IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 8, Issue 1 Ser. IV. (Jan. - Feb .2019), PP 50-60
www.iosrjournals.org

EFFECTIVENESS OF POSTPARTUM ENHANCED RECOVERY PATHWAY INTERVENTION ON THE OCCURRENCE OF POSTOPERATIVE COMPLICATIONS FOR PRIMIPAROUS WOMEN UNDERGOING ELECTIVE CESAREAN SECTION

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ABSTRACT

clinical pathway nursing management is standardized, multidisciplinary approaches for caring patients with a goal of decreasing length of stay and care without negatively affecting patient outcomes ***objective:*** *to evaluate the effects of enhanced recovery pathway intervention on postoperative complications for primiparous women undergoing elective cesarean section.* ***Methods:*** *a prospective evaluation enrolled consecutive on elective cesarean section women at Mansoura university hospital. Intervention and control groups were assigned via random number generation. Maternal health indicators were recorded at first, third day, 2weeks and 3 months after delivery via chart review and written/telephone. results: overall, 250 women were assigned to the intervention group and to the control group, (125 study group(A) who received pre and postoperative care of clinical pathway and 125 control group(B) who received postoperative routine care of the hospital).* ***results:*** *statistically significant differences observed between the intervention participants and the control group as the intervention participants were more likely to in the early oral intake(p = 0.022), postoperative bowel mobility p = 0.022, improvement immediately in the practice of mothers as well as decreasing the incidence of health problems in the post-operative period , less likely to have shorter mean period for suture removal and length of stay than the control group were observed.* ***Conclusion:*** *implementation of clinical pathway led to reduce postoperative complications, decrease length of stay, improving mother's performance related to breast feeding, early ambulation and post natal exercise.* ***Recommendation:*** *clinical pathways should be applied in C S operations to improve patient outcome and reduce postoperative complications*

Date of Submission: 01-01-2019 Date of acceptance: 15-01-2019

I. Introduction

A major challenge in healthcare is to consolidate advancements into routine clinical practice. Moreover Enhanced Recovery Program (ERP) involves the application of an arrangement of strategy, measures and methodologies pointed at patients who are progressing to undergo a surgical procedure with the objective of upgraded recuperation, decreasing stress, diminish complications and mortality. ***(Rocha et al.2014).***

Clinical pathway includes standardized procedures developed to guide evidence-based health care toward avoid inconsistent practice, to advance quality of care and move forward clinical outcome as well as to maintain a strategic distance from superfluous delays and to decrease costs .It has been widely applied in various clinical organization disciplines ***(Numerato, , Salvatore, , & Fattore, 2012; Vogel, et al 2017).*** In actual fact, the combination of prove based components of care into a pathway for elective cesarean surgery comes about in a lessening organ dysfunction, encourages more fast recovery, abbreviated length of remain in

hospital and return to ordinary activity. The point of the pathway is can presently be portrayed as standard practice ***(Wolf, 2018).***

Caesarean section (CS) is one of the commonest surgical methods performed. there has been a dramatic increment within the caesarean rate around the world, which presently surpasses 30% .In Egypt, cesarean birth rate has been raised drastically from 27.6, in 2010 to 55% in 2016 ***(Martin, 2016 ;Al-Rifai, & Aziz, 2018).*** One of the key challenges to the usage of these pathways improved recuperation programs are outlined have common topics of comprehensive patient instruction counting patient objectives and desires around surgery, dodging preoperative fasting and bowel planning, early oral intake, restricting utilize of drains and catheters, multimodal analgesia, early ambulation, and prioritizing eu-volemia and normo-thermia. Person interventions in these regions are combined to form a master convention, which is actualized implemented as a bundle to move forward surgical outcomes ***(Tarin et al., 2014;Thiele et al, 2015).***

Enhanced recovery **(ER**) pathway that could be carried out by maternity nurse in obstetric surgery may result in meaningful improvement of post-operative outcome This incorporate early return of gastrointestinal function, great pain management with altogether diminish opioids necessities, diminish length of hospital remain. This study aims to determine the effect of clinical pathway postoperative nursing care for woman undergoing caesarean section at Mansura University Hospital ***(Kalogera et al., 2013; fawzy,et al,2016).***

AIM :.The aim of the study was therefore to

Evaluate the effects of a intervention for primiparous women underwent CS on the occurrence of postoperative complications.

It was considered that this intervention might fill the gap in continuity of care, and enhancement women support.

Hypothesis: women who received the standardized nursing care following CS experience less postoperative problems than those who only received routine nursing care of the hospital.

II. Patients and Methods

Research design: A quasi-experimental design (post-test) was utilized in this study. **Setting**: this study was carried out in the inpatient (obstetric and gynecological department) affiliated to Mansoura University Hospital.

Study Population and Sample: The target population consists of elective-CS-who had an odd number at cesarean operational delivery list was recruited in the present study**.** ***Sampling method***: A systematic sample technique was used to select the women under the study during the study period.

Sampling and Sample size: Sample size:-

The sample size was calculated according to the following equation

$$N = \frac{2Pq\ (ZQ \backslash 2 + ZB)\ 2}{(P1 + P2)\ 2}$$

Where:-

N = Sample size, P = (P1 + P2) /2 ,**Q** = 1- P ,**Z Q** = 1.96 ,**Z B** = 0.84

Accordingly, the estimated sample size was 112 women per group. After adjustment for dropout rate of 10%, the sample size was increased to 125 women per group. The sample size was 250 mothers estimated to detect difference between the rates of postoperative complication for woman undergoing CS in the control group (P1=25%) and the expected rate in the intervention group (P2= 10%) with a 95% level of confidence (& error = 5 %) and a study power of 80% (B error = 20 %) using the equation for the differences between two proportions ***(Schlesselman , 1982).***

The study subjects were divided into two equal groups of 125 parturient women each, as follows: ***Group A*****;** the clinical pathway management was used for women to hasten recovery and attenuate the stress response associated with surgery. Key elements common to all enhanced recovery pathways (a term coined by Dr. Kehlet) include: preoperative patient education, reduction of preoperative fasting, omission of bowel preparation, perioperative normovolemia, limited use of nasogastric tubes and drains, early removal of urinary

catheters, aggressive multimodal analgesia to minimize opiate consumption, early postoperative mobilization, and early enteral nutrition. ***Group B;*** the control group who receive postoperative routine hospital care after cesarean section.

Inclusion criteria: Primigravida, the pregnant women whose age ranged from 20 to 35 years old, elective cesarean delivery, single fetus, free from any pregnancy related complications and Gestational age ≥37 wks.
Exclusion criteria: Congenital anomalies and pregnancy associated with medical problems *e.g.* cardiac disease and woman with chronic problems such as renal disease.

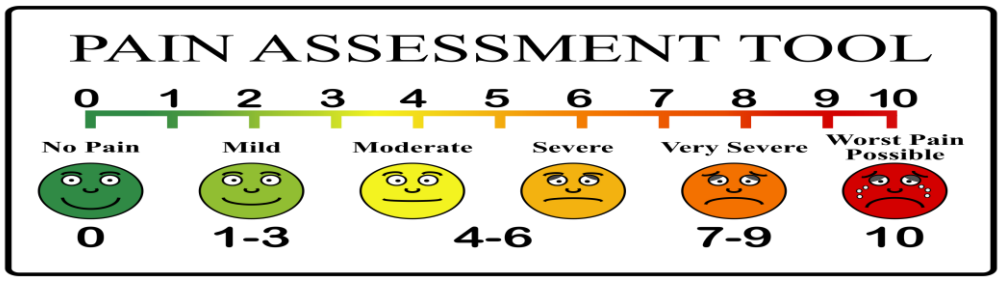
- **Tools for data collection:-** ***Structured interviewing questionnaire for mother***

This tool was designed mainly to collect data related to: -Socio-demographic data such as: - mothers name, address, age, education, occupation and telephone number.

1- A follow up observation sheet : It was used for mothers in both groups used to record *postoperative physical care and performance of women* . Postoperative physical care given to the mother by the researchers in the study group immediately within two hours after the operation, three days and after two weeks, it covered the following items as positioning, checking of vital signs, recording intake and output and to record postoperative physical care given to the mother by the hospital in the control group. It was necessary to record women's practice during the postoperative period, concerning initiation of breast feeding, body cleanliness and mobilization

2- Observation checklist was constructed by the researchers to record the main outcome on which the comparison was made between the study and control group (used for both groups) include postoperative hypotension, mobilization, return of gastrointestinal function, pain control, length of hospital stay, any minor or major problems after two to four hours, three days and after two weeks. Patient record diary and pathway checklist was instituted and used for all inpatients postoperatively (study group) which includes (vital signs monitoring, early post-operative diet, respiratory care, mobilization, bladder and bowel care, Pain scoring chart….etc.

3- Visual Analogue Scale (VAS): for quantitative pain measurement. It consists of a 10-cm line anchored at each end with words such as (no pain) and (the worst pain possible) the line may be either vertical or horizontal. The exact length in cm of the segment between zero and checked point is the score of pain. The researchers used the scale that was colored by **Samy (2002)**, divided into three colors according to the degree of pain intensity; the mild pain with green, moderate pain with orange and severe pain with red to be easily understood by the parturient women.



The nursing handout was prepared and submitted to all women in the study group to increase their awareness about CS and care needed. It covered the definition, type, indication, complications, items of self care as hygiene, diet, exercises, wound care, breast feeding, and how to relive immediate minor discomforts as pain during postoperative period.

***Validity and Reliability*:** Tools were reviewed by a panel of 5experts in the field of Obstetrics and Gynecological Medicine and Nursing faculty staff to test its content validity. It involved two parts:

A- The opinions of the experts for each item were recorded on a two point scale: relevant, not relevant and clear, not clear.
B- General or overall opinion about the form.

They were requested to express their opinion and comments on the tool and provide any suggestion for any addition or omissions of items. Then necessary modifications were done. Modifications were done accordingly based on their judgment. Reliability was done by Cronbach's Alpha coefficient test which revealed that each item of the utilized tools consisted relatively homogeneous items. Statistical significance considered at p-value ≤0.05. Then necessary modifications were done, this phase was carried out in a period of two months.

Ethical consideration

All ethical issues were taken into consideration during all phases of the study: the research maintained an anonymity and confidentiality of the subjects. The researchers introduced themselves to the women and briefly explained the nature and aim of the study to every woman before participation and women were assured that the study maneuver will cause no actual or potential harm to her. Also, they were assured that professional help will be provided for her whenever needed. Women were also assured that the information obtained during the study will be confidential and used for the research purpose only.

*** Pilot study:-**

A pilot study was carried out on 10% from mother's .The main purpose of the pilot study was to test the clarity, feasibility and applicability of the tools and whether it was understandable and to determine the time needed to fill the tool. The tool was filled and collected by the researchers. The time for the completion of the questionnaire sheet ranged between 20 – 30 min. This group of women was excluded from the study sample.

Field study of this work was carried out through 4 phases:

**** Phase (1):- Interviewing schedule for the mother:-***

The researchers attended the inpatient unit from 2, 00 pm till 9, 00 PM. four times per week; this was repeated until the sample size reached 250 women. Interviewing was carried out for each subject in the two groups (study group and control group, upon admission to the inpatient unit. The researcher introduced her to the mothers and explains the aim of the study in a simple way before teaching. The researchers started the interview, which lasted about 25 minutes. The study was carried out during the period from February 2016 to April 2017. Mothers were followed –up by the researchers daily until discharge to observe maternal problems, which may arise during hospitalization. The mothers were interviewed again after discharge on the third day. During the follow – up visit observation by means of the checklist which was performed for each mother three times during the two to four hours after cesarean section on the third day and after two weeks, it was conducted at follow up visit.

**** Phase (2):- Nursing intervention booklet:-***

A nursing booklet was developed, submitted to the study group at last month of pregnancy during antennal visit. It includes the following information: the reason for cesarean section, advantages, risks, complications, immediate and extended postoperative physical and psychological care.

**** Phase (3):- Implementation phase*** :-

The first parturient women fulfilling the sample inclusion criteria were allocated to the control group and received routine care of the hospital. Then women meeting the inclusion criteria were allocated to the intervention group and received the intervention (protocol of care). Physical assessment, care provided and complications encountered were all recorded for women in both groups following the operation and according to the aforementioned schedule.

**** Phase (4):- Evaluation phase:-***

This phase started immediately after the operation where all parameters of the clinical pathway management and its effect on the postoperative outcome that are previously mentioned were noted for the comparison between the study and control group lasted for one month postoperatively, whereas the researcher followed the patient at home by calling them once a week to assess their health and any related complications.

Limitation of the study: Some women from the study sample were interviewed and did not come back for follow up some of them did not give birth in the study setting, that leading to lengthen the period of the study.

Statistical design

All statistical analyses were performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). Data were tested for normality of distribution prior to any calculations. Continuous data were expressed in mean ±standard deviation (SD) as all continuous data were normally distributed. Categorical data were expressed in number and percentage. The comparisons were determined using Student's t test for variables with continuous data and using chi-square test was used for comparison of variables with categorical data. Statistical significance was set at $p<0.05$.

III. Results

A sum of 250 mothers was included in this research. The comparison between the (intervention) and control (routine hospital care) groups regarding their socio-demographic characteristics. They had a close mean age 27.9±4.2 and 29.9±4.6 years for the study and control groups respectively. Meanwhile, the majority of women in both groups had intermediate and high level of education. Approximately more than two thirds (70.2%) of the control group were housewives compared to 35.8% in the study group. Also, the two groups had almost close crowding index and monthly income.

Table (1) shows the comparison between the study and control groups according to women vital signs at first day after the operation. Table 1 presents the baseline characteristics of vital signs variables, including the Temperature and heart rate (HR)It was observed that, there was no statistically significant difference between the both groups regarding body temperature values, whereas p value > .05. While there was a statistically significant difference between the both groups $p \leq 0.05$ regarding blood pressure among, it was pointed out that, hypotension of the systolic arterial pressure the diastolic arterial pressur was affected a greater percentage among mothers at the control group than those in the study group with a highly statistically significant difference between both groups.(P= <0.001*).

Table 2 shows that women in the study group were significantly (P=<0.001) more likely to start oral fluids within the first 10 hours after the operation compared to those in the control group (5.4 ±1.0 vs. 15.8 ±8.3 respectively). Meanwhile, the majority of them (96.8%) begun regular diet within the first 24 hours after the operation compared to those in the control group (22.8%). Difference observed is statistical significant. Sme table shows that the majority of women in the study group had started early the intake of oral fluids, in the first day after the operation compared to the control group (84.8% vs. 5.6% respectively), with a highly significant difference (P<0.0001*). Moreover, they were less likely to suffer from vomiting or being exposed to difficult elimination. Also differences observed are statistically significant ((P<0.0001*).

Table 3 demonstrates that almost two thirds of women in the study group (60.0%) had begun their first time of sitting <2 hours compared to only one fourth (25.5%) of the control group, with statistical significant difference (P=<0.001). Meanwhile, all of them started ambulation out of bed within the first 6 hours of the operation compared to only 60.7% of the control group. Also the difference observed is statistically significant (P=<0.001). Postoperative exercises that should be taught to studied women underwent CS. It reveals that almost of women (92%) in the study groups practiced the required exercises compared to only less than one tenth (4.0%) in the control group. Difference observed is statistically significant (P<0.0001*). Respiratory, leg exercises and Pelvic floor were the most common exercises, with highest percentage in the study group than the control group (90.0%, 20.0%, 08.8% vs. 20.0%, 0.0%, 0.0% respectively).

Women practices of breast feeding after cesarean section in both study and control groups , are shown in table (4). Near half of the study group (48%) early initiated breast feeding (<2 hours from C/S) compared to those in the control group (6.4%). In addition, they showed more emotional contact with their newborn babies with a statistical significant difference (P<0.0001*).

Table (5) points to a statistically significant difference between the study and control groups regarding the level of the fundus during the third day after the operation (P=0.031*). Thus more women in the study group had reached the normal level of the uterus (98.4%) compared to those in the control group (92.8%). While, the blood loss was partially similar in both groups with no statistical significant difference.

Table (6) demonstrates that the great majority of women in the study group had mild pain grade in the third day after the operation compared to the control group (92.0% vs. 4.0% respectively) Thus they showed lesser need for analgesia (1.9 ±1.1 vs. 2.4 ±0.9 respectively) with a statistical significant difference ((P<0.0001*).

According to table (7), women in the study group were less likely to have shorter mean period for suture removal than the control group, but with no statistical significant difference (7.3±0.6 and 7.4±0.6 days, respectively). However, the control group had a statistically higher mean (P<0.0001*) period of hospitalization (1.8±0.6 days) than the study group (1.2±0.5 days).

Table (8) compares the problems encountered among women underwent CS in both the study and control groups during the follow up schedule. It indicates that the overall incidence of It was noticed that, both nausea and vomiting as a signs of hypotension were greatly found among mothers at the control group, they were represented as 83.6% & 38.4% respectively compared to 60.9% & 24.0% among mothers in study group whereas p value < 001**; DVT (0.0 %vs. 2.4 %),retention of urine was higher (0.0%) in the control group than the study group (1.6%) with a highly significant difference (P=0.49). regarding; sub-involution of the uterus (1.6vs.0.0) vaginal bleeding (0.8vs.4.4), breast problems (12.8 % vs4.8 %) In addition DVT (0.0 %vs. 4.8%) abdominal distension and constipation (32.8% vs. 73.6%) and hemorrhoids in the first day. Differences observed are statistically significant ((P<0.0001*)**.**

comparing the problems encountered among women underwent CS in both the study and control groups during the follow up schedule at 2 weeks. It indicates there was a statistically significant difference (P=0.47) between the study and control groups in favor of the former regarding; Wound infection and puerperal sepsis (0.0 %vs. 0.8 %), constipation & and hemorrhoids (4.0 vs.0.8). Differences observed are statistically significant ((P<0.0001*)**.**Outcomes of intervention on maternal health at 3 months after delivery among women in the study and control groups. It was noticed that, Mean acute episodes requiring clinic visit of mothers were greatly found among mothers at the control group, they were represented as 4.19 ± 1.14 compared to 3.66 ± 1.17% among mothers in the study group whereas p value < 0101**.**

Table (1): Vital signs among women in the study and control groups on first day after CS operation

Vital signs	A Group (n=125)	B Group (n=125)	Test of sig	P
Temperature Min. – Max. Mean ± SD.	36.20 – 38.80 37.0 ± 0.41	36.20 – 38.80 37.01 ± 0.42	t=0.175	0.861
Respiratory rate Mean ± SD.	23.9±0.9	23.8±1.2	Z=0.266	P=0.791
HR Min. – Max. Mean ± SD.	70.0 – 88.0 77.54 ± 3.30	70.0 – 89.0 79.08 ± 4.44	t=2.931*	0.004*
Hypotension of S.A.P Min. – Max. Mean ± SD.	90.0 – 100.0 94.85 ± 4.76	80.0 – 95.0 83.19 ± 3.75	t=12.674*	<0.001*
Hypotension of D.A.P Min. – Max. Mean ± SD.	60.0 – 60.0 60.0 ± 0.0	40.0 – 60.0 48.35 ± 4.33	t=25.243*	<0.001*

T, p: t and p values for **Student t-test** for comparing between the two groups*: Statistically significant at $p \leq 0.05$

Note. (SAD = systolic arterial pressure; DAP = diastolic arterial pressure)

Table (2): Distribution of the Studied Women According to their Postoperative Nourishment and *output* (n=250)

Variables		A Group (n=125)		B Group (n=125)		Chi square test	
		No.	%	No.	%	X^2	P
Initiation of oral fluids (hours)							
less than 4		75	60.0	7	6.0		
4 – 20		50	40.0	59	47.0		
>20		0	0.0	59	47.0	48.913	<0.001
Mean ±SD		5.4 ±1.0		15.8 ±8.3		9.279*	<0.001
Initiation of regular diet (hours)							
<12		43	34.4	4	3.2		
12 – 24		78	62.4	25	19.6		
>24		4	3.2	96	77.2	70.862	<0.001
Mean ±SD		14.6 ±5.2		37.3 ±17.9		9.154*	<0.001
Vomiting							
1st day	Vomitus	30	24.0	48	38.4	45.332	<0.001
3rd day	Vomitus	0	0.0	2	1.6		
2weeks	Vomitus	0	0.0	2	1.6		
Elimination							
1st day	None	122	97.6	125	100.0	MCP=0.219	<0.001
	Difficult	1	0.8	0	0.0		
	Easy	2	1.6	0	0.0		
3rd day	None	4	3.2	1	0.8	MCP<0.0001*	<0.001
	Difficult	64	51.2	122	97.6		
	Easy	57	45.6	2	1.6		
2Weeks	None	0	0.0	3	2.4	MCP=0.189	<0.001
	Difficult	8	6.4	10	8.0		
	Easy	117	93.6	112	89.6		

X^2: Chi-Square test FEP: Fisher's Exact test MCP: Monte Carlo test * Significant at P ≤0.05
-NA-: Not applicable #Categories are not mutually exclusive

Table (3): Distribution of the Studied Women According to their ambulation during postoperative period (n=250)

Variables	A Group (n=125)		B Group (n=125)		Chi square test	
	No.	%	No.	%	X^2	p
First time of sitting "hours"						
<2	75	60.0	31	25.0		
2 – 4	50	40.0	65	52.0		
>4	0	0.0	29	23.0	22.294	<0.001
Mean±SD	2.3 ±0.7		3.8 ±1.5		5.097*	<0.001
First time of ambulation out of bed						
<6	125	100	75	60.0		
6 – 12	0	0.0	43	34.4		
>12	0	0.0	7	5.6	27.378	<0.001
Mean±SD	4.0 ±0.8		6.8 ±3.6		5.712*	<0.001
Practice exercise after cesarean section						
No	10	8.0	130	96.0	212.962	<0.001
Yes	115	92.0	5	4.0		
Type of exercises	**[n=125]**		**[n=10]**			
Respiratory exercise	113	90.4	2	20.0	103.306	<0.001
Walking exercise	107	85.6	8	80.0		
Leg exercise	20	16.0	0	0.0		
Pelvic floor exercises (kajel Ex)	1	0.8	0	0.0		

X^2: Chi-Square test * Significant at P ≤0.05

Table (4): Women practices of breast feeding after cesarean section in both study and control groups (n=250)

Results of observation	Group				Significance
	A group (n=125)		B group (n=125)		
	No	%	No	%	
Onset of breast feeding					
<2 hours from C/S	60	48.0	8	6.4	X^2=103.306 (P<0.0001*)
2+ hours from C/S	57	45.6	103	82.4	
No breast feeding	8	6.4	14	11.2	
Onset of emotional contact					
No contact	8	6.4	87	69.6	X2=1.211 (P=0.41)
<2 hours from C/S	92	73.6	10	8.0	
2+ hours from C/S	25	20.0	28	22.4	

X2: Chi-Square test * Significant at P ≤0.05

Table (5): Uterine condition of post cesarean section women in the study and Control groups (n=250)

Results of observation		Group				Significance
		A(n= 125)		B (n=125)		
		No	%	No	%	
Uterus condition						
1st day	Contracted	121	95.2	117	93.2	X^2=1.211
	Un-contracted	6	4.8	8	6.8	P=0.41
3rd day	Contracted	125	100.0	122	97.6	FEP=1.0
	Un-contracted	0	0.0	3	2.4	P=0.021*
2Weeks	Contracted	125	100.0	123	98.4	FEP=1.0
	Un-contracted	0	0.0	2	1.6	P=0.031*
Funds level condition						
1st day	Normal	121	95.2	117	93.2	X2=1.211
	abnormal	6	4.8	8	6.8	P=0.41*
3rd day	Normal	125	100.0	122	97.6	FEP=1.0
	Abnormal	0	0.0	3	2.4	P=0.021*
2Weeks	Normal	125	100.0	123	98.4	FEP=1.0
	Abnormal	0	0.0	2	1.6	P=0.031*
Blood loss (pads/ day)	**No of pads**					
1st day	2-3	44	35.2	38	30.4	MCP=0.174
	4-5	81	64.8	84	67.2	
	5+	0	0.0	3	2.4	
3rd day	2-3	117	93.2	121	95.2	X^2=0.26
	4-5	8	6.8	6	4.8	P=0.608
2Weeks	2-3	125	100.0	123	98.4	FEP=1.0
	4-5	0	0.0	2	1.6	P=0.031*

X^2: Chi-Square test FEP: Fisher's Exact test MCP: Monte Carlo test * Significant at P ≤0.05

Table (6): Pain experienced by women in the study and control groups on the first, third, and seven day (n=250)

Level of pain	Group				Significance
	A(n= 125)		B(n=125)		
	No	%	No	%	
1st day					
Mild	28	22.4	7	5.6	X^2=45.332
Moderate	73	59.2	40	32.0	P<<0.001*
Severe	23	18.0	78	62.4	
3rd day					
Mild	114	91.2	5	4.0	X^2=193.18
Moderate	10	8.0	108	85.4	P<0.001*
Severe	1	0.8	12	9.6	
2Weeks					FEP=0.029
Mild	123	98.4	117	93.6	P<0.0001*
Moderate	2	1.6	8	6.4	
Medications for analgesia					
1st day	1 – 2	125	100.0	125	100.0	X^2=6.146
	3 – 4		21.3		40.0	P<0.0001*
	None	5	4.0	2	1.6	
3rd day						
	1 – 2	10	8.0	123	98.4	X^2=2.976
	3 – 4	118	94.4	125	100.0	P<0.084
	None	0	0.0	1	0.8	
2 weeks						
	1 – 2	0	0.0	5	4.0	FEP=0.029*
	None	0	0.0	2	1.6	FEP=0.498

X^2: Chi-Square test FEP: Fisher's Exact test * Significant at P ≤0.05

Table (7): sutures removal and length of hospital stay among women in the study and control group (n=250)

Results of observation	Group				Significance
	A (n=125)		B (n=125)		
	No	%	No	%	
The period of suture removal (days) Mean ± SD	7.3±0.6		7.4±0.6		Z=1.683 P=0.092
Length of hospital stay (days) Mean ± SD	1.2±0.5		1.8±0.6		Z=4.911 P<0.0001*

Z: Mann Whitney test * Significant at P ≤0.05

Table 8: Post -cesarean complications among women in the study and control groups (n=250)

Complications	Group				Significance
	A (n= 125)		B (n=125)		
	No	%	No	%	
At 1st day#					
Nausea	76	60.9	105	83.6	X2=6.146 (P<0.0001*)
Vomiting	30	24.0	48	38.4	X2=193.14 (P<0.0001*)
Retention of urine	0	0.0	2	1.6	FEP=0.498 P<0.0001*)
Vaginal bleeding	6	4.8	8	6.8	X^2=1.211(P=0.41)
Wound bleeding	0	0.0	2	1.6	FEP=0.498(P<0.010*)
Breast engorgement	12	9.6	11	8.8	X^2=0.048 (P<0.010)
D.V.T	0	0.0	3	2.4	FEP=0.476(P<0.010)
Sub-involution	0	0.0	2	1.6	FEP=0.498(P<0.030)
Pulmonary complications	0	0.0	4	3.2	FEP=0.122(P<0.010)
Abdominal distension and Constipation	41	32.8	92	73.6	X^2=23.56 (0.0001)*
Hemorrhoids	2	1.6	5	4.0	FEP=0.446
At 3rd day#					
UTI	0	0.0	1	0.8	FEP=1.0
Wound bleeding	0	0.0	2	1.6	FEP=0.498
Breast engorgement	6	4.8	16	12.8	X^2=4.98 (0.026)*
Abscess	2	1.6	2	1.6	FEP=1.0
D.V.T	0	0.0	3	2.4	FEP=0.029*
Pulmonary complications	0	0.0	3	2.4	FEP=0.247
Constipation	28	22.4	59	47.2	X^2=13.03 (0.0001)*
Hemorrhoids	18	14.4	22	17.6	X^2=0.476 (0.49)
At 2weeks					
Breast Abscess	2	1.6	2	1.6	FEP=1.0
Wound infection	0	0.0	1	0.8	FEP=1.0
Puerperal sepsis	0	0.0	1	0.8	FEP=1.0
Constipation	12	9.6	15	12.0	FEP=0.446
Hemorrhoids	1	0.8	5	4.0	X^2=21.54 (0.0001)*
At 3Month					
Acute episodes requiring clinic visit of mothers Mean ± SD	3.66 ± 1.17		4.19 ± 1.14		t =− 2.62 P=0.010

X^2: Chi-Square test FEP: Fisher's Exact test * Significant at P ≤0.05

IV. Discussion

Clinical pathways have been shown to improve outcomes in many clinical situations. To investigate the effect of clinical pathway application of postoperative nursing care for patients undergoing elective CS on the occurrence of postoperative complications. The study could provide important baseline information for improvements in health care quality. Similarly **He, et al. (2015)** Study has been conducted with the objectives of the using clinical pathways to improve quality of care, to reduce costs and to decrease inappropriate variation in health care use.

Assessment of women's vital signs during the follow up schedule demonstrated that almost all of them had their vital signs within the normal limits. This was expected since cases with pregnancy associated diseases were among the exclusion criteria. However, fewer women in the study participants were exposed to higher temperature "during the first day after the operation" than the control group. This might be related to the nursing measure for combating fever as the use of cold compresses or the administration of oral fluids. Spinal anesthesia is undoubtedly the most popular technique of anesthesia for cesarean section. However, spinal anesthesia is associated with a high incidence of maternal hypotension **(Betrán et al 2016).**

According to the present study finding, almost two thirds of women in the study group had begun their first time of sitting <2 hours compared to only one fourth of the control group, with statistical significant difference (P=<0.001). In agreement with the previous mentioned finding **by Vlug et al., (2012)** who showed that a failure to mobilize is a common reason for ER protocol deviation and is associated with increased length of stay. Conversely, **Kim, et al.(2013)** reported that early ambulation was not associated with length of stay (LOS), ***Pilliteri (2002)*** emphasized that adequate fluid intake is important after surgery to replace blood loss from surgery and to maintain blood pressure and renal function. A nutritious diet and plenty of fluid are important for the quick recovery of women underwent CS. Also, **Gists *(2002)*& Gong, et al. (2015)** noticed that the entire study group who started early feeding had an early return of bowel function as evidenced by early passage of flatus and bowel movement.

Based on the present study finding, women in the study group were significantly (P=<0.001) more likely to start oral fluids within the first 2 hours after the operation compared to those in the control group. Less vomiting as well as easily elimination than the control group (P= <0.0001*). This is quite plausible as the trouble with several studies emphasized that early hydration (EOI) after uncomplicated CS is a safety approach that does not increase the risks of gastrointestinal complications **(Kalogera et al., (2013) ;Wijk et al.,(2014)**. It reduced the rate of ileus symptoms, mean time interval to bowel movement and duration of IV administration. Meanwhile, it causes less suffering from thirst and hunger, successful breast feeding, less side effects, postoperative wound healing, and shorter hospital stay and save cost.
Patients in the study group were more likely to have lesser mean time of first bowel sounds, first passage of flatus and first defecation after surgery. In the same line Sahar **et al., (2013)** study in Kingdom Saudi Arabian about Effect of Early Oral Hydration on Post Cesarean Outcomes reported that the experimental group significantly had earlier initiation of bowel sounds with a median value of 3 hours vs. 6.5 hours in the control group. Consequently, the bowel movement returned significantly earlier with median duration of 29 hours among the study group compared to 54 hours among the control group.

Concerning the length of stay (LOS), the present study finding has indicated that the mean duration of hospitalization in the study group was significantly shorter than those in the control group. This implies that the program was effective in improving women condition and led to early hospital discharge. This is in line with the study of ***Masoud (2012)*** in Assiut-Egypt about: Postpartum Health Problems Encountered Among Women Undergoing Cesarean Section and Nursing Implication" reported that majority women had less than 2 days period of hospitalization. Meanwhile, ***Abd El-hamid (2007*)**,**Kalogera et al., (2013) Kalogera et al., (2013)& Modesitt et al., (2016)** and, **Eva et al., (2016)** reported that fifth of women had the period of hospital stay extended to four days and more.

Barbara (2011) stated that women underwent CS are inconstant need of guidance, supporting and encouragement during the postoperative period in the areas of postoperative care, diet, exercises, wound care, and breast feeding. This is congruence with the present study results that showed a highly significant difference in favor of the study group regarding the practice of respiratory, abdominal and pelvic floor exercises after the operation **(**P= 0.002***).** Since the practice of such exercises as EBP could help in reducing postoperative complications such as; pulmonary complications, DVT and, elimination problems and genital tract displacement.

The better uterine contraction, with normal fundal level and lochia were noticed in the study group than the control group, with a significant difference between the two groups in favor of the former, this might be due to early mobilization and the practice of pelvic floor exercises. In addition, ***Robertson (2011)*** confirmed the association between the condition of the uterus during the postoperative period and the incidence of postpartum hemorrhage and puerperal infection.

Evidence has shown that improper relief of postoperative pain has harmful physiological and psychological consequences for patients, increases morbidity, mortality and re-admission for pain

management, extends hospitalization, and delays patients' return to their normal activities, with resulting increase in costs **(Brady et al., 2015).** In agreement with this **Modesitt et al.(2016)** found that the median pain scores were deceased in ERAS patients (5 compared to 3.7) in the control group p<.001 on postoperative day .

The researcher was able to early identify danger signals denoting complication among the studied women. It was expected to find out that women in the study group were less likely to experience postoperative complications compared to the control group Dehcheshmeh***, (2011)*** & ***Modesitt et al. (2016)*** noticed that complications rates reduced among the study in comparison with those in the control group. Such finding is matching with the present result where women in the study group were less likely to suffer from complications as; abdominal cramps, distension and constipation compared to those in the control group.

However **Eberhart et al. (2008)** noticed that there were no significant differences in complications rates between the two groups. Difference observed may be related to sample design and the criteria of sample selection also **Wijk. L et al., (2014)** reached the same conclusion, stating that the incidence of postoperative complications did not differ between the enhanced recovery group and the control group.

V. Conclusion

Clinical pathway was effective in improving postoperative outcomes related to early ambulation, early oral intake, and short length of stay**.**

VI. Recommendations

- The clinical pathway management which proved to be successful should be integrated in the postoperative management protocol at the study setting and in other governmental hospitals.
- Health care setting should emphasize the importance of coordination between health care members relating to the application of the evidenced key elements of clinical pathway management.
- Further research is recommended using different protocol of management with different evidence based practices, with a large sample size and in different setting.

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