences among the two groups related to causes of CS, reproductive history, or current pregnancy history. Also, women with medical conditions were excluded from the study.

According to women's satisfaction with clinical pathway interventions, the present study mentioned that, less than two-thirds of women in study group were satisfied with implementation of clinical pathway intervention compared to one-third of women in control group, with there significant

difference between control and study groups. Moreover, less than one-third and the minority of women in study and control groups respectively was highly satisfied.

These results in the same line with **Gohar et al., (2023)** revealed that the majority of the women in the experimental group were highly satisfied with implementing the ERAS protocol. Also, the current findings are relatively in harmony with research accomplished by **Darwish et al., (2022)**, who concluded that women's satisfaction scores in the ERAS group were significantly higher than those in the control group after application of the clinical pathway after surgery.

Additionally, these findings matched with **Thangavel & Gerges, (2021)** in their study about "patient satisfaction with the ERAS protocol after gynecological oncology" reported that high levels of women's satisfaction were observed in the ERAS group more than the control group. Also, they recommended that the implementation of an ERAS protocol with gynecological oncological surgery be generalized. Likewise, **Karki & Saha, (2021)** who studied "patient satisfaction after implementing the ERAS protocol for elective cesarean sections" their results clarified that almost all of the women undergoing cesarean sections were satisfied with the ERAS protocols than those in the control group, and the majority of them would prefer to undergo surgery under the ERAS protocol in the future.

Increasingly, our results in the same line with **Ibrahim & AbdEl-Aty, (2022)** revealed that women in study group were satisfied more with all seven aspects of standardized care guidelines with a mean of 64.35 ± 13.67 compared to 63.34 ± 12.67 in control group who receive routine care and there were statistically significant improvement (P=0.0002).Moreover, the study results supported by **Elagamy et al., (2023)** studied "Effect of intrapartum clinical pathway application on maternity nurses performance and women satisfaction" clarified that there was a statistically significant difference (p=.000) between the routine care group and the clinical pathway group regarding satisfaction with intrapartum care this may be explaind by the level of satisfaction depending on the practicing of care which showed the effectiveness of clinical pathway upon the level of satisfaction of intrapartum women.

The researchers believed that, it is a natural result because a woman's satisfaction can be affected by several factors, including postoperative pain and complications, LOS, the occurrence of nausea and vomiting, and breast feeding initiation. The implementation of an ERAS protocol is both a desirable and comprehensive solution to these problems. Moreover, it enhances therapeutic staff-patient communications, thereby alleviating anxiety and stress and promoting satisfaction.

These results supported with the study conducted by **Erdogan et al., (2023**) about "Effects of clinical pathway interventions on satisfaction and indicates that there was a highly statistically significant difference between both study and control groups regarding mean score of all satisfaction items after provision of post-CS care in the light of routine care or clinical pathway intervention (P< 0.001), as the study group women had a higher mean score than these in control group

Moreover, Women's satisfaction with clinical interventions is important factor to consider while evaluating them. Women's satisfaction might be lowered due to a variety of causes. Aside from pain, adverse reactions, and wound healing, mother concerns include family and medical support, breastfeeding success, and skin-to-skin contact with the newborn. The application of postpartum

clinical guidelines is a desirable and comprehensive answer to these issues **(Moore & Medley, 2016).**

Conclusion

There was a statistically improvement in knowledge and satisfaction for women undergoing CS in the study group compared to control group by using clinical pathway interventions, so the aim of the study was achieved, and the research hypotheses were accepted and supported.

Recommendations

Developing periodical awareness program for women regarding the benefits of clinical pathway intervention on knowledge and satisfaction of women undergoing cesarean section

Further studies

Reapplication of the present study on another setting and on another large sample size for generalization**.**

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تأثير تدخل المسار السريرى على معرفة ورضا السيدات اللاتى تخضعن للولادة القيصرية

سلوى فوزى محمد السيد- أمل أحمد حسن عمران- سمية عودة عبد المنعم- علا عبد الوهاب عفيفى عربى

تعتبر الولادة القيصرية من اكثر التدخلات الجراحية التى تتم على مستوى العالم والتى تشمل على نفس مخاطى أى تدخل جراحى. **الهدف من الدراسة:** هدفت هذه الدراسة إلى تقييم تأثير تدخل المسار السريرى على معرفة ورضا السيدات اللاتى تخضعن للولادة القيصرية. **تصميم الدراسة:** تم استخدام تصميم شبه تجريبى. **مكان الدراسة:** أجريت هذه الدراسة بقسم الولادة بمستشفى بنها الجامعى. **عينة الدراسة**: عينه غرضيةمكونة من ١٢٠ سيدة اللاتى تخضعن للولادة القيصرية وتم تقسيم العينة إلى مجموعتين بالتساوى (مجموعة الدراسة =٦٠ سيدة والمجموعة الضابطة = ٦٠ سيدة). **أدوات جمع البيانات:**تم استخدام أربع أدوات: الأداة الأولى: استبيان مقابلة منظم، الاداة الثانية:استبيان معلومات السيدات، الاداة الثالثة: مضاعفات ما بعد الولادة القيصرية والأداة الرابعة : استبيان عن رضا السيدات تجاة المسار السريرى (مقياس ليكارت). **النتائج:** كشفت النتائج أنه يوجد فرق ذو دلالة إحصائية بين تدخل المسار السريرى على مجموعة الدراسة مقابل الرعاية المعتادة على المجموعة الضابطة. **الاستنتاج:** وقد لخصت النتائج على أن تدخل المسار السريرى كان له تأثير إيجابى واضح على معرفة ورضا مجموعة الدراسة. **التوصيات:** وضع برنامج توعويى دورى للنساء حول فوائد تدخل المسار السريرى على معرفة ورضا السيدات اللاتى تخضعن للولادة القيصرية.