

Effect of an Educational Intervention on Maternal and Neonatal Outcomes among Pregnant Women Undergoing Cervical Cerclage.

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Abstract: The aim of the study was to assess the effect of an educational intervention on maternal and neonatal outcomes among pregnant women undergoing cervical cerclage. **Design:** A quasi experimental study design was used. **Setting:** The study was conducted in gynecological outpatient unit affiliated at obstetric and gynecological department at Benha University Hospital. **Sample:** A purposive sample of 82 pregnant women undergoing cervical cerclage selected according to certain criteria and divided into two group the study group (42) and control group (40). Three **Tools** were used for data collection: A structured interviewing questionnaire sheet, self-care reported practices assessment tool and maternal and neonatal outcomes assessment tool. **Results:** revealed that the mean age of both study and control group was (27.59±7.84 & 26.49±6.54) years respectively. There was no significant difference between both groups in various socio- demographic data. There was a highly statistically significant difference in knowledge, self-care practices and maternal and neonatal outcomes in the study group compared to the control group after implementing the educational intervention $P \leq 0.001$. Moreover, there was a highly statistically significant association between total knowledge score and total self-care practices score before and after intervention. The study **Concluded** that, the educational intervention positively affect women's knowledge, self-care practices regarding postoperative cervical cerclage and had better maternal and neonatal outcomes with significant differences between both groups. There was a positive association between total knowledge and total self-care practices score before & after implementing the educational intervention $P \leq 0.001$. The study **recommended** that the educational intervention should be used as one of the routine hospital care for women undergoing cervical cerclage.

Keywords: Cervical Cerclage, Pregnant Women, Educational Intervention, Maternal And Neonatal Outcomes

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I. Introduction

Miscarriage and preterm birth (PTB) are the leading causes of maternal and neonatal morbidity and mortality worldwide and a major determinants of long-term adverse health consequences. Despite efforts to the contrary, the rate of preterm birth continues to rise globally representing a major public health priority with significant socioeconomic costs. About 70% of neonatal death and complications are due to preterm birth.[1]. The causes preterm birth are multifactorial, and often no distinct etiological factor is identified. The cervical incompetence is a well-known risk factor for preterm birth and causes about 15% of habitual abortion in 16–28 weeks [2] Cervical incompetence defined as the inability of the cervix to retain an intrauterine pregnancy to term due to functional or structural defect of the cervix result in premature birth or the loss of an otherwise healthy pregnancy, which associated with a poor fetal outcome [3]

As reported by [4] the incidence of cervical incompetence is difficult to estimate because the clinical history and physical signs are variable and subjective, also due to difficulty in registration in Egypt. It's affect only 1.0-2.0% of all pregnancies. Almost 25% of fetus miscarried in the second trimester are due to incompetent cervix. Cervical cerclage represents one of the most well-known surgical interventions in obstetrics and it's the first option for women with a history of preterm birth and short cervix less than 25 mm or women with a history or current evidence of cervical

insufficiency. The success rate can be very high (80-90%) particular when done earlier in a pregnancy [5].

Cervical cerclage is a well-known surgical procedure carried out during pregnancy. It involves positioning of a suture (stitch) material around the neck of the cervix aiming to give mechanical support to the cervix and thereby reduce risk of preterm birth [6&7]. The best time for doing cervical cerclage procedure in the third month (12-14 weeks) of pregnancy "therapeutic cerclage" however, some women may need an emergent cerclage which necessary when thinning of the cervix has already begun, the time of cerclage can also affected the outcome. Cervical cerclage has been used to treat cervical incompetence for more than 50 years, Its usually done transvaginally as first described by Shirodkar [8] and later modified by McDonald [9]. When these two procedures are unsuccessful or difficult to perform, trans-abdominal cerclage procedure is done [10].

Self-care is a basic concept in nursing care and has desirable outcomes in maintenance and promotion of women health and plays a great role in the quality of care and health outcomes. The concept of self-care described as engagement in activities to enhance wellness and health promotion. Self-care promotes health and encourages work-life balance, disease prevention and limitation [11]. Activities of self-care are divided into different types: regulatory self-care, such as eating, sleeping and bathing, preventive self-care such as exercising, dieting and brushing teeth, reactive self-care such as responding to symptoms without a physician's intervention, restorative self-care such as behavior change and compliance with treatment regimens [12].

Self-care has positive effect on women health, such as better symptoms management as reduction in pain, anxiety, rise the satisfaction, improve health and quality of life with greater independency. In addition, it has an impact on services, like hospital length of stay can be halved, outpatient visit can be reduced and medicines intake are regulated or reduced [13]. 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 on patient at home. Pregnant women undergoing cervical cerclage need knowledge and understanding concerning what constitutes the normal range in recovery and how to manage self-care following their specific surgical procedure [14].

Maternity nurses plays an important role in provision of health care for women undergoing cervical cerclage through multiple roles as care giver, counselor, educator. The nurse should provide women with information and how to manage self-care during this period, which help to seek attention early to prevent postoperative complications. After cervical cerclage nurse advice women should be in complete bed rest for 24 hours in the trendelenburg position, while the uterine activity was monitored. Also, educate the women about self-care practices to be followed, other should be avoided, inform the women should be examined weekly to ascertain the integrity of cerclage and the thread is generally removed at 38 weeks of pregnancy [15].

1.2 Significant of the study:

As reported by [4] the failure rate of cervical cerclage is about 20%, while surgical success rate affected by the postoperative activity [16]. Self-care concept is not utilized by nursing staff. Despite the self-care practices are a key concept in health promotion, increased satisfaction and an improved perception of one's health condition, also the self-care leading to lower cost for the health care system [17]. The postoperative phase seems to be a weak link in day surgery care. Postoperative care is transferred to the women and the family, who have to manage the recovery by themselves, which might raise feelings of insecurity at home. To success the recovery period the pregnant women undergoing cervical cerclage need knowledge about and an understanding concerning of the constitutes the normal range of recovery regarding their specific surgical procedure, as well as of self-care management [14]. So that this study aimed to evaluate the effect of an educational intervention on maternal and neonatal outcomes among pregnant women undergoing cervical cerclage.

1.3 Aim of the Study

This study undertaken to evaluate the effect of an educational intervention on maternal and neonatal outcomes among pregnant women undergoing cervical cerclage.

This aim was achieved through

- Assessing pregnant women's knowledge and self-care practices regarding cervical cerclage before intervention.
- Designing and implementing an educational intervention according to women's needs.
- Evaluating the effect an educational intervention on women's knowledge, self-care practices and maternal and neonatal outcomes post intervention.

1.4 Research Hypothesis:

The researchers hypothesized that the women who receive an educational intervention would expected to improve their knowledge and self-care practices regarding postoperative cervical cerclage and would have better maternal and neonatal outcomes than those who don't.

II. Subjects and Method

2.1 Research Design A quasi-experimental design was utilized to achieve the aim of the present study.

2.2 Setting: This study was conducted in gynecological unit affiliated at obstetric and gynecology department at Benha University Hospital. This Hospital located in Benha City at Qalioubia Governorate. This particular setting was chosen because it is main hospital providing care for women with different social backgrounds and high risk women also its clinical training setting for nursing students in Faculty of Nursing. This hospital started to provide care since its opening in 1981; it provides free and economical service to all patients.

2.3 Sample:

2.3.1 Sample type and criteria: Purposive sample of (82) pregnant women undergoing cervical cerclage were recruited in the study according to the following criteria: women diagnosed as cervical incompetent, undergoing to cervical cerclage for first time, singleton gestation, free from any medical or obstetrics related disorders except incompetent cervix, had telephone number for contact and accepted to participate in the study.

2.3.2 Sample size:

Sample size was calculated based on the past census of previous six months report of Benha University Hospital. The total number of pregnant women undergoing cervical cerclage was 99[18]. Sample size was calculated utilizing Yamane formula.

$$n = \frac{N}{1+N(e)^2}$$

Where:

n= sample size

N= total population number (99).

e= margin error (0.05)

2.3.3 Sample technique:

Data were collected for a period of six months, in order to avoid bias through data collection the women undergoing the cervical cerclage with previous criteria and admitted to the previous study setting for first three months from beginning of data collection were recruited at the control group (n=40) and other women with same criteria, who admitted at the second three months of data collection were recruited at the study group (n=42).

2.4 Tools of data collection:

Three tools were used for collecting data.

2.4.1 Tool I. A structured Interviewing Questionnaire Sheet: was designed by the researchers after reviewing related literature, was written in an Arabic language in the form of close and open-ended questions and encompassed two major parts:

First part: Socio-demographic data of the studied sample such as (age, educational level, residence and occupation).

Second part: Pregnant women's knowledge regarding cervical cerclage. It consisted of (8) items (definition, types, timing, indication, complication of cervical cerclage, warning signs after cerclage as (Contraction or cramping, lower abdominal or back pain, vaginal bleeding, vaginal fluid due to rupture of membrane and nausea and vomiting), signs of infection such as (fever over 100° F or greater than 38.0 c°, chills, malaise, increase heart rate, hypotension foul-smelling vaginal discharge), in addition to knowledge regarding concept of cervical cerclage self-care and importance of self-care of cervical cerclage.

Scoring system

Each item was assigned a score of (1) given when the answer was correct, a score (0) was given when the answer was incorrect. A total number of answers were 36. The mean and standard deviation was calculated. In addition, women's total knowledge score was converted into total percent and graded as the following; adequate knowledge if total score was $\geq 60\%$ and score ranged from (22-36 marks). Inadequate knowledge if total score was $<60\%$ and score ranged from (0-21 marks).

2.4.2 Tool II: Self-care reported practices assessment tool: This tool was developed by the researchers after reviewing related literatures to assess women's self-care practices regarding cervical cerclage pre and post implementing the educational intervention and consisted of (42) items about Physical health and activity health practices such as (take as much rest as possible after the cerclage, position after operation, post-operative walking, exercises, avoiding vigorous activity, avoiding lifting any heavy things, avoid prolonged sitting or standing, avoid driving a car or traveling for long distance) Nutritional health practices such as (consume only clear fluid after operation until pass flutes, after that eight light, soft food, high fiber foods and extra fluid to prevent constipation), Psychological health practices such as (relaxation, avoid stress, verbalize awareness of feelings of anxiety and learn how to deal with anxiety etc.) Treatment and follow up practices such as (take prescribed medication in time, take exactly as doctor order with some food and plenty of water to avoid its side effect on stomach, call the doctor if medicine is not helping and have side effects or allergy, follow up visit to the doctor once a week or once in 15 days is recommended and time of cerclage removal etc.) Hygienic health practices and sexual activity such as (personal hygiene, perineal self-care, avoid sitzen bath, avoid vaginal douches or tampon, put sterile preineal pad and frequently changing the pad, mouth and teeth care to avoid infection, avoid sexual intercourse for four weeks of cerclage etc.).

Scoring system

Each item was scored (0) for not done, while (1) score was given for done, The scores of total self-care practices considered satisfactory if $\geq 60\%$ and score ranged from (26-42 marks), while $< 60\%$ considered unsatisfactory and score ranged from (0-25 marks).

2.4.3 Tool III: Maternal and Neonatal outcomes assessment tool: It was concerned with assessment of maternal outcomes such as (miscarriage, preterm labor, genital tract infection, premature rupture of membrane, unplanned removal of cerclage, vaginal bleeding and cervical laceration). Neonatal outcomes including (intrauterine fetal death and admission to neonatal intensive care unit).

2.5 Method:

The study was executed according to the following steps:

2.5.1 Preparatory Phase:

The preparatory phase was the first phase of the study, the researcher carried out through review of local and international related literature about the various aspects of the research problem. This helped the researchers to be acquainted with magnitude and seriousness of the problems, and guided the researchers to prepare the required data collection tools.

2.5.2 Approvals:

An official approval to conduct the study was obtained by submission an official letter issued from the Dean of Faculty of Nursing at Benha University to the director of Benha University Hospital in order to obtain their agreement to conduct the study after explaining its purpose.

2.5.3 Tools Validity & Reliability:

Content validity was done to assure that the data collections tools measure what it was supposed to measure. Tools developed by the researchers were examined by a panel of five experts in the field of maternity nursing and obstetric medicine specialty to determine whether the included items clearly and adequately cover the domain of content addressed. The percentage of consensus among experts regarding the structured interviewing questionnaire was 92%, pregnant women's knowledge regarding cervical cerclage was 93% and self-care practices assessment tool was 83% and the pre-post-test of data collection tools were 87%. The reliability was done by test-retest was repeated to the same sample on two occasions and then compares the scores. The Cronbach's Alpha coefficient test equal was 0.859.

2.5.4 Legal Aspects for Ethical Considerations:

All ethical issues were assured, participants were given explanations about the purpose of the study, and they were also informed that they can withdraw from the study at any time before the completion of the study. Participants who agreed to complete in this study were asked to sign a consent form. Confidentiality of participants information was assured and the data were accessed only by the investigators involved in the study

2.5.5 The Pilot study:

The pilot study was carried out on 10.0% of total duration of collected data (18 days). It was conducted to evaluate the simplicity, feasibility, clarity, applicability, validity and reliability of the developed tools, also to find out the possible obstacles and problems that might face the researchers and interfere with data collection, and to estimate the time needed for data collection. According to the results of the pilot study no modifications were done. sample involved in the pilot study was excluded from the main study sample.

2.5.6 Results of the Pilot Study

After conducting the pilot study, it was found that the sentences of the tool were clear, relevant and applicable. No problem that interferes with the process of data collection was detected. The tools were reconstructed and made ready for use.

2.5.6 Procedures

The following phases were adopted to fulfill the aim of the current study; assessment, planning, implementation, and evaluation phases. These phases were carried out from the beginning of November 2016 to the end of April 2017 covering along a period of six months.

1-Assessment phase:

This phase encompassed interviewing the pregnant women undergoing cervical cerclage in both study and control group to collect baseline data, at the beginning of interview the researchers greeted each woman, explained the purpose, duration, and activities of the study. Pre-test was done to assess women's knowledge and self-care practices. The data obtained during this phase constituted the baseline for further comparison to evaluate the effect of an educational intervention. Average time for the completion of each women interview was around (20-30 minutes). To avoid cross contamination of information between both groups, control group was assessed first.

2) Planning phase:

Based on baseline data obtained from assessment phase and relevant review of literature, the educational intervention was developed by the researchers in a form of printed Arabic booklet to satisfy the studied women's deficit knowledge regarding cervical cerclage and concept of self-care

practice. The content of the educational intervention related to knowledge and self-care practices after cervical cerclage was designed to meet the following objectives:

a) General objective:

At the end of educational intervention sessions each participant in the study group should be able to acquire essential knowledge and self-care practices needed for success of cervical cerclage operation.

b) Specific objectives

After completion of the educational intervention, each woman should be able to:

1. Define the cervical cerclage
2. List indication of cervical cerclage
3. Mention the time of doing cervical cerclage
4. list the benefit of cervical cerclage
5. Recognize types of cervical cerclage
6. Determine complication of cervical cerclage
7. Explain warning signs after cervical cerclage
8. Determine time of cervical cerclage removal
9. Define concept of cervical cerclage self-care practice
10. Apply the self-care practices needed after cervical cerclage

Implementation Phase:

The researchers visited the previous mentioned setting three days/week from 9 am to 2 pm. The educational intervention involved (5) scheduled sessions. These sessions were repeated to each subgroup of (3-4) women in the study group. The duration of each session lasted from 45 minute to one hour including periods of discussion according to their achievement, progress and feedback, two session per day to each group. Also at the beginning of the first session an orientation to the educational intervention and general and specific objectives were explained. Arabic language was used to suit the women's level of understanding. Feedback was given in the beginning of each session about the previous one. Different methods of teaching were used such as modified lecture, group discussion and brainstorming. Suitable teaching media were included an educational booklet that distributed to all women in the first day of the educational intervention as well as audio-visual aids were used .

3) Follow up and Evaluation Phase:

For study group, the educational intervention was evaluated by using the same format of tools which used before intervention to evaluate pregnant women's knowledge regarding cerclage and self-care practices. Follow up were scheduled immediately postoperative cervical cerclage and extended to time after delivery to assess the effect of educational intervention on maternal and neonatal outcome using tool(3): The researchers reviewed the women medical record and asked the women as reported by themselves (self reported) if present any complaint such as (miscarriage, preterm labor, genital tract infection, premature rupture of membrane, vaginal bleeding, cervical laceration, unplanned removal of cerclage) neonatal outcome was assess for intrauterine fetal death and admission to neonatal intensive care unit.

For control group the pregnant women not receiving any education about cervical cerclage post operative self-care and were followed as the same in the study group.

2.6 Statistical Analysis

Data entry and statistical analysis was done using Statistical Packages for Social Science (SPSS) version 20. Quality control was done at the stages of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. Qualitative variables were compared using chi-square test. Statistical significance was considered at p-value <0.05, highly significant difference obtained at P<0.001 and non significant difference obtained at P > 0.05

III. Results

Table (1) Describes socio-demographic data of the studied sample. It illustrates that, less than half (45.2% & 42.5%) of study and control were in age group (26-30) years with mean age (27.59 ± 7.84 & 26.49 ± 6.54) years respectively. As regards educational level more than half (59.5%) of study group with secondary school compared with (37.5%) in control group, more than half (52.4% & 55.0%) of both groups live in rural area respectively. In addition, more than half (64.3% & 55.0%) of both groups are house wife respectively. There was no statistically significant differences among both groups with various socio-demographic characteristics.

Table (2) Reveals that, there was no statistically significant differences between both study and control groups regarding total knowledge score about cervical cerclage before implementing the educational intervention ($P > 0.05$).

Table (3) Illustrates 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 ($P < 0.001^{**}$).

Figure (1) Shows that, the majority (85.7%) of study group had adequate knowledge regarding cervical cerclage after implementing the educational intervention. While the majority (92.9%) of control group had inadequate knowledge.

Table (4) Displays that, there was no statistically significant differences between both study and control groups regarding total self-care practices score regarding cervical cerclage before implementing the educational intervention ($P > 0.05$).

Table (5) Clarifies that, there was a highly statistical significant differences between both study and control groups regarding total self-care practices score about cervical cerclage after implementing the educational intervention ($P < 0.001^{**}$).

Figure (2) Illustrates that, more than three quarter (76.2%) of study group had satisfactory self-care practices regarding cervical cerclage after implementing the educational intervention. While the majority (81.0%) of control group had unsatisfactory self-care practices.

Table (6) Shows that, there was no statistical significant differences between both study and control groups regarding total knowledge score about cervical cerclage and their age and occupation. Meanwhile, there was a highly statistical significant differences between both groups regarding total knowledge score about cervical cerclage and level of education and residence ($P < 0.001^{**}$).

Table (7) Shows that, there was highly statistically significant differences between both study and control groups regarding total self-care practices score about cervical cerclage and their age ($P < 0.001^{**}$) and statistically significant differences between both groups regarding total self-care practices score about cervical cerclage and level of education. Meanwhile, there was no statistical significant differences between both groups regarding total self-care practices score about cervical cerclage and residence and occupation ($P > 0.05$).

Table (8) Reveals that, there was a positive association between the studied sample total knowledge and total self-care practices score before implementing the educational intervention. Additionally, there was a highly statistical significant association between total knowledge and total self-care practices score after implementing the educational intervention.

Table(9) Shows that, more than half (55.0%) of control group exposed to genital tract infection compared to (14.3%) in the study group and less than half (45.0) of control group exposed to cervical laceration compared to (11.9%) in the study with highly statistical significant differences ($P < 0.001^{**}$). Meanwhile, (22.5, 32.5%, 25.0% 35.0% & 42.5%) of control group exposed to miscarriage, premature rupture of membrane, preterm labor, unplanned removal of cerclage and

vaginal bleeding respectively compared to (7.1% 9.5%,7.1%, 9.5% &14.3%) in the study group respectively with statistical significant difference between both groups (P<0.05*).

Table(10) Clarifies that, (12.5%) of control group exposed to intrauterine fetal death compared to (2.4%) in the study group. Meanwhile, about one quarter (25.0%) of neonate in control group admitted to neonatal intensive care unit compared to (7.1%) in the study group with statistical significant differences between both groups (P<0.05*).

Table (1) Distribution of the studied sample according to their Socio-demographic data (n=82).

Variable	Study group N=42		Control group N=40		χ^2	P value
	No	%	No	%		
Age/ years						
20-25	13	31.0	12	30.0	0.897	>0.05
26-30	19	45.2	17	42.5		
31-36	10	23.8	11	27.5		
Mean \pm SD	27.59 \pm 7.84		26.49 \pm 6.54			
Educational level						
Preparatory	8	19.0	9	22.5	4.65	>0.05
Secondary	25	59.5	15	37.5		
University	6	14.3	12	30.0		
Post graduate	3	7.1	4	10.0		
Residence						
Urban	20	47.6	18	45.0	0.447	>0.05
Rural	22	52.4	22	55.0		
Occupation						
Employment	15	35.7	18	45.0	0.735	>0.05
House wife	27	64.3	22	55.0		

χ^2 : Chi-Square test

Table (2) Distribution of knowledge mean scores of the studied sample regarding cervical cerclage before implementing the educational intervention (n=82).

Knowledge items	Score	Study group N=42	Control group N=40	Independent t test	P value
		Mean \pm SD	Mean \pm SD		
Definition of cervical cerclage	2	0.825 \pm 0.635	0.04 \pm 0.730	1.47	>0.05
Types of cervical cerclage	3	1.25 \pm 0.980	1.52 \pm 1.109	1.18	>0.05
Timing of cervical cerclage	2	0.52 \pm 0.678	0.73 \pm 0.857	1.25	>0.05
Indications of cervical cerclage	5	1.25 \pm 1.126	1.47 \pm 1.194	0.883	>0.05
Complication of cervical cerclage	7	2.35 \pm 1.026	2.33 \pm 1.118	0.070	>0.05
Warning signs of cervical cerclage	6	2.17 \pm 1.195	2.19 \pm 1.435	0.053	>0.05
Signs of infection	5	2.15 \pm 0.833	2.07 \pm 1.068	0.372	>0.05
Concept and importance of self-care of cervical cerclage	6	1.975 \pm 0.479	2.02 \pm 0.748	0.353	>0.05
Total knowledge score	36	12.50 \pm 3.038	13.40 \pm 3.72	1.20	>0.05

The test used independent t test. No statistical significant difference (P >0.05)

Table (3) Distribution of knowledge mean scores of the studied sample regarding cervical cerclage after implementing educational intervention (n=82).

Knowledge items	score	Study group N=42	Control group N=40	Independent t test	P value
		Mean ±SD	Mean ±SD		
Definition of cervical cerclage	2	1.69± 0.51	0.95 ± 0.74	5.18	.000**
Types of cervical cerclage	3	2.35± 0.75	1.25 ± 0.98	5.69	.000**
Timing of cervical cerclage	2	1.33 ± 0.72	0.52± 0.67	5.22	.000**
Indications of cervical cerclage	5	3.42 ± 1.30	1.22±1.09	8.27	.000**
Complication of cervical cerclage	7	5.23 ± 1.10	2.70 ± 1.38	9.17	.000**
Warning signs of cervical cerclage	6	5.14 ± 1.78	2.40 ± 1.58	9.87	.000**
Signs of infection	5	3.59 ± 1.16	2.30 ± 0.72	6.06	.000**
Concept and importance of self - care of cervical cerclage	6	4.30 ± 1.29	2.17 ± 0.44	10.05	.000**
Total knowledge score	36	27.09 ± 3.35	13.97 ± 3.78	16.57	.000**

The test used independent t test t test. **A highly statistical significant difference (p ≤ 0.001)

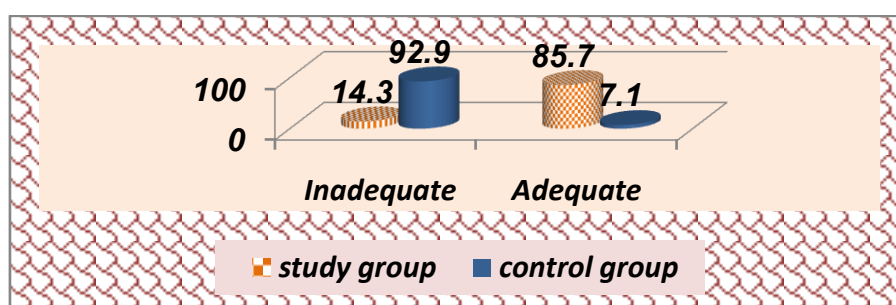


Figure 1: Distribution of the studied sample according to total knowledge scores after implementing the educational intervention (n=82).

Table (4) Distribution of self-care practices mean scores of the studied sample regarding cervical cerclage before implementing the educational intervention (n=82).

Practice items	Score	Study group N=42	Control group N=40	Independent t t test	P value
		Mean ±SD	Mean ±SD		
Nutritional health practices	8	3.725±1.53	3.571±1.625	0.440	>0.05
Psychological health practices	7	2.85 ± 0.948	2.857±1.049	0.032	>0.05
Physical health and activity health practices	7	2.975±1.049	2.714±1.132	1.08	>0.05
Treatment and follow up practices	10	2.725±1.085	2.404±1.127	1.31	>0.05
Hygienic health practices	10	2.500±1.176	2.166±1.228	1.25	>0.05
Total self -care practices	42	14.77± 3.05	13.714 ± 3.846	1.38	>0.05

The test used independent t test. No statistical significant difference (p >0.05)

Table (5) Distribution of self-care practices mean scores of the studied sample regarding cervical cerclage after implementing the educational intervention (n=82)

Practice items	Score	Study group N=42	Control group N=40	Independent t test	P value
		Mean ±SD	Mean ±SD		
Nutritional health practices	8	6.23 ± 1.75	4.92 ± 1.40	-3.974	.000**
Psychological health practices	7	4.78 ± 1.81	2.54 ± 1.15	-7.089	.000**
Physical health and activity health practices	7	4.85± 2.35	2.14 ± 1.27	-6.563	.000**
Treatment and follow up practices	10	6.38 ± 3.13	3.02 ± 1.82	-6.644	.000**
Hygienic health practices	10	5.80 ± 3.61	3.02 ± 1.40	-4.580	.000**
Total self -care practices	42	28.07 ± 10.51	15.66 ± 3.10	-7.558	.000**

The test used independent t test . **A highly statistical significant difference (p ≤ 0.001)

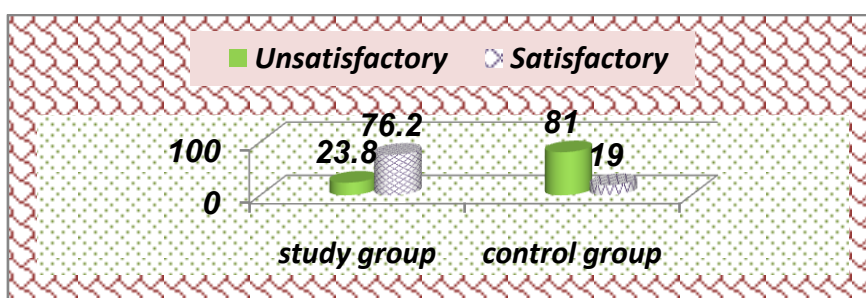


Figure 2: Distribution of the studied sample according to total self-care practices scores after implementing the educational intervention (n=82).

Table(6) Relation between total knowledge score of studied sample and their socio-demographic data.

Socio-demographic data.	Study group				Control group			
	Mean ±SD	Statistical test		P value	Mean ±SD	Statistical test		P value
		F test	Indepen-dent t test			F test	Indepen-dent t test	
Age in years								
20-25	27.84± 3.95	0.637		>0.05	13.61± 3.94	0.644		>0.05
26-30	27.14± 3.43				13.42± 4.25			
31-36	26.40 ± 2.74				14.93 ± 3.47			
Educational level								
Preparatory	25.83± 3.04	14.68		<0.001**	14.08 ± 3.87	3.66		<0.05*
Secondary	27.00 ± 0.85				11.50 ± 1.83			
University	24.12±3.09				14.75 ± 5.14			
Post graduate	31.10 ± 1.96				16.40 ± 3.09			
Residence								
Urban	26.95± 3.67		2.16	<0.001**	15.18 ± 4.31		0.212	<0.05*
Rural	27.25± 3.05				12.75 ± 2.88			
Occupation								
Employment	27.66 ± 2.52		0.914	>0.05	14.93± 4.25		1.08	>0.05
House wife	26.77± 3.74				13.51± 3.60			

The test used independent t test and F test. **A highly statistical significant difference (p ≤ 0.001) * Statistical significant difference (p ≤ 0.05)

Table (7) Relation between total self-care practices score of studied sample and their socio-demographic data.

Socio-demographic data.	Study group				Control group			
	Mean ±SD	Statistical test		P value	Mean ±SD	Statistical test		P value
		F test	Independent t test			F test	Independent t test	
Age in years								
20-25	21.69±11.27	4.88		<0.001**	15.38 ±3.61	0.105		>0.05
26-30	28.64 ±11.11				15.64 ± 2.34			
31-36	33.06 ± 5.94				15.93± 3.43			
Educational level								
Preparatory	24.41 ±14.31	4.85		<0.05*	15.08 ±3.60	0.353		<0.05*
Secondary	34.08 ± 3.28				15.41 ± 3.11			
Graduate	20.00 ± 9.19				16.37 ± 3.46			
Post graduate	31.70 ± 6.00				16.10 ± 2.37			
Residence								
Urban	27.72 ± 11.49		0.222	>0.05	15.54 ± 3.54		0.266	>0.05
Rural	28.45 ± 9.61				15.80 ± 2.62			
Occupation								
Employment	27.33 ±10.32		0.340	>0.05	16.00 ± 1.96		0.603	>0.05
House wife	28.48±10.79				15.48 ± 3.60			

The test used independent T test and F test between the study and control group.

**A highly statistical significant difference (p ≤ 0.001) * Statistical significant difference (p ≤ 0.05*)

Table (8) Correlation coefficient between total knowledge score and total self-care practices scores in study group before/after implementing the educational intervention.

Variables	Practices pre-intervention		Practices post-intervention	
	R	P value	R	P value
Knowledge pre-intervention	0.262	< 0.05	-	-
Knowledge post-intervention	-	-	0.492	0.000**

Table (9) Distribution of the studied sample according to maternal outcomes (n=82).

Maternal outcomes	Study group N=42		Control group N=40		χ ²	P value
	No	%	No	%		
Genital tract infection						
Yes	6	14.3	22	55.0	10.66	<0.001**
No	36	85.7	18	45.0		
Miscarriage>14 and <28 weeks						
Yes	3	7.1	9	22.5	3.86	<0.05*
No	39	92.9	31	77.5		
Premature rupture of membrane						
Yes	4	9.5	13	32.5	6.58	<0.05*
No	38	90.5	27	67.5		
Preterm labor >14 and <37 weeks						
Yes	3	7.1	10	25.0	4.89	<0.05*
No	39	92.9	30	75.0		
Unplanned removal of cerclage						
Yes	4	9.5	14	35.0	7.76	<0.05*
No	38	90.5	26	65.0		
Vaginal bleeding						
Yes	6	14.3	17	42.5	8.08	<0.05*
No	36	85.7	23	57.5		
Cervical laceration						
Yes	5	11.9	18	45.0	11.11	<0.001**
No	37	88.1	22	55.0		

χ²: Chi-Square test, **A highly statistical significant difference (p ≤ 0.001), * Statistical significant difference (p ≤ 0.05*)

Table (10) Distribution of the studied sample according to neonatal outcomes (n=82).

Neonatal outcomes	Study group N=42		Control group N=40		χ^2	P value
	No	%	No	%		
Intrauterine fetal death						
Yes	1	2.4	5	12.5	3.09	>0.05
No	41	97.6	35	87.5		
Admission to neonatal intensive care unit						
Yes	3	7.1	10	25.0	4.89	<0.05*
No	39	92.9	30	75.0		

χ^2 : Chi-Square test, * Statistical significant difference ($p \leq 0.05^*$) No statistical significant difference ($p > 0.05$).

IV. Discussion

Cervical cerclage is a well-known surgical procedure carried out during pregnancy. It involves positioning of a suture (stitch) around the neck of the cervix, aiming to give mechanical support to the cervix and thereby reduce risk of preterm birth. The effectiveness and safety of this procedure remains controversial [6]. This study was carried out to evaluate the effect of an educational intervention on maternal and neonatal outcomes among pregnant women undergoing cervical cerclage. This aim was significantly achieved through the present study findings within the frame of previously mentioned research hypothesis which was women who receive an educational intervention would expected to improve their knowledge, self-care practices regarding postoperative cervical cerclage and would have better maternal and neonatal outcomes than those who don't.

Regarding socio-demographic data of the studied sample, the results of present study showed that, less than half of the study and control groups were in age group 26-30 years with a mean age of (27.59±7.84 & 26.49±6.54) years respectively, more than half of study group with secondary education compared with more than one third in control group. More than half of both group live in rural area and were house wife with no significance differences between both groups. This indicated that both groups were homogenous before conduction of the study. This results are in agreement with Abd Elaal et al. [19] who carried out a study on vaginal progesterone and cervical cerclage for preterm labor prevention and their impact on prenatal outcome which found that the mean age of the studied groups was (27.17±3.84, 27.63±3.63 & 27.88±3.91) years, with no significance differences between groups.

Moreover, these findings was in the same line with Mohamed,[20] who study self-care practices among pregnant women undergoing post-operative cervical cerclage and found that the mean age of the studied participant was (28.02±2.11) years, with more than two third were from rural area, slightly less than two third were secondary education and most of the study subject not employed. Inconsistent with these results, the study conducted on cervical cerclage in Nigerian tertiary hospital by Abieyuwa et al. [21] who reflected that the mean age of participants was (33.3±3.9) years. Such differences may be due to differences in the study population.

On investigating knowledge of the studied sample regarding cervical cerclage, the results of present study revealed that, there was no statistically significant differences between both study and control groups before implementation of the educational intervention regarding knowledge about definition, indication, type, timing of cerclage, complications and warning signs of cervical cerclage that may occur after surgery which most of both groups had inadequate knowledge. This may be due to defect of health care provider who give women incomplete information about cervical cerclage, also they not tell the women detailed information about contraindication of operation or inform them regarding complications and warning signs of cervical cerclage. This reflect diminished role of health care provider as health educators. Meanwhile, there was increasing in the mean scores of all items related to cervical cerclage knowledge with highly statistically significant differences after implementation the educational intervention was observed between two groups. This result is in agreement with Mohamed, [20] who reported that the total knowledge score of studied sample

regarding cerclage and self-care were incorrect knowledge before giving any education while had correct knowledge after giving education.

Concerning total self-care practices score of studied samples regarding cervical cerclage the findings of current study revealed that, there was no statistically significant differences between both study and control groups before implementation the educational intervention regarding nutritional health practices, psychological health practices, physical health and activity health practices, treatment and follow up practices and hygienic health practices. This may be due to lack of post operative health instruction regarding self-care which must be given by health care provider. Meanwhile, more than three quarter of study group have satisfactory of all items of self-care practices after implementing the educational intervention. While the majority of control group have unsatisfactory self-care practices with highly statistically significant differences observed between two groups. These findings are supported by Mohamed, [20] who reported that more than one half of studied sample had unsatisfactory self-care practice before given any education compared post education. Also, in agreement with Bower et al.[12] who emphasized that factors which affecting delivery of self-care support by professional, contextual influences may be an important driver of patient behavior. So that intervention to change patient behavior need to take in account of relevant social, financial and environmental barriers such as poverty, employment and impact of the health services encouraging or discouraging self-care.

As regards relation between the studied sample total knowledge score and their socio-demographic data. The findings of present study showed that there was no statistically significant differences between both study and control groups regarding total knowledge score about cervical cerclage and their age and occupation. Meanwhile, there was highly statistical significant differences between both groups regarding total knowledge score and level of education and residence ($p < 0.001^{**}$). This result is in accordance with study conducted by El-Sherbeny [22] who study self-care of women during postpartum period and found that the women lived in urban area with educational background had correct knowledge than women lived in rural area with limited educational background.

Concerning relation between studied sample total self-care practices score about cervical cerclage and their socio-demographic data, the findings of current study showed that, there was highly statistical significant differences between both study and control groups regarding total self-care practices score and their age ($P < 0.001^{**}$) and statistically significant differences between both groups regarding total self-care practices and level of education. Meanwhile, there was no statistically significant differences between both groups regarding total self-care practices score and residence and occupation ($P > 0.05$). This finding in congruence with El-Sherbeny, [22] who revealed that women with highly educational level had better self-care practices related to postpartum period than others. On the other hand, this results disagreed with Mohamed, [20] who revealed that there was a statistical significant differences between women self-care practices regarding postoperative cervical cerclage and their age ($p < 0.05$) while, there was a highly statistical significant differences between women self-care practices regarding postoperative cervical cerclage and their educational level ($p < 0.001^{**}$).

Regarding correlation between the studied sample total knowledge score and total self-care practices score before & after implementing the educational intervention. the findings of current study revealed that there was a positive association between studied sample total knowledge and total self-care practices score before implementing the educational intervention. Additionally, there was a highly statistical significant association between total knowledge score and total self-care practices score after implementing the educational intervention. These findings are in agreement with Mohamed, [20] who found that more than half of women who had satisfactory self-care have incorrect knowledge regarding cerclage and self-care with highly statistical significant association between knowledge and self-care practices among the studied sample. Also, in accordance with Acosta et al. [23] who revealed that increasing knowledge on popular practices contributes to a health education process, which permits the encouragement of a healthy practices and the discouragement of inadequate practices.

As regards maternal outcomes, the findings of the present study showed that, nearly one third of control group had premature rupture of membrane, about one quarter had preterm labor more than one third had unplanned removal of cerclage and less one half had vaginal bleeding and less than one quarter had miscarriage compared to low percentage of all items in the study group with statistically significant differences between both groups ($P < 0.05^*$). Meanwhile, there was a highly statistical significant differences between both groups regarding genital tract infection and cervical laceration ($P < 0.001^{**}$). These finding are in agreement with Mohamed, [20] who found that more than two third of studied sample were had genital tract infection, while one tens of them had premature rupture of membrane and minority of them had vaginal bleeding. In addition, these findings was partially agreement with Osemwenkha, [24] who reported that the frequency of premature rupture of membrane after cerclage 30%, whereas 15.5% of patients developed premature contractions, also one (2.43%) of the patient in the study developed cervical laceration due to contraction. Also these findings were partially on contrary with Wang et al. [25] in their study about role of cervical cerclage and vaginal progesterone in the treatment of cervical incompetence with/without preterm birth history, and found that the rate of preterm labor (<37weeks) in both groups (44.1% and 39.1%, respectively) with no significant differences between both groups.

As regards neonatal outcomes the findings of the present study revealed that there was no statistical significant differences between study and control groups regarding intrauterine fetal death. Meanwhile, there was statistical significant differences between both groups regarding admission to neonatal intensive care unit. These findings were in agreement with Mohamed,[20] who found that the neonatal intensive care unit admission was 27.7%. Also these findings partially on contrary with Wang et al.[25] who found that there were no significant differences in the neonatal outcomes between the cervical cerclage and vaginal progesterone groups including the median birth weight (2750 g vs. 2810 g, $P = 0.145$), perinatal mortality (5.9% vs. 6.5%, $P = 0.908$), and 1-min Apgar scores (8.8% vs. 8.7%, $P = 0.984$).

V. Conclusion

Based on the overall findings of the present study, it can be concluded that the results of the present study support its hypothesis that is to say that the educational intervention positively affect women's knowledge, self-care practices regarding cervical cerclage and had better maternal and fetal outcomes with significant differences between both groups. There was a highly statistical significant association between total knowledge and total self-care practices score after implementing the educational intervention.

IV. Recommendation

In the light of the findings of current study the following recommendations were be suggested:

1. The educational intervention should be used as one of the routine hospital care for women undergoing cervical cerclage.
2. In-service training program for maternity nurses about postoperative self-care management for pregnant women undergoing cervical cerclage.
3. Replication of the present study on larger sample in different hospitals for generalizing the findings.
4. Further study is required to address care of cervical cerclage.

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Conflicts of Interest Disclosure

The authors declare that there is little national and international research studied this topic.

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