Effect of Implementing Educational Program on Pregnant Women's Maternal and Neonatal Outcomes Regarding Cervical Cerclage

Noha Mohamed Ali Abdalla 1; Hoda Abd-Elazim Mohamed 2; Ghada Abdelrahman Mahmoud3

1. Clinical instructor- Technical Institute of Nursing - Faculty of Nursing - Minia University.
2. Professor of Women Health and Obstetrics Nursing- Faculty of Nursing - Minia University.
3. Professor of obstetrics and gynecological Nursing Faculty of Nursing –Assuit University.

Background: Cervical cerclage, as well named a cervical stitch, is a therapy for cervical ineffectiveness or deficiency, when the cervix begins to reduce and open too early throughout a gestation resulting in either late abortion or pre-term delivery. **Aim of the study**: to evaluates the effect of implementing educational program on pregnant women's maternal and neonatal outcomes regarding cervical cerclage. **Research design:** Quasi experimental research design was used. **Setting:** The study was conducted in outpatient departments at Minia university hospital for maternity and child health. **Subjects:** A purposive sample of (100) pregnant women under taken cervical cerclage were recruited for the current study and divided equally by using a simple random sample into intervention or study group (n=50cases) & control group (n=50cases). **Tools of data collection:** Four tools were used as follows: 1- A structured Interviewing Questionnaire, 2- knowledge Assessment tool, 3- Assessment tool for practices, 4- Assessment tool for Maternal and Neonatal outcomes. **Results** The current study reveals; that (94.0%) of the study and control groups respectively had poor knowledge regarding cervical cerclage pre-program decreased post-program, and (2%) of study and control groups had a satisfactory level of practice regarding cervical cerclage procedure preprogram, compared to (92% & 6%) of study and control groups had a satisfactory level of practice regarding cervical cerclage procedure post program. **Conclusion & Recommendations:** Implementing the educational program effectively and significantly improved pregnant women's knowledge and practice regarding cervical cerclage, Should use the educational program as one of the routine hospital cares for women undergoing cervical cerclage.
Keywords: Cervical Cerclage, Educational Program, Maternal and Neonatal Outcomes, Pregnant Women

Introduction

Cervical weakness is diagnosed through a woman's history of pregnancy losses or premature births in the second trimester, ultrasound examination or physical examination. Preventing preterm birth is a healthcare priority because it is the leading cause of infant ill health and death worldwide. A cervical stitch in combination with other treatments could help prevent preterm birth in women carrying a single baby as a single stitch may not be sufficient for pregnant women with prior premature births and short cervical length or weakness. **(Eleje, et. al., 2020)**

Cervical insufficiency is a major obstetrical complication resulting in preterm birth and subsequent neonatal morbidity and mortality; it is defined as an unexpected preterm birth during the second trimester in the absence of uterine contractions. The diagnosis of cervical insufficiency is primarily based on a past obstetrical history, and other diagnostic clues include a short cervical length on transvaginal ultrasound or a dilated cervix on a speculum examination**. (Chen, et al., 2020)**

Recurrent pregnancy loss or recurrent miscarriage is characterized as three or more consecutive pregnancy loss prior to 20 weeks from the last menstrual period. Spontaneous pregnancy loss has been estimated to be prevalent in approximately 15% of clinically diagnosed pregnancies. **(Tavoli, et al., 2018)**

Cerclage can be placed via the vaginal or trans-abdominal route, and the primary objective is to reinforce the cervix at the level of the internal os, thereby increasing the functional length of the cervix and strengthening the cervical canal. The trans-abdominal cerclage is usually reserved for patients with cervical tissues deficiency following trachelectomy or multiple cervical conizations for treatment of cervical dysplasia, and history of failed trans-vaginal cervical cerclage. **(Enakpene, et al., 2020)**

Previous studies suggest that there is a benefit in performing cerclage, since these patients present a more extended period of latency until delivery, higher gestational age at birth and a lower rate of prematurity. **(Costa, et al., 2019)**

Self-care interventions offer innovative and equitable ways to strengthen access to sexual and reproductive health services, especially in rural and low-resource settings experiencing provider shortages. **(Gülmezoglu, et al., 2020)**

Significance of the study

According to World Health Organization preterm birth affects over 15 million babies and their mothers and families worldwide, across 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born. **(WHO, 2018)** There are significant variations in preterm birth rates and mortality between countries and within countries. However, the burden of preterm birth is particularly high in low- and middle-income countries, especially those in Southeast Asia and sub-Saharan Africa. **(Walani, 2020).**

Cervical cerclage is a treatment proven to prevent preterm birth (PTB) and reduce neonatal morbidity and mortality by mechanically maintaining a long and closed cervix. **(Diacci, et al., 2021)** Cervical cerclage helps prevent miscarriage or preterm labor caused by cervical incompetence the procedure is successful in 85% to 90% of cases. Cervical cerclage appears to be effective when true cervical insufficiency**. (Yakoob, et al., 2019)**

The postoperative phase seems to be a weak link in day surgery care. From the patients' perspective, postoperative recovery following day surgery implies extensive responsibility at home. Patients need knowledge and

understanding concerning what constitutes the normal range in recovery and how to manage self-care following their specific surgical procedure. According to study done reported that the total knowledge score of studied sample regarding cerclage and self-care had correct knowledge after giving education and satisfactory self-care practice post education. **(Mohamed, A., et al.,2018)**

Aims of the study

This study undertaken to evaluates the effect of implementing educational program on pregnant women's knowledge, practice and maternal and neonatal outcomes regarding cervical cerclage.

Specific objectives:

- To assess the existing knowledge and practices of women regarding cervical cerclage.
- To design, implement and evaluate the effect of educational program on women's knowledge and practices regarding cervical cerclage.
- To evaluate the effect of an educational program on maternal and neonatal outcomes.

Research hypotheses

- **H1**: Health education program will improve women's knowledge and practices regarding cervical cerclage on posttest than pretest.
- **H1**: Women who receive educational program will have better maternal and neonatal outcomes than those who don't receive.
- **H1**: There will be significant relation between pretest knowledge and practice scores of women with their socio-demographic characteristics

Subjects and Methods
Research design:

Quasi experimental research design Pre & Posttest was utilized to fulfill the aim of this study

Setting:

This study was conducted in outpatient departments at Minia university hospital for Maternity and Child Health.

Sampling:
Sample type:

A purposive sample was recruited for the current study and divided equally by using a simple random sample into intervention or study group (n=50cases) & control group (n=50cases) in which the first case recruited as study group and second case control group and so on.

Sample size:

The sample size was (100) pregnant women, who undergoing cervical cerclage in period of six months it will be selected according to the following criteria.

Inclusion criteria

- Women diagnosed as cervical incompetent, undergoing to cervical cerclage for first time in between 12 – 24 weeks of gestation, singleton gestation.
- Free from any medical or obstetrics related disorders.

Data Collection Tools:

Tools of data collection were developed by the researchers after an extensive review of literature and similar studies conducted elsewhere; the data collection tools consisted of four tools:

Tool I. A structured Interviewing Questionnaire: it consisted of two parts:
First part: it was used to assess Socio-demographic characteristics: such as (age, educational level, residence, occupation and telephone No).
Second part: it was used to assess Obstetric History such as (gestational age, Number of pregnancies, Number of parity, and a history of abortion)

Tool II: knowledge Assessment tool (pre and posttest):
This tool was developed by the researchers after reviewing related literatures to assess women's knowledge regarding cervical cerclage It consists of **14** questions about cerclage (definition, Types, Timing, Indications, symptoms can expect after it , Complication, warning signs, signs of infection , Position in the first 24 hrs. after operation, Position after operation**)** .

Scoring system:

The women's answer related to the knowledge were scored and conducted. Each item was assigned a score of (1) given when the answer was correct, a score (0) was given when the answer was incorrect and don't know the total knowledge score (14) it is classified as, Poor knowledge if total score was < 50 % **(<7 score)**, Average knowledge if total score was 50-75% **(7 < 10.5 score)** and Good if total score was > 75%**(≥ 10.5 score).**

Tool III: Assessment tool for practices (pre and posttest):
This tool was developed by the researchers that was adopted from **(Mohamed, A., et al., 2018)** to assess women's practices regarding cervical cerclage consists of five parts containing **(42) questions** related to (Nutritional health practices, Psychological health practices , Physical heath and activity health practices, Treatment practices, Hygienic health practices) (**Nutritional health practices, (7 questions)** Take small frequent meals per day, Consume only clear fluid after operation until pass flutes etc……………)
Psychological health practices , (8 questions) Take a hot shower per day to be more relaxed, Take deep breathing exercises to feel more relaxed and reducing stress, etc……………**) Physical heath and activity health practices**, **(17 questions)** Wash hands often to decrease chance of infection, Take a warm shower or put a heating pad on abdomen may bring relief mild cram7yping after operation etc……………**) Treatment practices, (2 questions)** Taking prescribed medication in time etc……………) **Hygienic health practices**, **(8 questions)** Perform general Personal hygienic care, Take a shower or tub bath, Maintain Environmental cleanliness, etc……………) pre and post implementing the educational program .

Scoring system:

Each item done was given one score, item not done was given zero score. Total score (42) it is classified as: the total scores < 60% was considered as unsatisfactory **(0 – 25 score)** and ≥ 60% was considered satisfactory practice **(26 - 42 score).**

Noha M., et al

Tool IV: Assessment tool for Maternal and Neonatal outcomes:

It consists of two parts:

First part: to assess maternal outcomes such as (signs of Genital tract infection, Miscarriage>14 and <28 weeks, Premature rupture of membrane, etc……………)

Second part: Assessment of Neonatal outcomes: such as (delivery of a healthy baby, Delivery of a healthy baby, Delivery of still birth baby, etc……………)

Validity and Reliability:

To establish validity, the questionnaire was piloted on panel of 5 experts of obstetrics and gynecological staff and nursing professors who reviewed the instrument for clarity, relevance, comprehensiveness, understanding, applicability and easiness. The tools were tested for internal consistencies by using Cronbach's alpha test to check the stability of the internal consistency of the tools were 0.875 & 0.910, respectively

Pilot Study:

It was carried out on 10% of the total study sample (10 pregnant women undergoing cervical cerclage) in the previous setting. It was conducted to evaluate the applicability and clarity of the tools, assess the feasibility of the fieldwork, and detect any possible obstacle that might face the researcher and interfere with data collection. According to the results of the pilot study, all required and necessary modifications were done. And the women who were tested in the pilot study not included in the main study sample.

Data collection Procedure:

The current study was achieved through three phases; assessment phase (pretest), implementation (conducting the educational program), follow-up and evaluation phase.

1- **Assessment phase (pretest):**
- At the beginning of the interview, the researcher greeted each woman, explained the purpose, duration, and activities of the study. They were informed the participation in the study was voluntary, and they had the right to withdraw at any time and each participant was interviewed individually after taken their oral approval of the women to share in the study and the questionnaire is filled out by the researcher.
- After obtaining the acceptance from the women to participate in the current study, the researcher provided an overview and clarification about the assessment tools questions. The researcher interview with each woman to assess **socio-demographic data, obstetric history** the time taken to fill the questionnaire ranged from 20 – 30 minutes to be completed by using tool (**No I**). Then the researcher assesses women's knowledge and reported practices about cervical cerclage from both groups (pretest).

2- **Implementation phase (conducting the educational program):**
- After assessing pretest knowledge and reported practice regarding cervical cerclage, by using **knowledge Assessment tool** (2nd tool), **reported practices assessment tool** (3rd tool) from both groups. The researcher collected the sample through two days per week from the beginning of the study in

the period from July 2021 through December 2021. The researcher attended to outpatient clinic at 9:00 a.m., to 1:00 p.m. and face to face interview was done.
- Each woman in the study group was interviewed individually, received the knowledge and practice that should follow cervical cerclage. The educational program involved (3) sessions one session for knowledge and two sessions for practice. The duration of each session was lasted from 45 minute to one hour, three sessions per day to each woman. Also there was further 15 minutes was assigned at the end of discussion for more questions from participated women and obtains the feedback to ensure that the women got maximum benefits and the questionnaire is filled out by the researcher. Arabic booklet was distributed to all women in the study group which includes knowledge and practice about cervical cerclage.

For control group the pregnant women received the routine care of the hospital, and were followed as the same in the study group.

Follow up

The researcher was follow up the women with telephone until delivery and provide instruction to women to Calling the doctor when vaginal discharge occurs, or vaginal bleeding , or present of uterine contraction, any signs of preterm labor.

Evaluation phase:

The researcher was conduct 4 time of evaluation:
1- First time of evaluation (pretest) done before implementation of the educational program by using tools II and III to assess knowledge and practice of the pregnant women for study and control group.
2- Second time of evaluation (immediate posttest) done immediately after implementation of the educational program by using tool II to assess knowledge of the pregnant women for study group.
3- Third time of evaluation (posttest) done after two month (before delivery) using tools II, III to evaluate the effect of educational program on women knowledge and practice for both group.
4- Fourth time of evaluation done after delivery by using tool IV to evaluate the maternal ad neonatal outcomes of the pregnant women for both groups.

Supportive material:

It was designed by the researcher in the form of handout (booklet) after revising an extensive relevant literature review. It was written in a simple Arabic language and different illustrative pictures to facilitate understanding its content to enhance the pregnant women knowledge and practice regarding cervical cerclage which positively affected the maternal and neonatal outcomes of their pregnancy, which include (definition, types, time, warning signs after cervical cerclage, Nutritional health, psychological, physical, treatment and hygienic health practice about cervical cerclage)

Administrative design

Before conducting the pilot study and the actual study, an official permission and consent were obtained from

the dean of the faculty of Nursing and the director of Minia University hospital for maternal and child. The research proposal was approved by the ethical committee in the faculty of Nursing.

Ethical consideration:

Obtaining official permission to conduct the study from the willing pregnant women after explaining the importance, goal, nature and purpose of the study and obtaining oral consent from all women, all participants have the right to refuse to participate or withdraw from the study at any time without any rationale, privacy was considered during data collection and no health hazards were present. Participants were reassured that all of their information was kept strictly confidential. To maintain their privacy, each woman was given a number instead of a name, which helped maintain anonymity.

Statistical analysis

The collected Data were summarized, tabulated, and presented using statistical package for the social science (SPSS), version (20) for statistical analysis of the data

Results

Table (1): Distribution of study sample regarding to their Socio-demographic characteristics (n=100)

Socio-demographic Characteristics	Study (n=50)		Control (n=50)		X^2	P-value
	No.	%	No.	%		
Age						
- 20 < 25	8	16	6	12	2.412	0.481
- 25 < 30	21	42	17	34		
- 30 < 35	18	36	20	40		
- 35 - 50	3	6	7	14		
Mean ± SD	28.8 ± 3.78		30.06 ± 3.43		t (1.63)	0.106
Educational Level						
- Read and write	9	18	12	24	2.19	0.533
- Preparatory	10	20	12	24		
- Secondary	10	20	12	24		
- University	21	42	14	28		
Residence						
- Rural	21	42	18	36	0.378	0.539
- Urban	29	58	32	64		
Occupation						
- Work	8	16	12	24	0.990	0.317
- Housewife	42	84	38	76		

P-value not significant

Table (1) shows distribution of studied sample according to socio-demographic characteristics. The table revealed that there is no statistically significant difference between the study and control group regarding socio-demographic characteristics
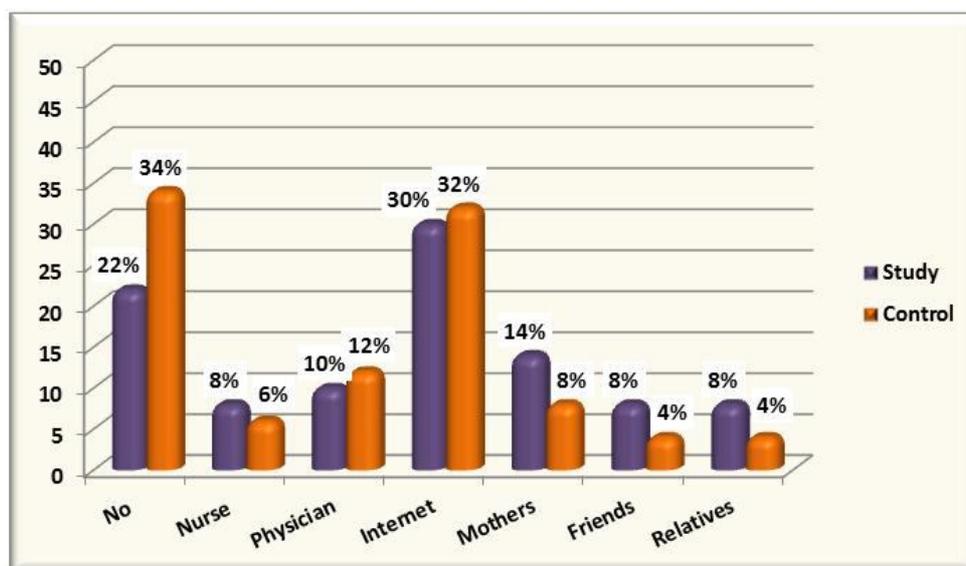
Figure (1): Distribution of study sample regarding to source of Information about cervical Cerclage (n=100)

Figure (1): illustrates that (34% & 22%) of the study and control group respectively didn't have previous knowledge about cervical cerclage, and (30.0% & 32.0%) of the remaining percentage of the study and control group respectively have their knowledge from internet resources

Table (2): Distribution of study sample regarding to their Total Knowledge Level about cervical Cerclage Pre and Post program (n=100)

Level of Knowledge	Study (n=50)						Control (n=50)				X^2 (P1 Value)	X^2 (^{MC}P2 Value
	Pretest		Immediate		Post 2 months		Pretest		Post 2 months			
	No.	%	No.	%	No.	%	No.	%	No.	%		
Poor	47	94	0	0	0	0	47	94	35	70	0.825 1.000	82.314 0.001**
Average	3	6	0	0	3	6	3	6	15	30		
Good	0	0	50	100	47	94	0	0	0	0		

P- value was calculated by Montecarlo test. *: Statistically significant at P ≤ 0.05; P1: P value for comparing between the studied groups in pretest; P 2: P value for comparing between the studied groups in post 2 months, ** P - value is highly significant

Table (2): The table revealed a highly statistical significant difference between the two groups regarding knowledge level from pre to post program, documented by P value (0.001)
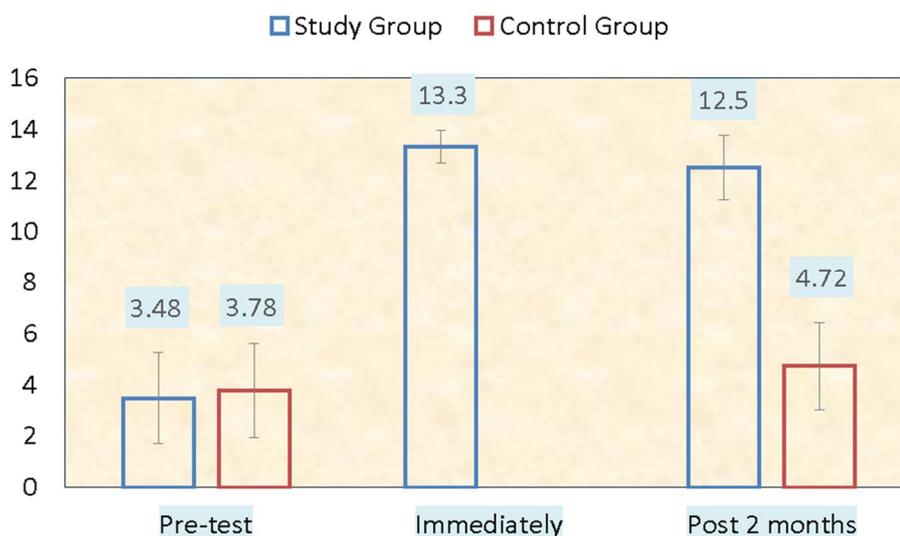
Figure (2) Illustrates that mean score of study group regarding to total knowledge about cerclage strongly improved from pre to post educational program (3.48 ± 1.77 & 12.5± 1.26) respectively. Compared to a less improvement of control group (3.78 ± 1.84 & 4.72 ± 1.69) from pre to post educational program respectively.
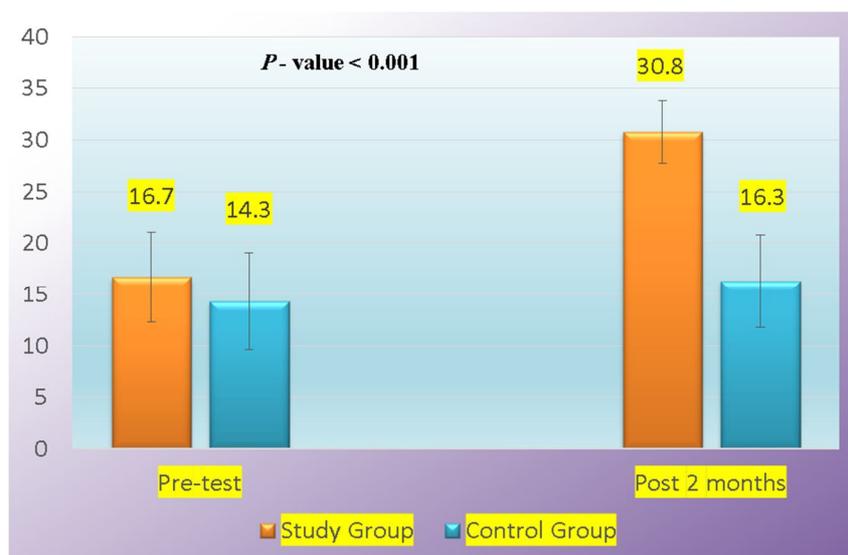
Figure (3): Mean Score of study sample regarding to their Total Practice about cervical Cerclage Pre and Post program (n=100)

Figure (3) Illustrates that mean score of study group regarding to total practice about cerclage strongly improved from pre to post educational program (16.7 ± 4.40 & 30.8 ± 3.02) respectively, Compared to control group (14.3 ± 4.73 & 16.3 ± 4.49) from pre to post educational program respectively. With a highly statistically significant differences between the two groups documented by p value 0.001

Noha M., et al

Table (3): Distribution of study sample regarding to Maternal outcomes and complications Post program (n=100)

Maternal outcomes and complications	Study (n=50)		Control (n=50)		X^2
	No.	%	No.	%	P value
Types of Complications					
- Signs of Genital tract infection	3	6	17	34	20.7 (0.001**)
- Miscarriage>14 and <28 weeks	5	10	9	18	
- Premature rupture of membrane	4	8	8	16	
- Preterm labor >14 and <37 weeks	2	4	3	6	
- Unplanned removal of cerclage	2	4	2	4	
- Vaginal bleeding	1	2	3	6	
Mode of current delivery					
- Normal vaginal delivery	11	22	9	18	1.15 (0.562)
- Elective cesarean section	39	78	41	82	

* * P- value is highly significant

Table (3): Shows that (34%) of control group had exposed to signs of genital tract infection compared to (6.0%) in the study group and (18.0%) of control group exposed to Miscarriage>14 and <28 weeks compared to (10.0%) in the study, with highly statistical significant differences between the two groups documented by P value 0.001.

Also, there was no statistical significant difference between the two groups regarding mode of current delivery

Table (4): Distribution of study sample regarding to Neonatal outcomes and complications Post program (n=100)

Neonatal outcomes and complications	Study (n=50)		Control (n=50)		
	No.	%	No.	%	P value
Neonatal outcomes					
- Delivery of a healthy baby	47	94	37	74	X^2= 14.1 (0.006**)
- Delivery of still birth baby	1	2	3	6	
- Admission to neonatal intensive care unit	2	4	10	20	
Gestational age at delivery					
- < 36 weeks	6	12	17	34	t= 2.54 (0.012*)
- > 36 weeks	44	88	33	66	
Mean ± SD	37.1 ± 1.73		35.6 ± 3.78		

*P- value is significant   **P- value is highly significant

Table (4): Evidenced that (94.0% & 74%) of study and control groups had delivered a healthy baby. And (4% & 20%) of the delivered babies among study and control groups had admitted to neonatal intensive care unit respectively, with a highly statistical significant difference between the two groups documented by P value 0.006 regarding neonatal outcomes and complications.

Also, there is a statistical significant differences regarding gestational age at delivery between the two groups documented by P value 0.012.

Table (5): correlation between Knowledge Level and Practice Level among study sample Pre and Post program (n=100)

Total practice	Total knowledge							
	Study				Control			
	Pretest		Posttest		Pretest		Posttest	
	r	p	r	p	r	P	r	p
	0.259	0.069	0.431	**0.031***	0.103	0.475	0.212	0.139

*P- value is significant

Table (5): Shows that, there was a statistically significant correlation between total knowledge level and practice level among study group subjects pre and post program documented by p value (0.031).

Table (6): Correlation between Knowledge and Practice Level with Maternal and Neonatal outcomes among study sample Post program (n=100)

Complications	Total knowledge				Total practice			
	Study		Control		Study		Control	
	r	p	r	p	r	p	R	p
Maternal	-0.838	**0.030***	0.138	0.339	0.700	**-0.050***	0.125	0.338
Neonatal	0.140	0.332	0.208	0.147	0.151	0.295	0.062	0.667

*P- value is significant

Table (6): Shows that there was a statistically significant correlation between knowledge and practice level with maternal and neonatal outcomes among both study group subjects post program documented by p value (0.030 & 0.050) respectively.

Discussion

Cervical insufficiency is directly related to PTB. Cervical insufficiency is described as an inability of a cervix to maintain pregnancy in the absence of uterine activity, labor, or both in the second trimester. If criteria have been met such as a shortened cervical length or cervical funneling measured by trans-vaginal ultrasound, a surgically placed stitch, referred to as a cerclage may be placed. Cerclages in women with prior PTB and short cervical lengths can significantly reduce composite perinatal mortality and morbidity. A cerclage can be placed elective or emergently. **(Griggs, et al. 2020)**

Regarding to the knowledge about cervical cerclage the current study illustrated that the improvement in the responses of the study group regarding knowledge about cervical cerclage after implementing educational program, **with** a highly statistical significant difference between the two groups regarding knowledge level from pre to post program, documented by P value (0.001) This improvement might be accounted to the pregnant women interested to learn and acquired knowledge about cervical cerclage as well as the written booklet that was distributed to the women and used as an ongoing reference and was helpful in women acquisition of knowledge.

This comes in agreement with **Mohamed A., et al., 2018 who** studied Effect of an Educational Intervention on Maternal and Neonatal Outcomes among Pregnant Women Undergoing Cervical Cerclage. Reported that majority of study group had adequate knowledge regarding cervical cerclage after implementing the educational intervention, while the majority of control group had inadequate knowledge. confirmed that there was highly statistically significant differences between both study and control groups regarding total knowledge score about cervical cerclage after implementing the educational intervention (P<0.001). And also come in the same line with **Mohamed, W., et al., 2019.** Who studied Educational program to enhance pregnant women's knowledge about dental care and periodontitis outcomes.in Ain Shams Maternity University Hospital, founded that there was a statistically significant difference of the studied women's knowledge about the dental care during pregnancy after the educational session and at follow up time compared to their knowledge before it (P-value <0.001). This agreement may due to that highest percentage among study and control group had a university education, women's higher level of education was associated with increase their knowledge about cervical cerclage.

On the other hand this finding not harmony with **Sharma, A., et al., 2020** who studied Knowledge and practices regarding management of minor ailments of pregnancy among antenatal mothers, founded that Almost of antenatal mothers had fair knowledge followed by more than one third had poor knowledge and only minimum percentage of women reported to have good knowledge. This deference may be due to deference between sample sizes in the current study.

Concerning to the Total Practices Level about Cerclage the current study Reveals that majority of study and control groups had an unsatisfactory level of practice regarding cerclage procedure preprogram, and almost of study had a satisfactory level of practice regarding cerclage procedure post program, with a highly statistically significant differences between the two groups documented by p value 0.001.

These results are in accordance with the study done by **Rezaie, R., et. al. 2021 who studied** the effect of self-care counseling on health practices of adolescent pregnant women: a randomized controlled trial conducted in Iran. Indicated that self-care counseling positively affects health practices and its subdomains, attitudes towards motherhood and pregnancy, after the intervention, the overall health practices score of women in the intervention group was significantly higher than those in the control group. And in the same line with **Soliman Ahmed Mohamed, S., et al., 2020** who studied Effect of Educational Program on Pregnant Knowledge and Practice Regarding How to Continue Breast Feeding after Returning to Work, in Beni- Suef University, The study indicated significant improvement in pregnant working women`s practice as regards post and follow-up tests compared to pre – test. This agreement might due to educational level was one of the important predicting factors for self-care practice among antenatal mothers and explained that antenatal mothers with a good education was associated with higher level score of their practice and enhanced their understanding and receiving of information about cervical cerclage and follow the instruction in the handout booklet.

As regarding to maternal out comes and complications the current study confirmed that more than one third of study and majority of control group exposed to maternal complications at the end of the program, and more than one third of control group had exposed to genital tract infection and less than one fifth of control group exposed to Miscarriage>14 and <28 weeks compared to small percentage of all items in the study, with highly statistical significant differences between the two groups documented by P value 0.001 Also, there was no statistical significant difference between the two groups regarding mode of current delivery.

These results are consistent with **Naim, R., et al., 2018** who studied Vaginal Progesterone versus Cervical Cerclage or Both for Prevention of Preterm Delivery in Sohag governorate founded that either vaginal progesterone only or cerclage only reduced the risk for preterm labor significantly compared to control. Moreover, combination of cerclage and vaginal progesterone resulted in higher reduction of preterm labor.

In accordance with **Moshfeghi, M., et al. 2022** who studied that Comparing the Efficacy of Pessary as an Adjunctive Therapy after Cerclage, and Cerclage Alone in Prevention of Spontaneous Preterm Birth: A Randomized Controlled Trial conducted in Tehran, Iran. Founded that maternal complications after randomization to delivery showed that, the rate of vaginal bleeding and pelvic pain (at least once) in the intervention group was significantly lower compared to the control group. This agreement might be due to positively effect of cervical cerclage in prevention of preterm labor and decrease the maternal complications that occur during pregnancy.

Regarding to Neonatal outcomes and complications the current study Evidenced that majority of study group and nearly about three quarters of control groups had delivered a healthy baby. One fifth of control group delivered babies had admitted to neonatal intensive care unit, compared minimum percentage of study group, and with a highly statistical significant difference between the two groups documented by P value 0.006 regarding neonatal outcomes and complications. Also, there is a statistical significant differences regarding gestational age at delivery between the two groups documented by P value 0.012. This constructed with **Huang,**

et al., 2021. There were no significant differences between the cerclage group and no cerclage group with respect to maternal outcomes, and neonatal complications were not significantly different between the 2 groups (all P>.05)

Concerning the correlation between Knowledge Level and Practice Level among study sample Pre and Post program the current study revealed that, there was a statistically significant correlation between total knowledge level and practice level among study group subjects pre and post program documented by p value (0.031) and regarding the Correlation between Knowledge and Practice Level with Maternal and Neonatal outcomes study sample Post program the present study showed that there was a statistically significant correlation between knowledge and practice level with maternal and neonatal outcomes among both study group subjects post program documented by p value (0.030 & 0.050) respectively. This come consistent with **Soliman Ahmed Mohamed, S., et al., 2020** who revealed that a highly statistical significance positive correlations between knowledge scores, practice and working women`s age, educational level, number of living children and field of work at the post- and follow up protocol implementation **(P< 0.001)**. This agreement might be due the having good knowledge affect positively on the self-practice after implementing educational program.

Regarding to socio-demographic characteristics, the current study showed that it was found that less than half of study and control group respectively were located in age group (30 < 35) years with mean age (28.8 ± 3.78 & 30.06 ± 3.43) years. As regards to educational level, it was found that the highest percentage among study and control group had a university education respectively, and more than half of both study and control group lived in urban areas and housewives respectively. In addition, majority of study and control group have two routine visits. There is no statistically significant difference between the study and control group regarding socio-demographic characteristics. **By contrast to Ara, A., et al., 2020** who studied Benefits of cervical cerclage in cervical incompetence outcome reported that More than half of cases 20 were between 20-29 years and less than half of cases 15 were between 30-39 years. This deference may be due to increase in sample size in the current study and change environment of study sample.

In addition, this result come in consistently with **Mohamed, A. et al.,2018** Self-Care Activities Performed by Pregnant Women and Developing a Nursing Fact Sheet as an self-care practices among the studied women. It shows that the ages of women ranged between 14-41 years. Meanwhile, about half of the studied sample was between 20 and less than 25 years, more than one fourth were less than 20 years, and only less than one fifth had a university education. Moreover, more than three fourths of women were primigravida, the rest more than one fifth had history of previous abortion. Meanwhile, the majority had their initial visit during the first trimester and more than two third had more than 4 visits.

Regarding source of information about cervical cerclage revealed that more than one third of study and less than one fourth of control group didn't have previous knowledge about cervical cerclage, and one third and more than one third of the remaining percentage of the study and control group respectively have their knowledge from internet resources, followed by low percent (from their mothers, and the minority of the study and control group respectively take their knowledge from nurses.

This come Consistent with **Soliman Ahmed Mohamed, S., et al. 2020** confirmed that the main sources of information for women were family and followed by mass media. And inconsistent with **Somaya O. et al. 2020** who studied the Effect of Health Educational Program on Knowledge, Attitude, and Reaction of Pregnant Women Regarding Obstetric and Newborn Danger Signs, revealed that more than two thirds of studied pregnant women sources of information regarding obstetrics and newborn danger signs were the doctor and the nurse, while the least source of information was relative and the internet.

Conclusion

Based on the present study finding, the study concluded that:

The Implementation of the Educational Program was effective and significantly improved Pregnant Women's Knowledge, Practice and Maternal and Neonatal Outcomes Regarding Cervical Cerclage. It found that there was a statistically significant improvement in studied pregnant women's knowledge immediately and two months after the educational program, and had better maternal and neonatal outcomes with significant differences between both groups. as well as there was statistically significant deference in studied Pregnant Women's practice pre , and post two months after Implementation of the educational program than control group.

Recommendations

In the light of present study finding, the following recommendations are suggested:

Should use the educational program as one of the routine hospital cares for women undergoing cervical cerclage

- In-service training program for maternity nurses about postoperative self-care management for pregnant women undergoing cervical cerclage.
- Replication of the present study on larger sample in different hospitals for generalizing the findings.

References

1. Ara, A., Khan, S., Akhter, M., Jahan, E., Hassan, M. A., & Khanam, F. (2020). Benefits of Cervical Cerclage to Improve Pregnancy Outcome in Cervical Incompetence. Journal of Preventive and Social Medicine, Vol. 39, Issue (2), 70-73. https://doi.org/10.3329/jopsom.v39i2.53168
2. Abd Elmoniem, S. O., Ramadan, E. A., & Sarhan, A. E. (2020). Effect of Health Educational Program on Knowledge, Attitude, and Reaction of Pregnant Women Regarding Obstetric and Newborn Danger Signs. Evidence-Based Nursing Research, 2(4), 14-14
3. Chen, C. Y., Chen, C. P., & Sun, F. J. (2020). Assessment of the cervix in pregnant women with a history of cervical insufficiency during the first trimester using elastography. Acta obstetricia et gynecologica Scandinavica, 99(11), 1497–1503. https://doi.org/10.1111/aogs.13942
4. Chun, S. H., Chun, J., Lee, K. Y., & Sung, T. J. (2018). Effects of emergency cerclage on the neonatal outcomes of preterm twin pregnancies compared to preterm singleton pregnancies: A neonatal focus. PLoS One, 13(11), e0208136.
5. Costa, M. M. F., Amorim, A. G. D., Barros, M. F. D., Rodrigues, A. S., Zugaib, M., Francisco, R. P. V., & Carvalho, M. H. B. D. (2019). Emergency cerclage: gestational and neonatal outcomes. Revista da Associação Médica Brasileira, 65, 598-602.

Noha M., et al

6. Diacci, R. C., Issah, A., Williams, K. P., McAuliffe, L., Aubin, A. M., McAuliffe, J. E., ... & Pennell, C. E. (2021). Effectiveness of combined vaginal progesterone and cervical cerclage in preventing preterm birth: a systematic review and meta-analysis protocol. BMJ open, 11(6), e050086.

7. Eleje, G. U., Eke, A. C., Ikechebelu, J. I., Ezebialu, I. U., Okam, P. C., & Ilika, C. P. (2020). Cervical stitch (cerclage) in combination with other treatments for preventing spontaneous preterm birth in singleton pregnancies. Cochrane Database of Systematic Reviews, (9).

8. Enakpene CA, Dijeh FC, Vengalil ET, Mastrogiannis D., (2020) An Over- view of the Role of Cerclage in the Prevention of Spontaneous Preterm Birth. J Reprod Med Gynecol Obstet 5: 048.

9. Griggs, K. M., Hrelic, D. A., Williams, N., McEwen-Campbell, M., & Cypher, R. (2020). Preterm labor and birth: a clinical review. MCN: The American Journal of Maternal/Child Nursing, 45(6), 328-337.

10. Gülmezoglu, A. M., Ammerdorffer, A., Narasimhan, M., Wilson, A. N., Vogel, J. P., Say, L., & Tunçalp, Ö. (2020). Self-care and remote care during pregnancy: a new paradigm?. Health research policy and systems, 18(1), 1-3.

11. Huang, X., Chen, R., & Li, B. (2021). Analysis of maternal and neonatal outcomes using cervical cerclage or conservative treatment in singleton gestations with a sonographic short cervix. Medicine, 100(18).

12. Mohamed, A. H. G. (2018) Self-Care Activities Performed By Pregnant Women and Developing a Nursing Fact Sheet as an Educational Message for Vulnerable Women. IOSR Journal Of Nursing And Health Science (IOSR-JNHS) E-ISSN: 2320–1959.P- ISSN: 2320–1940 Volume 7, Issue 2 Ver. IV (Mar-Apr .2018), PP 72-81 Www.Iosrjournals.Org

13. Mohamed, A. I., Emam, A. M. M., & Abd-Elhady, R. M. (2018) Effect of an Educational Intervention on Maternal and Neonatal Outcomes among Pregnant Women Undergoing Cervical Cerclage. IOSR Journal of Nursing and Health Science; (IOSR-JNHS) e- ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 7, Issue 2 Ver. II (Mar-Apr .(2018), PP74-87 www.iosrjournals.org

14. Mohamed, W., & Hassan, H. (2019). Educational program to enhance pregnant women's knowledge about dental care and periodontitis outcomes. ARC Journal of Nursing and Healthcare, 5(3), 23-33.

15. Moshfeghi, M., Arjmandifar, M., Mohammadi, M., Eftekhari, M., & Rezaie Keikhaie, K. (2022). Comparing the Efficacy of Pessary as an Adjunctive Therapy after Cerclage, and Cerclage Alone in Prevention of Spontaneous Preterm Birth: A Randomized Controlled Trial. Journal of Obstetrics, Gynecology and Cancer Research (JOGCR), 7(5), 382-390.

16. Naim, R. M. M., Samie, M. A., & Elkatatny, H. H. (2018). Vaginal Progesterone versus Cervical Cerclage or Both for Prevention of Preterm Delivery. The Egyptian Journal of Hospital Medicine, 71(5), 3206-3210.

17. Rezaie, R., Mohammad-Alizadeh-Charandabi, S., Nemati, F., & Mirghafourvand, M. (2021). The effect of self-care counseling on health practices of adolescent pregnant women: a randomized controlled trial. BMC Pregnancy and Childbirth, 21(1), 1-11.

18. Sharma, A., Rani, R., Nebhinani, M., & Singh, P. (2020). Knowledge and practices regarding management of minor ailments of pregnancy among antenatal mothers: a descriptive study from Rajasthan. International Journal of Community Medicine and Public Health, 7(10), 4010-16.

19. Soliman Ahmed Mohamed, S., Elsayed Awad Negm, H., A Ahmed, M., & Fawzy Elsayed Ali, H. (2020). Effect of Educational Program on Pregnant Knowledge and Practice Regarding How to Continue Breast Feeding after Returning to Work. Egyptian Journal of Health Care, 11(3), 751-763.

20. Tavoli, Z., Mohammadi, M., Tavoli, A., Moini, A., Effatpanah, M., Khedmat, L., & Montazeri, A. (2018). Quality of life and psychological distress in women with recurrent miscarriage: a comparative study. Health and quality of life outcomes, 16(1), 1-5.

21. Vasudeva, N., Reddington, C., Bogdanska, M., & De Luca, L. (2018). Emergency versus elective cervical cerclage: an audit of Our first Two years of service. BioMed Research International, 2018.

22. Walani, S. R. (2020). Global burden of preterm birth. International Journal of Gynecology & Obstetrics, 150(1), 31-33.

23. WHO, (2018) Preterm birth; http://www.who.int/en/news room/factsheets/detai l/preterm-birth.

24. Yakoob, N. K., Jamal, S. M., & Tektook, N. K. (2019). Pregnancy Outcome after Cervical Cerclage. Research Journal of Pharmacy and Technology, 12(10), 5076-5082.