



The Effect of a Nursing Rehabilitative Program on Mother's Knowledge and Practices toward Vaginal Birth After Cesarean section

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Abstract

Background: Vaginal birth after cesarean section is a planned trial by women with a history of previous cesarean section to give birth vaginally. This approach plays a pivotal role in mitigating the overall cesarean section rate, particularly for mothers with a single prior cesarean delivery. **Aim of this study:** To evaluate the effect of a nursing rehabilitative program on mothers' knowledge and practices toward vaginal birth after caesarean section. **Research design:** A quasi- experimental design **Setting:** The study conducted in the antenatal clinic at Ain Shams University hospital for Obstetrics & Gynecology. **Sample:** A purposive sample of 70 mothers were included based on inclusion criteria. **Tools:** Data collected through two tools: the first tool included socio-demographic data, obstetric history and knowledge assessment sheet and the second tool was mothers' practice of rehabilitative exercises assessment sheet. **Results:** Present study clarifies a highly significant improvement in the total knowledge and practice among the studied mothers between pre- and post-nursing rehabilitative program implementation. **Conclusion:** The nursing rehabilitative program had a positive effect on studied mothers' knowledge about vaginal birth after cesarean section and their practice of rehabilitative exercises **Recommendations:** Incorporate the nursing rehabilitative program into routine antenatal care to emphasize mothers' knowledge about the benefits of vaginal birth after cesarean and provide practical guidance for rehabilitative exercises to be in the daily routine.

Keywords: Cesarean section, Knowledge, Nursing rehabilitative program, Practice, Vaginal birth



Introduction:

Although the international healthcare community has considered the ideal rate for caesarean section (CS) to be 10–15% based on the World Health Organization statement on cesarean section rate since 2015. Caesarean section became progressively common in both developed and developing countries. Cesarean section can effectively prevent maternal and fetal mortality and morbidity when medically indicated. However, there is no evidence showing the benefits of cesarean section for women or infants without medical indication for the procedure (**Angolile et al., 2023**).

Caesarean section is an important lifesaving procedure when complications arise during pregnancy or when vaginal delivery might pose a risk to the mother or baby. However, if not medically indicated or if performed under suboptimal conditions, CS can cause maternal and fetal complications, including death. A caesarean section is performed when the obstetrician and mother feel that CS is expected to provide a better maternal and/or fetal outcome than vaginal delivery. Indications for caesarean delivery vary depending on the clinical situation, resources available for mother care, and individual physician management techniques (**Harrison et al., 2021**).

The decision to perform cesarean section therefore remains a shared decision between the physician and mother after cautiously weighing the benefits and risks of a caesarean delivery versus continuing labor, operative or spontaneous vaginal delivery. The term “Elective Caesarean Section” (ECS) should probably be eliminated because a caesarean delivery must be either “medically/obstetrically indicated” or “on maternal request” and not ever actually “elective” (**Byamugisha & Adroma, 2020**).

Caesarean section might be correlated with short-term and long-term risks. Short-term maternal risks of CS include bleeding, injury of urogenital or gastrointestinal organs, anaesthetic problems which cause most maternal deaths, postoperative infection, and an increased risk for deep venous thrombosis. In the long term, severe bleeding following uteroplacental complications such as placenta previa and placenta accreta in subsequent pregnancy are increased risks. However, newborns may face



problems like neonatal respiratory distress including transient tachypnea and persistent pulmonary hypertension (**Ngamthong & Boriboonthirunarn, 2023**).

Vaginal birth after cesarean section (VBAC) is the term applied to women who undergo a planned trial to deliver vaginally following a previous cesarean delivery. A trial of labor after cesarean section for eligible mothers with one previous cesarean section has become a preferred strategy due to increased risk of maternal complications with repeat C-section and safety of vaginal birth after cesarean section (**Ward & Roberts, 2021**).

A successful VBAC has many advantages including avoidance of abdominal surgery, decreasing the risk of haemorrhage and infections, shortens the hospital stay and decreases possible complications that result from multiple cesarean sections like blood transfusion, hysterectomy, injury of bladder or bowel and abnormal placenta implantation (**Habak & Kole., 2022**) Advantages of VBAC also include; faster recovery, increased chance of vaginal delivery in the future, fulfilling the mothers' preference, feeling satisfied and empowered in a vaginal birth, reducing the risk of maternal mortality and increased likelihood of breastfeeding at birth (**Opiyo et al., 2020**).

A rehabilitative program for VBAC women is a comprehensive, multidisciplinary approach that involves collaboration between nurses, midwives, physicians, and other healthcare professionals. The program includes prenatal education and counseling, birth planning, continuous labor support, and postpartum care. Nursing rehabilitative program aims to promote woman independence, improve quality of life, and prevent complications or readmissions to the hospital (**Gutenbrunner et al., 2021**).

Women's knowledge plays a crucial role in influencing women's choice of a VBAC birth over a repeated CS. Factors such as the feeling of failure or missing out on the experience of vaginal birth from previous pregnancies, past birth experiences, and recovery post-cesarean section contribute to this decision-making process. Additionally, information from healthcare professionals, advice from acquaintances, and consideration of the advantages, disadvantages, risks, and safety associated with both VBAC and repeated cesarean section are significant factors influenced by



women's knowledge when deciding on their preferred mode of delivery (**Davis et al.; 2020**).

Practicing regular exercise during pregnancy offers various benefits, including preventing physical and mental disorders and enhancing overall wellbeing. Physical exercise reduces the risk of complications like gestational diabetes, back pain and aiding in postpartum recovery. Kegel exercises are commonly recommended to strengthen pelvic floor muscles for childbirth, while physical therapy techniques such as stretching, relaxation techniques, pelvic floor exercises, posture correction and breathing exercises alleviate discomfort during pregnancy and prepare for vaginal birth. These interventions improve pain relief, shorten labor duration, enhance the birthing experience, and ensuring women feel more secure throughout pregnancy and delivery (**Banappagoudar et al., 2022**).

Maternity nurse plays a vital role in providing education and support to VBAC women throughout the pregnancy, labor, and postpartum periods. Maternity nurses assess the woman's physical and emotional readiness for VBAC, provide information about the benefits and risks of VBAC, as well as strategies for coping with labor pain and stress. Maternity nurses also work with VBAC women to develop a birth plan that is tailored to women' individual needs and preferences in addition to support and encouragement of the woman (**Moysiadou, 2023**).

Significance of the study:

The global caesarean section rate has been doubled in the last 15 years. Elective repeated cesarean section (ERCS) is the most significant reason contributing to the highest caesarean section rate all over the world. While a CS can be a life-saving procedure, it also includes short and long-term hazards on mothers and newborns' health (**Homer et al., 2022**).

The minister of Egyptian Ministry of Health and Population stated that according to the latest population census results issued by the Central Agency for Public Mobilization and Statistics, the average rate of cesarean sections in Egypt in 2021 reached 72%, ranking first worldwide. In contrast, Egypt was ranked third worldwide in 2014 with a rate of 51.8%. Egyptian Demographic and Health Survey (EDHS)



2014, represented nearly double the rate reported in 2008 (28%) and 2.5 times the level observed in 2005 (19 %). While the rates of increase between 2000 and 2021 exceeded sevenfold (from 10% to 72%) (**Mohamed et al., 2021**).

According to the sustainable development goals, goal 3 is (Good health and Well-being). In Egypt, special attention is directed towards woman's health in the initiative of the President of the Republic "100 million health". So, a special need for education about VBAC is required because of less chance for health care providers to provide women with adequate information due to the physician's work overload and limited time for counselling in the antenatal clinics.

An obstetric nurse as a healthcare professional has a crucial role in providing mothers candidates for VBAC with relevant and complete information about VBAC to promote mother's knowledge and practice to improving their competency in labor. the current study provides the evidence for implementing of a nursing rehabilitative program for improving mother's knowledge and practice among women planning for VBAC.

Aim of the study:

The aim of the study was to evaluate the effect of a nursing rehabilitative program on mother's knowledge and practices toward vaginal birth after caesarean section.

Research Hypothesis:

Nursing rehabilitative program toward vaginal birth after caesarean section will have a positive effect on mother's knowledge and practices.

Sample and Methods:

Design:

A quasi-experimental research design was adopted for this study.

Setting:

This study was conducted in the antenatal clinic at Ain Shams University Hospital for Obstetrics & Gynecology.

Sample:

Sample type: A purposive sample was recruited according to inclusion criteria

Inclusion criteria involved: mother free from any history of medical disease or any problems with current pregnancy, with one previous c-section, has no history of



vaginal birth, willing to have a VBAC and recognition by the obstetrician of mother's eligibility for VBAC. Mother who had any contraindication for vaginal birth were excluded.

Sample size: a total number of 70 mothers who met the inclusion criteria and accepted to participate in the study in the duration of six months of data collection.

Sampling technique: The researcher attended the antenatal clinic, selected the mothers who had one previous cesarean delivery from the booking list, then interviewed the selected mothers and investigated them for the rest of the inclusion criteria. The researcher selected a number of 94 mothers who met the inclusion criteria, but 24 mothers withdrawn from the study due to family reasons, so the total number of mothers included in the study became 70 mothers. Then the researcher contacted with the selected mothers via telephone number and "Whats App" to organize the timetable for sessions.

Tools of data collection:

Tool 1: a structured interviewing questionnaire: this tool was developed by the researcher in English and translated to simple Arabic language used to assess mothers' demographic data, obstetric history, mothers' knowledge about VBAC and mothers' practice of rehabilitative exercises. It included 4 parts as the following:

Part 1: Demographic data: This part prepared by researcher to cover personal data for the mother by 8 close ended questions which include (age, residence, educational level, occupation, and marital status) in addition to general assessment of weight and height to calculate body mass index.

Part 2: Obstetric history: This part developed by researcher to assess mothers' obstetric history, previous labor, present pregnancy in 15 close ended questions (number of gravidity, parity, abortion, and number of living children, spacing between CS and pregnancy, cause of previous CS, type of CS wound, LMB, EDD, gestational age, "presenting part, fetal weight, amniotic fluid index in last ultrasound if available", following antenatal care.

Part 3: Mothers' knowledge toward VBAC assessment sheet:

The researcher developed this part after reviewing related literature like and not



limited to (Mohamed et al., 2021) (Habak & Kole., 2022) it was to assess studied mothers' information about VBAC and collected two times (pre and post the program). This part consisted of 8 close ended questions include 51 items about definition of VBAC (1 item), factors increasing likelihood of VBAC (8 items), factors reducing likelihood of VBAC (11 items), benefits (7 items), possible risks of VBAC (8 items), contraindications (6 items), eligibility criteria (6 items), and stages of labor (4items).

Scoring system:

The scoring system of knowledge included three levels: 1 point for the answer by "don't know", 2 points for the answer by "uncertain" and 3 points for the answer by "know". Mothers' knowledge assessment sheet included 51 items. So, the mothers' total knowledge score ranged from 51 to 153 and categorized into "unsatisfactory knowledge" when achieved less than $< 60\%$ of the total score (< 92 points), "satisfactory knowledge" when achieved equal or more than $\geq 60\%$ of the total score (≥ 92 points).

Part 4: Mothers' practice of rehabilitative exercises for VBAC assessment sheet:

This sheet was developed by the researcher in a simple Arabic language to assess the actual practices of the rehabilitative exercises as reported by studied mothers. It consisted of 7 practices (Kegel exercise, squatting exercise, birth ball exercise, walking and vaginal massage, deep breathing, and progressive muscle relaxation exercises). Every exercise was evaluated by mothers' response about doing the exercise or not, number of times doing the exercise per week in addition to mother's opinion about the difficulty of the exercise.

Scoring system:

Mothers' practice of exercises as reported by studied mothers assessed by two answers, "not done" with score 1 and "done" with score 2 for every exercise separately. Scoring of studied mothers' total practice was built on their weekly practice of the seven exercises, which categorized into three categories, "don't practice" scored by 1 point, "once to three times per week" scored by 2 points, and "more than three times per week" scored by 3 points. So, the total practice score ranged from 7 to 21points and classified into "inadequate practice" when achieved less than or equal $\leq 60\%$ of the total score (≤ 13 points), "adequate practice" when



achieved more than $> 60\%$ of the total score (>13 points). Regarding mother's opinion about the difficulty of the exercise was scored in three answers, "easy and can practice it" that scored 3, "sometimes can practice it" scored 2, and "difficult and can't practice it" scored 1.

Validity:

To achieve the criteria of trust worthiness of the tools of data collection in this study, the tools were tested and evaluated for their face and content validity by a panel of three expert professors in Maternal and Newborn health nursing specialty to ascertain relevance, clarity, and completeness of the tools. The required corrections and modifications were done by adding, modifying, and rearranging some questions.

Reliability:

Reliability was estimated among 10 mothers by using the test-retest method with two weeks apart between them. Then Cronbach alpha reliability test was calculated between the two scores through SPSS computer package which indicated that the questionnaire is reliable to detect the objectives of the study.

Tool	Cronbach Alpha test
Obstetric history	0.85
Knowledge assessment sheet	0.72
Practice assessment sheet	0.79

Ethical considerations:

The research proposal approval was obtained from the Scientific Research Ethics Committee (Number 25, August 2021) at Faculty of Nursing Helwan University before conducting the study. Before carrying out the study, the researcher clarified the aim of the study and the expected outcomes to gain mothers' trust and cooperation. An informed consent of each participant to share in the study was obtained.

The mothers were assured about confidentiality and anonymity of the gathered data and were used for research purposes only and there is no physical or psychological harm. Mothers were allowed to participate or not and they had the right to withdraw from the study at any time. The researcher respected ethics, values, culture, and beliefs of mothers.

Pilot study:

A pilot study was carried out on 10% in a period of three weeks before conducting the actual study to determine the technique of mothers' selection, test the feasibility, clarity and applicability of the study tools, test relevancy and clarity of



the content in addition to estimate the time needed to fill in the tools. The pilot study revealed that some items need to be added which help in achieving the study objectives and some items needed to be modified, such as simplification and rephrasing of some questions to be simpler for understanding. So, pilot study was excluded from the study sample.

Field work:

Data collection and program implementation of this study was carried out from the beginning of December 2022 to the end of May 2023, two days per week.

Process of program implementation:

1. Designing the nursing rehabilitative program (NRP)

The nursing rehabilitative program was designed to be 7 sessions implemented through three phases where the first session was for the pre-assessment and program introduction, five educational sessions (one theoretical and four practical sessions), and the final session for conclusion and program evaluation. Designing the NRP included planning of program strategy (program aim and objectives, timetable, teaching methods, required activities for each session/exercise and evaluation methods).

a. Preparation of the content:

Plan of the NRP and the supported material (VBAC educational booklet) were prepared after reviewing of the current, past, English, Arabic, local, and international related literature. The content of the program was divided into theoretical and practical sessions in a timetable format, theoretical sessions included all information about VBAC (definition, factors increasing & factors reducing likelihood of VBAC, benefits, possible risks, contraindications, eligibility criteria and stages of labor) and the practical sessions included Kegel exercise, birth ball exercises, perineal massage, squatting exercise, walking, progressive muscle relaxation and deep breathing exercise.

b. Mothers' recruitment and allocation:

The researcher introduced herself to each mother and interviewed them individually then explained the aim of the study, obtained the agreement to participate in the study and assured studied mothers about respect of ethical considerations



throughout the study. Studied mothers were allocated into eight groups with a ratio of 8:9 mothers per group. This grouping was made to match their upcoming antenatal visit, aiming to ensure that attending the program sessions wouldn't impose an undue burden on mothers.

2. Assessment (Pre-test data collection) phase:

Studied mothers were interviewed to complete the baseline questionnaire (pre-test) before the implementation of the NRP. The researcher explained the questionnaire and the plan of the NRP, mothers' answers were recorded, and their questions were answered. This phase ranged from 20-30 minutes depending on the degree of understanding and responses of the studied mothers.

3. Implementation phase of NRP:

- This phase included conduction of the NRP sessions in a waiting area outside the antenatal clinic two days/ week. Two groups received one session per day alternatively so that each group received one session every two weeks.
- Various teaching/ learning methods used to accomplish session's objectives such as lecture, group discussion, demonstration and redemonstration.
- At the beginning of each session, the researcher revised the content of the previous session and the objectives of the new one for 5 mins, Then the researcher taught the topic of new session in (35-40) mins and made a summary in 5 mins.
- At the end of each session, mothers were allowed to ask questions and give feedback in the last 10 mins. The researcher was very careful about seeking feedback from mothers in a timely manner.
- The theoretical session included all information about the normal delivery, cesarean section and vaginal birth after cesarean section as definition, indications, contraindications, advantages, disadvantages, side effects and eligibility criteria etc.
- The four practical sessions were about Kegel exercise, squatting exercise, perineal massage, birth ball exercises, walking, deep breathing exercises and progressive muscle relaxation exercise.



- The researcher maintained simple language to meet mothers' level of understanding and researcher was very open to their questions and allowed them to express their thoughts effectively.
- During the nursing rehabilitative program sessions, the researcher gave the educational booklet to the mothers for further reading and understanding. In addition to prerecorded online lectures by the researcher to be available at any time.

4. Evaluation phase of NRP:

Studied mothers were evaluated by using the posttest tools which were the same tools of pretest. Tool for assessing mothers' knowledge was used after the end of the theoretical sessions while mother's practice assessment was reported weekly via mobile call, "Whats App" or in the next session.

Administrative items: -

Permissions for data collection and implementation of the Nursing Rehabilitative Program were obtained by submission of official letters issued from the Dean of the Faculty of Nursing, Helwan University to the Manager of Ain Shams University Hospital for Obstetrics and gynecology. The researcher met and discussed the aim and objectives of the study and the nursing rehabilitative program with the hospital administrative personnel.

Statistical items:

Data was collected and coded then the collected data were organized and analyzed using appropriate statistical significance tests using the Computer Statistical Package for Social Science (SPSS), version 21. The statistical analysis has included the arithmetic mean, standard deviation, chi square (χ^2) test and P value. Degrees of significance of results were considered as the following:

P-value > 0.05 Not significant.

P-value ≤ 0.05 Significant

P-value ≤ 0.01 Highly Significant

Results:

Table (1): Distribution of the studied mothers according to sociodemographic characteristics N =70

Socio-demographic data	No	(%)
*Age (Years)		
• Less than 20 years	0	0 %
• 20-25	14	20 %
• 26-30	55	64.3 %
• 31-35	11	15.7 %
Mean ± SD	27.84 ± 3.188	
* Place of residence		
• Urban	57	81.4 %
• Rural	13	18.6 %
* Occupation		
• Employee	18	25.7 %
• Housewife	52	74.3 %
* Marital status		
• Married	70	100 %
* General examination items		
• Weight Mean ± SD = 77.96 ± 19.382		
• Height Mean ± SD = 162.17 ± 6.336		
* Body Mass Index (BMI)		
• Underweight (<18.5)	6	8.6 %
• Normal weight (18.5-25)	26	37.1 %
• Overweight (26-30)	38	54.3 %
Total	70	100%

Table (1) indicated that nearly two-thirds 64.3 % of studied mothers were 26-30 years old, with a mean age of 27.84 ± 3.188 years. Regarding the occupation 74.3 % of studied mothers were housewives. Concerning the place of residence 81.4 % of them were urban citizens. Concerning the body mass index, 54.3 % of studied mothers were overweight.

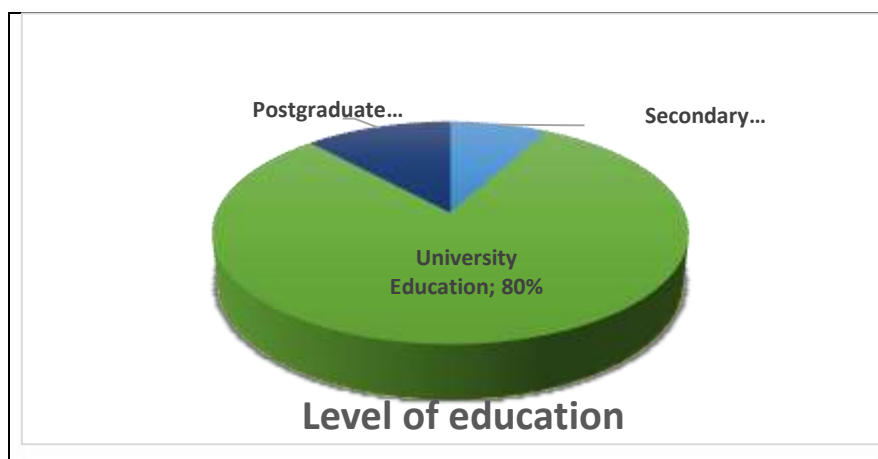


Figure (1): Distribution of studied mothers according to their level of education. (N=70)

Figure (1) shows that most of studied mothers had a university education (80%), followed by 12% of them had postgraduate studies. While the least percentage (8%) was for those who had a secondary education.

Table (2): Distribution of the studied mothers according to obstetric history (N =70).

Obstetric history	No	(%)
* Gravidity		
• Gravida (2)	48	68.6 %
• Gravida (3)	14	20 %
• Gravida (4)	6	8.6 %
• Gravida (5)	2	2.9 %
* Abortion		
• Yes	22	31.4 %
• No	48	68.6 %
* Number of Abortion		
• Abortion (1)	13	59.1 %
• Abortion (2)	7	31.8 %
• Abortion (3)	2	9.1 %
* Spacing between CS & Current pregnancy		
• From 18-24 months.	21	30 %
• From 25-36 months.	22	31.4 %
• More than 36 months	27	38.6 %
* Type of previous CS incision		
• Lower segment CS (LSCS)	70	100 %
Total	70	100%

Table (2) indicates that more than two-thirds 68.6% of the studied mothers were pregnant for two times (gravida 2). Concerning abortion, more than two-thirds 68.6 % of studied mothers didn't experience abortion, more than one-third 38.6 % of studied mothers had a space period between previous CS and the current pregnancy for more than 36 months and all the studied mothers had a LSCs incision of previous CS.

Table (3): Distribution of the studied mothers according to present pregnancy N =70.

Present pregnancy	No	(%)
* Gestational age		
• 2 nd trimester	37	52.9 %
• 3 rd trimester	33	47.1 %
* Ultrasound presenting part		
• Cephalic	54	77.1 %
• Breech	16	22.9 %

* Ultrasound fetal weight		
Mean \pm SD = 828.43 \pm 380.707		
* Following antenatal care	70	100 %

Table (3) shows that more than half 52.9% of the studied mothers were in the second trimester of pregnancy. As regards the ultrasound presenting part more than three-quarters 77.1 % of the studied mothers showed cephalic presentation with mean of the fetal weight 828.43 \pm 380.7gm and mean amniotic fluid index was 13.70 \pm 1.973 . Besides that, all the studied mothers had regular antenatal care.

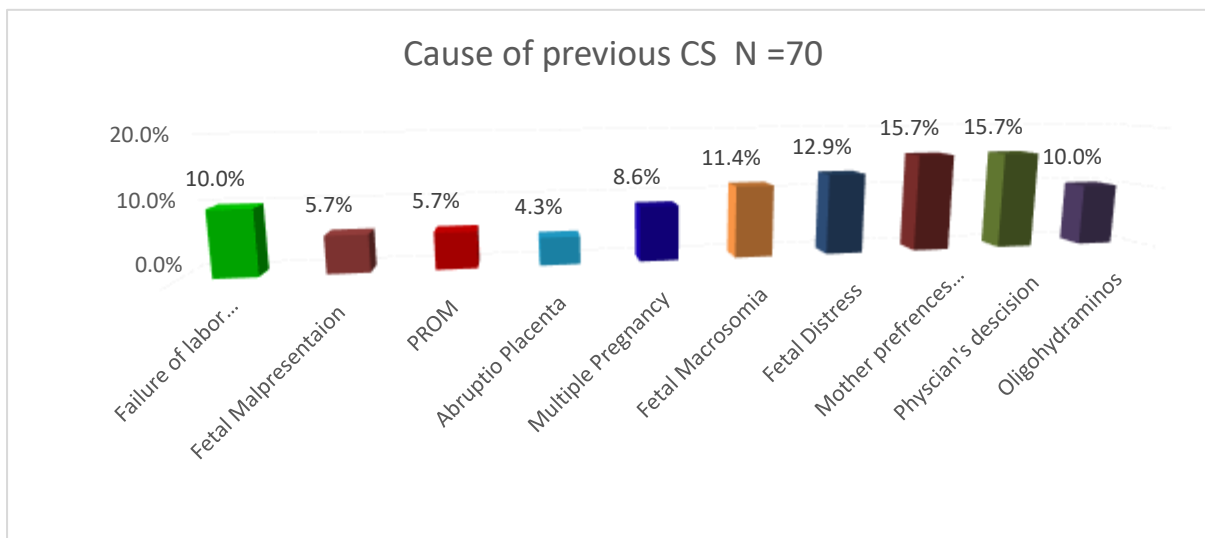


Figure (2): Distribution of studied mothers according cause of previous CS. N=70

Figure (2) reveals that the most common two causes of previous CS among studied mothers were physician's decision and mother's preferences 15.7%, followed by fetal distress and fetal macrosomia with percentage 12.9% and 11.4% respectively, while the less common cause was abruptio placenta 4.3 %.

Table (4): Distribution of studied mothers according to their knowledge regarding definition and factors increasing likelihood of VBAC pre and post the NRP (N=70).

Knowledge items	Pre						Post						X2	P-value
	Don't Know		Uncertain		Know		Don't Know		Uncertain		Know			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
VBAC is a vaginal birth following one or more previous CS.	32	45.7	23	32.9	15	21.4	0	0	31	44.3	39	55.7	38.546	0.000***
<u>Factors increasing the likelihood of VBAC:</u>														
Previous vaginal birth.	45	64.3	18	25.7	7	10	0	0	40	57.1	30	42.9	8.873	0.012*
Previous successful VBAC.	54	77.1	14	20	2	2.9	0	0	39	55.7	31	44.3	8.509	0.014*
Fetal malpresentation was indication of previous CS.	57	81.4	11	15.7	2	2.9	0	0	44	62.9	26	37.1	11.360	0.003**
Spontaneous onset of labor.	43	61.4	18	25.7	9	12.9	0	0	42	60	28	40	7.102	0.029*
A favorable cervix.	37	52.9	26	37.1	7	10	0	0	38	54.3	32	45.7	9.826	0.007**
Uncomplicated, low-risk pregnancy.	37	52.9	23	32.9	10	14.3	0	0	40	57.1	30	42.9	14.712	0.001**
A non-recurrent indication for previous CS (e.g. breech presentation).	45	64.3	15	21.4	10	14.3	0	0	44	62.9	26	37.1	6.437	0.040*
Maternal age <40 years	47	67.1	15	21.4	8	11.4	0	0	44	62.9	26	37.1	15.579	.000***

* Significance level at p<0.05

** P<0.01

***P<0.001

Table (4) illustrates that a highly statistically significant differences P<0.001 were found between studied mothers' knowledge regarding the definition of VBAC pre and post implementing the NRP. Regarding the studied mothers' knowledge about the factors increasing the likelihood of VBAC, post applying the NRP revealed a statistically significant differences in all items ranged from highly significant difference P<0.001 in "maternal age" item, followed by P<0.01 for

items" fetal malpresentation was indication of previous CS", " favorable cervix" and " uncomplicated, low-risk pregnancy" to a significance $p < 0.05$ in the items " previous vaginal birth", " previous successful VBAC" and " spontaneous onset of labor" and " non-recurrent indication for previous cesarean section".

Table (5): Distribution of studied mothers according to their knowledge regarding factors reducing likelihood of VBAC pre and post the NRP (N=70).

Factors reducing the likelihood of VBAC.	Pre						Post						X ²	P-value
	Don't Know		Uncertain		Know		Don't Know		Uncertain		Know			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
No previous vaginal birth.	46	65.7	20	28.6	4	5.7	0	0	34	48.6	36	51.4	9.324	0.009**
Previous CS because of dystocia or failure to labor progress.	45	64.3	20	28.6	5	7.1	0	0	31	44.3	39	55.7	6.527	0.038*
Previous CS was a result of failed induction.	43	61.4	23	32.9	4	5.7	0	0	32	45.7	38	54.3	8.032	0.018*
Previous CS because of cephalopelvic disproportion	39	55.7	25	35.7	6	8.6	0	0	38	54.3	32	45.7	7.940	0.019*
The need for induction of labor	42	60	21	30	7	10	0	0	34	48.6	36	51.4	4.804	0.091
Gestational age more than 40 weeks.	34	48.6	30	42.9	6	8.6	0	0	36	51.4	34	48.6	2.871	0.238
Hypertensive disorders with pregnancy	43	61.4	18	25.7	9	12.9	0	0	33	47.1	37	52.9	6.599	0.037*
Maternal Obesity (BMI > 30)	51	72.9	15	21.4	4	5.7	0	0	27	38.6	43	61.4	8.894	0.012*
Advanced maternal age (> 40 years)	44	62.9	20	28.6	6	8.6	0	0	32	45.7	38	54.3	6.216	0.045*
Current fetal macrosomia (4 kg or more)	33	47.1	31	44.3	6	8.6	0	0	29	41.4	41	58.6	6.890	0.032*
Diabetes (both gestational and pre-existing)	39	55.7	25	35.7	6	8.6	0	0	35	50	35	50	9.840	0.007**

* Significance level at $p < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table (5) reveals that studied mothers' knowledge regarding the factors reducing likelihood of VBAC post implementation of the nursing rehabilitative program, most of items have a statistically significant differences compared with the pre-program implementation knowledge except the items of " the need for induction of labor" and "gestational age more than 40 weeks" where the difference was not statistically significant (P>0.05).

Table (6): Distribution of studied mothers according to their knowledge regarding the benefits of VBAC pre and post the NRP (N=70).

Benefits of VBAC	Pre						Post						X2	P-value
	Don't Know		Uncertain		Know		Don't Know		Uncertain		Know			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
Shorter hospital stays.	39	55.7	25	35.7	6	8.6	0	0	33	47.1	37	52.9	9.840	0.007**
Faster recovery.	38	54.3	25	35.7	7	10	0	0	33	47.1	37	52.9	9.487	0.009**
Avoidance of major surgery and multiple CS in future.	47	67.1	17	24.3	6	8.6	0	0	32	45.7	38	54.3	2.723	0.256
Increased likelihood of future vaginal delivery.	38	54.3	24	34.3	8	11.4	0	0	32	45.7	38	54.3	9.176	0.010*
Maternal sense of satisfaction and empowerment.	48	68.6	16	22.9	6	8.6	0	0	34	48.6	36	51.4	8.283	0.016*
Reduced risk of maternal mortality.	42	60	22	31.4	6	8.6	0	0	35	50	35	50	9.004	0.011**
Increased likelihood of breastfeeding at birth.	45	64.3	18	25.7	7	10	0	0	32	45.7	38	54.3	9.640	0.008**

* Significance level at p<0.05

** P<0.01

***P<0.001

Table (6) shows that studied mothers' knowledge regarding the benefits of VBAC post implementation of the nursing rehabilitative program, all items have a statistically significant differences compared with their knowledge pre the program implementation except the item " avoidance of major surgery and multiple CS in future " where the difference was not statistically significant (X²=2.723) (P>0.05).

Table (7): Distribution of studied mothers according to their knowledge regarding the possible risks of VBAC pre and post the NRP (N=70).

Possible risks of VBAC	Pre						Post						X2	P-value
	Don't Know		Uncertain		Know		Don't Know		Uncertain		Know			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
Uterine rupture	45	64.3	15	21.4	10	14.3	0	0	34	48.6	36	51.4	6.971	0.03*
Infection (intrapartum chorioamnionitis)	41	58.6	22	31.4	10	14.3	0	0	32	45.7	38	54.3	7.881	0.01*
Peripartum hysterectomy	53	75.7	12	17.1	5	7.1	0	0	34	48.6	36	51.4	8.119	0.01*
Hemorrhage and blood transfusion	43	61.4	20	28.6	7	10	0	0	36	51.4	34	48.6	9.965	0.00**
Pelvic floor injury	49	70	14	20	7	10	0	0	30	42.9	40	57.1	8.500	0.01*
Surgical injuries (during emergency CS).	49	70	16	22.9	5	7.1	0	0	31	44.3	39	55.7	7.747	0.02*
Fetal hypoxic ischemic encephalopathy	44	62.9	22	31.4	4	5.7	0	0	33	47.1	37	52.9	6.246	0.04*
Risk of delivery- related fetal death	37	52.9	23	32.9	10	14.3	0	0	36	51.4	34	48.6	7.097	0.02*

* Significance level at $p < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table (7) highlights that studied mothers' knowledge regarding the possible risks of VBAC post the implementation of the nursing rehabilitative program have a statistically significant differences ($P < 0.05$) in all items compared with their knowledge pre the program implementation.

Table (8): Distribution of studied mothers according to their knowledge regarding contraindications of VBAC pre and post the NRP (N=70).

Contraindication of VBAC	Pre						Post						X2	P-value
	Don't Know		Uncertain		Know		Don't Know		Uncertain		Know			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
Previous classical or inverted 'T' uterine scar.	52	74.3	13	18.6	5	7.1	0	0	19	27.1	51	72.9	5.293	0.071
Previous myomectomy entering the uterine cavity.	36	51.4	22	31.4	12	17.1	0	0	17	24.3	53	75.7	9.381	0.009*
Previous uterine rupture.	41	58.6	20	28.6	9	12.9	0	0	16	22.9	54	77.1	7.505	0.023*
The presence of a contraindication to labor, such as placenta previa or malpresentation.	34	48.6	23	32.9	13	18.6	0	0	15	21.4	55	78.6	11.464	0.003**
Women refusing VBAC and requesting ERCS.	43	61.4	16	22.9	11	15.7	0	0	16	22.9	54	77.1	9.450	0.009**
Inability of healthcare facility to perform an emergency cesarean section.	36	51.4	27	38.6	7	10	0	0	14	20	56	80	8.426	0.015*

* Significance level at $p < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table (8) revealed that statistically significant differences were found in mothers' knowledge regarding all items of the contraindications of VBAC between pre- and post-implementation of the nursing rehabilitative program at $P < 0.05$ except " Previous classical or inverted 'T' uterine scar" item where there was not a statistical significance difference $P > 0.05$.

Table (9): Distribution of studied mothers according to their knowledge regarding eligibility criteria of VBAC and stages of labor pre and post the NRP (N=70).

Knowledge items	Pre						Post						X2	P-value
	Don't Know		Uncertain		Know		Don't Know		Uncertain		Know			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)		
Stages of labor	45	64.3	21	30	4	5.7	0	0	34	48.6	36	51.4	10.479	0.005**
First stage: dilation of the cervix	39	55.7	25	35.7	6	8.6	0	0	14	20	56	80	9.833	0.007**
Second stage: delivery of the fetus	38	54.3	21	30	11	15.7	0	0	17	24.3	53	75.7	10.784	0.007**
Third stage: delivery of the placenta	38	54.3	25	35.7	7	10	0	0	33	47.1	37	52.9	11.400	0.003**
Fourth stage: recovery (2hrs after delivery)														
Eligibility criteria of VBAC														
Vertex presentation.	49	70	15	21.4	6	8.6	0	0	30	42.9	40	57.1	8.189	0.017*
Previous low transverse uterine scar.	37	52.9	28	40	5	7.1	0	0	36	51.4	34	48.6	10.164	0.006**
Previous operative report (may include an opinion of previous obstetrician)	42	60	22	31.4	6	8.6	0	0	34	48.6	36	51.4	9.968	0.007**
No contraindications to vaginal birth.	44	62.9	20	28.5	6	8.6	0	0	28	40	42	60	11.212	0.004**
The current pregnancy's due date is at least 18 months after the prior cesarean delivery	44	62.9	19	27.1	7	10	0	0	32	45.7	38	54.3	6.502	0.039*
No more than one prior cesarean delivery	44	62.9	21	30	5	7.1	0	0	30	42.9	40	57.1	7.955	0.019*

* Significance level at $p < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table (9) clarifies that all items of the stages of labor have statistically significant differences in mothers' knowledge between pre- and post-implementation of the nursing rehabilitative program at $P < 0.01$. In addition, all items of the eligibility criteria have statistically significant differences in mothers' knowledge between pre- and post-implementation of the nursing rehabilitative program $p < 0.05$.

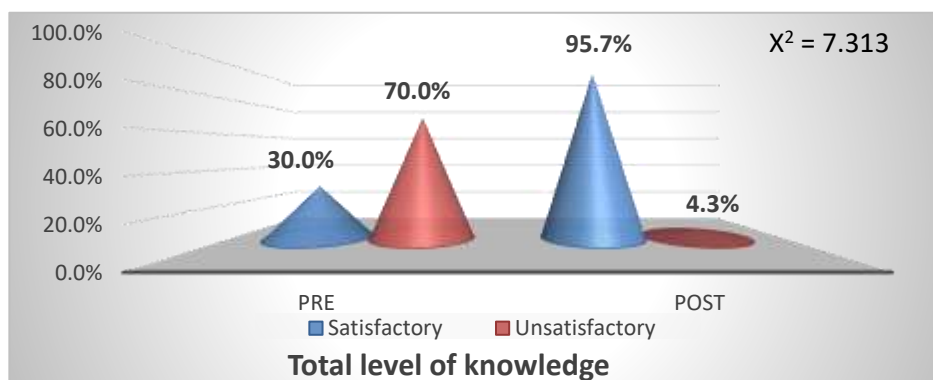


Figure (3): Distribution of total knowledge score about VBAC among studied mothers pre and post the NRP (N=70)

Figure (3) shows statistically significant differences between total level of knowledge among the studied mothers at pre- and post-nursing rehabilitative program implementation where $X^2 = 7.313$ at $P < 0.01$.

Table (8): Distribution of studied mothers according to their response regarding practicing exercises pre and post NRP (N=70).

Exercise	Pre		Post		X2	P-value
	N	(%)	N	(%)		
* Kegel exercise						
• Done	22	31.4 %	58	82.9 %	4.856	0.027*
• Not done	48	68.6 %	12	17.1 %		
* Birth ball exercise						
• Done	12	17.1 %	51	72.9 %	7.125	0.008**
• Not done	58	82.9 %	19	27.1 %		
* Squatting exercise						
• Done	29	41.4 %	57	81.4 %	17.032	0.000***
• Not done	41	58.6 %	13	18.6 %		
* Walking exercise						
• Done	48	68.6 %	61	87.1 %	4.734	0.003*
• Not done	22	31.4 %	9	12.9 %		
* Perineal massage						
• Done	12	17.1 %	30	42.9 %	4.250	0.039*
• Not done	58	82.9 %	40	57.1 %		
* Deep breathing exercise						
• Done	38	54.3 %	54	77.1 %	9.220	0.002*
• Not done	32	45.7 %	16	22.9 %		
* Progressive muscle relaxation exercise						
• Done	28	40 %	41	58.6 %	13.433	0.000***
• Not done	42	60 %	29	41.4 %		

* Significance level at $p < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table (9): Distribution of studied mothers according to their weekly practice of the exercises pre and post the NRP (N=70).

Exercise practice/ week	Pre		Post		X2	P-value
	N	(%)	N	(%)		
* Kegel exercise <ul style="list-style-type: none"> • Don't practice. • Once to 3 times per week • More than 3 times per week 	48 8 14	68.6 % 11.4 % 20 %	12 11 47	17.1 % 15.7 % 67.1 %	18.05	0.001**
* Birth ball exercise <ul style="list-style-type: none"> • Don't practice. • Once to 3 times per week • More than 3 times per week 	58 5 7	82.9 % 7.1 % 10 %	19 19 32	27.1 % 27.1 % 45.8 %	10.17	0.038*
* Squatting exercise <ul style="list-style-type: none"> • Don't practice. • Once to 3 times per week • More than 3 times per week 	41 13 16	58.6 % 18.6 % 22.8 %	13 15 42	18.6 % 21.4 % 60.0 %	14.44	0.006**
* Walking exercise <ul style="list-style-type: none"> • Don't practice. • Once to 3 times per week • More than 3 times per week 	22 11 37	31.4 % 15.7 % 52.9 %	9 12 49	13.9 % 17.1 % 70.0 %	10.68	0.030*
* Perineal massage <ul style="list-style-type: none"> • Don't practice. • Once to 3 times per week • More than 3 times per week 	58 4 8	82.9 % 5.7 % 11.4 %	30 12 28	42.9 % 17.1 % 40.0 %	14.97	0.005**
* Deep breathing exercise <ul style="list-style-type: none"> • Don't practice. • Once to 3 times per week • More than 3 times per week 	32 22 16	45.7 % 31.4 % 22.9 %	16 18 36	22.9 % 25.7 % 51.4 %	12.95	0.012*
* Progressive muscle relaxation exercise <ul style="list-style-type: none"> • Don't practice. • Once to 3 times per week • More than 3 times per week 	42 16 12	60 % 22.9 % 17.1 %	29 8 33	41.4 % 11.4 % 47.2 %	11.90	0.018*

Significance level at $p < 0.05^*$

$P < 0.01^{**}$

$P < 0.001^{***}$

) shows that a statistically significant differences were found between pre and post mothers' response toward doing all the rehabilitative exercises. Squatting exercise and progressive muscle relaxation had the highest statistical significance $P<0.001$ followed by birth ball exercise with $P<0.01$ while Kegel exercise, walking, deep breathing exercise and perineal massage had a significance $P<0.05$.

Table (9): Distribution of studied mothers according to their weekly practice of the exercises pre and post the NRP (N=70).

Exercise practice/ week	Pre		Post		X2	P-value
	N	(%)	N	(%)		
* Kegel exercise						
• Don't practice.	48	68.6 %	12	17.1 %	18.05	0.001**
• Once to 3 times per week	8	11.4 %	11	15.7 %		
• More than 3 times per week	14	20 %	47	67.1 %		
* Birth ball exercise						
• Don't practice.	58	82.9 %	19	27.1 %	10.17	0.038*
• Once to 3 times per week	5	7.1 %	19	27.1 %		
• More than 3 times per week	7	10 %	32	45.8 %		
* Squatting exercise						
• Don't practice.	41	58.6 %	13	18.6 %	14.44	0.006**
• Once to 3 times per week	13	18.6 %	15	21.4 %		
• More than 3 times per week	16	22.8 %	42	60.0 %		
* Walking exercise						
• Don't practice.	22	31.4%	9	13.9 %	10.68	0.030*
• Once to 3 times per week	11	15.7 %	12	17.1 %		
• More than 3 times per week	37	52.9 %	49	70.0 %		
* Perineal massage						
• Don't practice.	58	82.9 %	30	42.9 %	14.97	0.005**
• Once to 3 times per week	4	5.7 %	12	17.1 %		
• More than 3 times per week	8	11.4 %	28	40.0 %		
* Deep breathing exercise						
• Don't practice.	32	45.7 %	16	22.9 %	12.95	0.012*
• Once to 3 times per week	22	31.4 %	18	25.7 %		
• More than 3 times per week	16	22.9 %	36	51.4 %		
* Progressive muscle relaxation exercise						
• Don't practice.	42	60 %	29	41.4 %	11.90	0.018*
• Once to 3 times per week	16	22.9 %	8	11.4 %		
• More than 3 times per week	12	17.1 %	33	47.2 %		

Significance level at $p<0.05^*$

$P<0.01^{**}$

$P<0.001^{***}$

Table (9) reveals a statistically significant differences were found between pre and post mothers' weekly practice of all rehabilitative exercises $P<0.05$ and $P<0.01$. The pre intervention practice of Kegel exercise was 68.6% "don't practice" became 67.1% of studied mothers practice " more than 3 times/ week" as well as squatting exercise, pre intervention practice was 58.6% "don't practice" became 60 % of studied mothers practice " more than 3 times/ week".

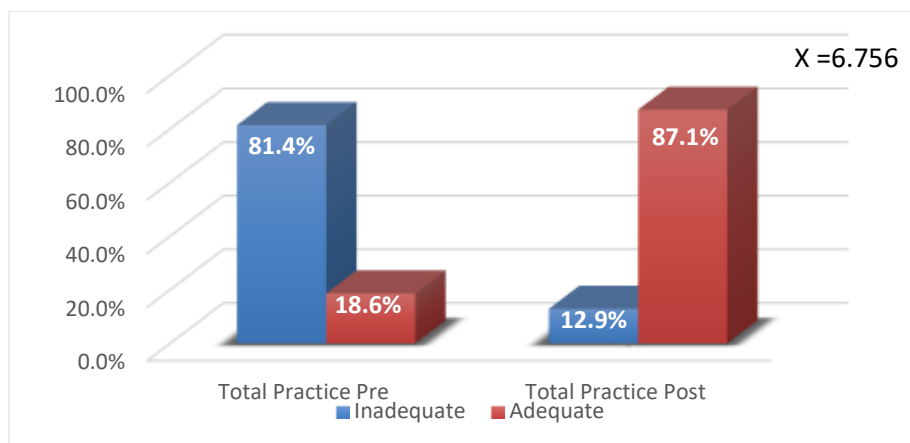


Figure (4): Distribution of total practice among studied mothers pre and post the NRP. (N=70)

Figure (4) shows a statistically significant difference between total practice of the rehabilitative exercises at pre and post implementation of the nursing rehabilitative program where $X^2=6.756$ at $P<0.01$.

Table (10): Distribution of studied mothers according to their opinion about exercises pre and post the NRP (N=70).

Mother's opinion	Pre		Post		X2	P-value
	N	(%)	N	(%)		
* Regarding Kegel exercise.						
• Easy and can practice it.	22	31.4 %	48	68.6 %	12.259	0.016*
• Sometimes can practice it.	28	40 %	17	24.3 %		
• Difficult and can't practice it	20	28.6 %	5	7.1 %		
* Regarding birth ball exercise.						
• Easy and can practice it.	22	31.4 %	51	72.9 %	11.351	0.023*
• Sometimes can practice it.	29	41.4 %	15	21.4 %		
• Difficult and can't practice it	19	27.1 %	4	5.7 %		
* Regarding squatting exercise.						
• Easy and can practice it.	22	31.4 %	51	72.9 %	16.127	0.003**
• Sometimes can practice it.	16	22.9 %	15	21.4 %		
• Difficult and can't practice it	32	45.7 %	4	5.7 %		
* Regarding walking exercises.						
• Easy and can practice it.	47	67.1 %	58	82.9 %	36.152	0.000***
• Sometimes can practice it.	17	24.3 %	7	10 %		
• Difficult and can't practice it.	6	8.6 %	5	7.1 %		
* Regarding perineal massage						
• Easy and can practice it.	13	18.6 %	30	42.9 %	15.162	0.004**
• Sometimes can practice it.	26	47.1 %	24	34.3 %		
• Difficult and can't practice it	31	44.3 %	16	22.9 %		
*Regarding deep breathing exercise						
• Easy and can practice it.	36	51.4 %	50	71.4 %	16.762	0.002**
• Sometimes can practice it.	27	38.6 %	16	22.9 %		
• Difficult and can't practice it	7	10 %	4	5.7 %		
* Regarding progressive muscle relaxation exercise						
• Easy and can practice it.	25	35.7 %	41	58.6 %	9.830	.043*
• Sometimes can practice it.	15	21.4 %	21	30 %		
• Difficult and can't practice it.	30	42.9 %	8	11.4 %		

* Significance level at $p < 0.05$

** $P < 0.01$

*** $P < 0.001$

Table (10) clarifies that there was a statistically significant difference between studied mothers' opinion regarding the feasibility of doing the rehabilitative exercises pre and post implementation of the nursing rehabilitative program. Walking exercise had the highest statistically significant difference between mothers' point of view about its feasibility before and after the program was implemented where $\chi^2 = 36.15$ at $P < 0.001$. followed by squatting exercise, perineal massage and deep breathing exercise $P < 0.01$ and the least significant difference was in Kegel exercise and progressive muscle relaxation $P < 0.05$.

Table (13): Correlation between the studied mother's total knowledge and total practice (N=70)

Items	Mean± SD	Total knowledge	
		Correlation Coefficient (r)	P-value
Total Practice	1.30+.462	0.272	0.023*

* Significant at $P \leq 0.05$

Table (13) reveals that there was a positive statistically significant correlation between the studied mother's total knowledge and total practice with p -value = 0.023.

Discussion

According to the sociodemographic characteristics of the studied mothers, the current study reveals that the majority of the studied mothers aged below 30 years old. This finding agrees with the finding of the Ireland study conducted by (Lennon et al., 2023) who reported that the majority of the studied women aged below 30 years old. However, the previous finding contradict with the Indian study conducted by (Kumari et al., 2021) who reported that majority of the women belonged to age group 30–34 years.

Concerning the place of residence, the finding of the current study shows that four fifths of the studied mothers were urban citizens. This finding agrees with the finding of the study conducted by (Nguemini et al., 2023) who reported that the majority of the studied mothers were an urban citizens.

However, this finding mismatch with the finding of the Ethiopian study conducted by (Mekonnin & Bulto, 2021) who reported that nearly two fifths of

the studied mothers were rural citizens which may return to the difference in the setting of the study.

Regarding the educational level of the studied mothers, finding of the current study reveals four fifth of studied mothers have university education. This finding is in agreement with the study conducted by (**Grylka-Baeschlin et al., 2019**) who reported that about half of the studied mothers had a university education.

Regarding gravidity of the studied mothers, the current study demonstrates that more than two thirds of the studied mothers were gravida two (the second pregnancy), While this finding corroborated by the finding of the Saudi Arabian study conducted by (**Rouzi et al., 2021**) who repeated attempts at trial of labor after cesarean birth on maternal and neonatal outcomes, and conveyed that near two thirds of the studied mothers were gravida two.

Regarding the number of abortions among studied mothers, the current study reveals that more than two thirds of the studied mothers didn't experience an abortion. This finding supported by the Ethiopian study conducted by (**Mekonnin & Bulto, 2021**) which stated that more than three quarters of the studied mothers didn't experience an abortion.

The present study result about the spacing between previous CS and current pregnancy pointed that nearly three quarters of the studied mothers had more than 24 months spacing. This finding agrees with the Scotland study conducted by (**Fitzpatrick et al., 2019**) who studied planned mode of delivery after previous cesarean section and short-term maternal and perinatal outcomes: a population-based record linkage cohort study in Scotland and reported that more than half of the studied mothers spaced between pregnancies with more than 24 months.

Regarding the gestational age, the current study reveals that more than half of the studied mothers were at the second trimester, which matches with the finding of the study conducted by (**Elmoniem et al., 2020**) and clarified that half of the studied mothers were in the second trimester of pregnancy.

All the studied mothers in the current study were regularly attending antenatal care for follow up. On the contrary the study of (**AKTAŞ et al., 2021**) entitled effect of birth ball exercising for the management of childbirth pain in Turkish women stated that nearly half of the studied mothers were irregularly attending antenatal visits. This result may be explained in the light of the awareness of the studied mothers in the current study about the importance of the antenatal care and

their interest in the trial of VBAC, so they were carefully attending, as well as the difference in study setting and subject.

The causes of previous CS finding among studied mothers of the current study illustrates that the most common two causes were either mother's preference "Elective" or physician's decision. However, Abruptio placenta was the less common cause. This finding contradict with the finding of the Saudi Arabian study conducted by (**Alkhamis, 2019**) who informed that the most common cause was failure of labor progress.

The difference of the findings regarding the cause of the previous cesarean section may be explained because in Saudi Arabia, obstetricians and hospital policies support vaginal delivery and perform caesarean section only for absolute medical indications however in Egypt CS is more applied for many reasons other than the medical indications.

Regarding the studied mothers' knowledge of the factors increasing the likelihood of VBAC, items of "maternal age", " Uncomplicated, low-risk pregnancy", " Fetal malpresentation was indication of previous CS", and " favorable cervix" followed by " previous vaginal birth", " previous successful VBAC" and " spontaneous onset of labor" and " non-recurrent indication for previous cesarean section" revealed a statistically significant differences in mothers' knowledge between pre and post applying the nursing rehabilitative program.

(**Wu et al., 2019**) who studied "factors associated with successful vaginal birth after a cesarean section: A systematic review and meta-analysis", stated based on their meta-analyses, that previous vaginal birth before CS, a previous VBAC, higher bishop score, and fetal malpresentation as the indication for previous CS were the factors associated with a successful VBAC. Which is congruent with current study finding.

Current study revealed a statistically significant differences in the studied mothers' knowledge regarding the most of items about factors reducing likelihood of VBAC after intervention of the nursing rehabilitative program when compared with the pre- program knowledge. Diabetes (both gestational and pre-existing), no previous vaginal birth. maternal obesity, previous CS because of cephalopelvic disproportion, previous CS was a result of failed induction, advanced maternal age, hypertensive disorders with pregnancy, current fetal macrosomia.

The finding of current study completed its agreement with (Wu et al., 2019) who reported that the factors associated with an un- successful VBAC included "advanced age, obesity, diabetes, hypertensive disorder complicating pregnancy, macrosomia, labor induction, cephalopelvic disproportion, dystocia , failed induction as the indication for previous CS.

Current study results show statistically significant differences between total level of knowledge among the studied mothers at pre- and post-implementation of the nursing rehabilitative program where $X^2= 7.313$ at $P<0.01$. The statistically significant difference clarifies the efficacy of the knowledge sessions in the nursing rehabilitative program which made a meaningful improvement in mothers' knowledge.

This results is in consistence with (Haji et al., 2020) conducted a study of "Impact of motivational interviewing on women's knowledge, attitude and intention to choose vaginal birth after caesarean section: a randomized clinical trial" and showed that the mean score of knowledge about VBAC in the intervention group was significantly different between the times of pre-intervention and two weeks post-intervention ($P < 0.001$) where the knowledge of pregnant women pre-intervention was moderate and reached a moderate to a good level after counseling.

The statistically significant difference between the studied mothers' knowledge pre and post intervention clarifies the efficacy of the knowledge sessions in the nursing rehabilitative program which made a meaningful improvement in mothers' knowledge regarding VBAC.

Conclusion:

Mothers who participated in the nursing rehabilitative program exhibited significant improvement in their knowledge about VBAC and practice of rehabilitative exercises after the nursing rehabilitative program's implementation as compared to before program implementation. The study results achieved the aim of the study and supported the research hypothesis that the nursing rehabilitative program toward VBAC had a positive effect on mother's knowledge and practices.

Recommendations:

- Incorporate the nursing rehabilitative program into routine antenatal care to emphasize mothers' knowledge about the benefits of vaginal birth after cesarean

and provide practical guidance for rehabilitative exercises to be in the daily routine.

- Establish postpartum support programs to educate and guide mothers post-delivery in order to reinforce the learned practices, ensuring sustained adherence to rehabilitative exercises and contributing to long-term maternal health.
- Conduct further research to explore long-term impacts and potential variations across different populations which will contribute to the continuous refinement of guidelines and practices related to VBAC rehabilitative programs.

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