

Self-Care Practices and Pregnancy Outcomes among Women undergoing Cervical Cerclage

Lamiaa Mahmoud Mahmoud ^{1,2}, Manal Abdalla Gaheen ³, Hala Abd El-FattahAli ⁴,
Shimaa Mohamed Hashem ⁵

¹Master student of Maternal and Neonatal Health Nursing, Faculty of Nursing, Tanta University, Egypt.

²Demonstrator at Women Health and Midwifery Nursing, Faculty of Nursing, Kafr El-Sheikh University, Egypt.

³Professor of Maternal and Neonatal Health Nursing, Faculty of Nursing, Tanta University, Egypt.

⁴Professor of Women Health and Midwifery Nursing, Faculty of Nursing, Kafr El-Sheikh University, Egypt.

⁵Lecture of Maternal and Neonatal Health Nursing, Faculty of Nursing, Tanta University, Egypt.

Corresponding author: lamiaa_saqr@nur.kfs.edu.eg

Abstract

Background: Cervical insufficiency is a well-recognized cause of recurrent second trimester pregnancy loss and preterm birth. **Aim:** The aim of this study was to assess self-care practices and pregnancy outcomes among women undergoing cervical cerclage. **Subjects and method:** Descriptive research design was used to conduct this study. This study was carried out in Egypt at the out-patient and inpatient obstetrical and gynecological departments of: Tanta and Kafr El-Sheikh University Hospitals, El-Menshaway General Hospital at Tanta city and Kafr El-Sheikh General Hospital. Stratified proportional sample of 150 pregnant women was included in the study. **Three tools** were used for data collection: **Tool (I):** Pregnant women's knowledge regarding cervical cerclage assessment sheet. It included **Part one:** Socio-demographic data of the pregnant women, **Part two:** Obstetric history of the pregnant women and **Part three:** Assessment of pregnant women's knowledge regarding cervical cerclage **Tool (II):** Pregnant women's self-care practices regarding cervical cerclage **Tool (III):** Pregnancy outcomes assessment tool. It included **Part one:** Maternal outcome and **Part two:** Neonatal outcome. **Results:** The current study revealed that 58% of the studied pregnant women had low level of Knowle regarding cervical cerclage with 79.3% of them had unsatisfactory practice level. Additionally, there was a statistically positive correlation between women's total score level of knowledge and their total score level of practice regarding cervical cerclage **Conclusion:** The studied nurses had poor level of knowledge and unsatisfactory practice regarding cervical cerclage. **Recommendations:** Developing antenatal classes for all pregnant women especially those at risk to increase their knowledge and enhance their practices regarding cervical cerclage.

Keywords: Practice, Knowledge, Cervical cerclage, Pregnancy outcomes.

Introduction

Cervical insufficiency (CI) is a significant obstetrical problem, defined as cervical dilatation without pain when uterine contractions are not present. This indicates that the cervix is fragile and cannot remain closed till the birthdate. It affects 1% of the obstetric population worldwide and 8% of women with repeated mid-trimester abortion. (Wei & Wang, 2023)

Risk factors for CI can be categorized into congenital and acquired factors, Congenital factors include utero diethylstilbestrol exposure, collagen vascular disease or Müllerian tube abnormalities. While, acquired factors including cervical trauma, dilatation and curettage, induced abortion, previous cervical laceration, loop electrosurgical excision procedure (LEEP), cold-knife cone biopsy, or other cervical surgeries. (Han et al., 2020)

Cervical insufficiency is a well-known reason for both repeated mid-trimester abortion and premature birth which is one of the main causes of neonatal and perinatal morbidity and mortality globally. Therefore, effective management of CI is vital. (van Dijk et al., 2020)

Cervical cerclage (CC), implantation of a suture that strengthens the uterine cervix is the sole effective treatment of CI. It seeks to preserve the structural integrity of the cervix to extend gestation and enhance obstetrical outcomes. Traditionally, a cerclage is placed vaginally using the Shirodkar or McDonald technique. Nonetheless, a cerclage may instead be inserted abdominally in more severe cases where a vaginal cerclage has failed or the cervix is very short. Transvaginal cerclages fall into three categories, history-indicated, ultrasound-indicated, and emergency (physical examination)-indicated cerclage. (Basbug et al., 2020)

History-indicated cerclage is often carried out electively at early gestation based on the

previous history of mid-trimester abortion. Alternatively, ultrasound-indicated cerclage offered to women with a cervical length less than 25 mm on ultrasound. Furthermore, physical examination-indicated cerclage is inserted when the pregnant woman presents with the membranes protruding into the vagina but no signs of labor, genital infection or significant vaginal bleeding. (Chen & Shi, 2023)

The maternity nurses play a crucial role in caring for women undergoing cervical cerclage; before the operation they must conduct a thorough history, provide in detail explanation of the operation for the woman and also provide necessary specific instructions for adequate preparation. While during the operation, nurses can reassure the woman, ensure aseptic technique, proper positioning and draping of women, also close monitoring of women and fetus wellbeing throughout the procedure, then after the operation; the nurse must discuss self-care practices, warning signs as well as, follow up or consultation needed. (Pang et al., 2021)

Significance of the study

Preterm birth causes significant neonatal morbidity and mortality, as well as long-term disability. Moreover, Recurrent pregnancy loss (RPL) can be devastating to families involved, both physically and emotionally. Cervical cerclage is the procedure of choice to prevent second trimester pregnancy loss and preterm labor caused by cervical insufficiency. (Ticconi et al., 2020) Therefore, in order to understand the effectiveness of cervical cerclage on maternal and neonatal outcomes, the researcher found that it is important to conduct this study to assess self-care practices and pregnancy outcomes among women undergoing cervical cerclage.

The aim of this study was to

Assess self-care practices and pregnancy outcomes among women undergoing cervical cerclage.

Research question

What are the self-care practices and pregnancy outcomes among women undergoing cervical cerclage?

Subjects and method:

Study Design

A descriptive study design was used.

Setting

The study was carried out in Egypt at the out-patient and inpatient obstetrical and gynecological departments of: Tanta University Hospitals, Kafr El-Sheikh University Hospital, El-Menshawey General Hospital at Tanta city and Kafr El-Sheikh General Hospital.

Subjects: A stratified proportional sample of 150 pregnant women was selected according to the number of women's attending to each setting and fulfilling the inclusion criteria:

- Age 18-35 years.
- Gestational age \geq 12 week
- Singleton pregnancy.
- Free from other medical and obstetrical disorders in the current pregnancy

Tools of data collection: To achieve the study aim, the following three tools were used for data collection.

Tool (I): Pregnant women's knowledge regarding cervical cerclage assessment sheet

It was developed by the researcher after reviewing recent related literatures. **Othman & Alzahrani, (2019), Mohamed et al., (2018) & Oriji et al., (2021)**

It comprised three parts as follows:-

Part (1): Socio-demographic data of the pregnant women:

This part was used to collect basic data about pregnant women's general characteristics included; age in years, age at marriage, marital status, years of marriage, level of education, occupation, height, weight, body mass index, husband's education, husband's occupation, residence, number of

family member, type of family, family income and phone number.

Part (2): Obstetric history of the pregnant women:

This part included obstetric characteristics of the pregnant women as follow; gravidity, parity, gestational age, mode of previous delivery, history of still birth, history of losing children as well as the presence of obstetrical complications in previous pregnancies, deliveries and puerperium. In addition, past history of cervical cerclage, time of the first antenatal visit during current pregnancy, sequence of the antenatal follow up visits also, the place of antenatal care and attendance of antenatal care classes.

Part (3): Assessment of pregnant women's knowledge regarding cervical cerclage:

It was used to assess knowledge of pregnant women about cervical cerclage. It included definition, types, timing, indication, complications of cervical cerclage, warning signs after cerclage, as well as sources of their knowledge.

The scoring system of tool I: part (3) was as follows

- Correct and complete answer was given a score of (2).
- Correct and incomplete answers were given a score of (1).
- Incorrect answer and don't know was given a score of (0).

The total score of knowledge was calculated and converted into percent score as follows

- High level of knowledge \geq 75% of the total score.
- Moderate level of knowledge 50 - < 75% of the total score.
- Low level of knowledge < 50% of the total score.

Tool (II): Pregnant women's self-care practices regarding cervical cerclage:

It was developed by the researcher after reviewing the recent related literatures. **Othman & Alzahrani, (2019) &**

Mohamed et al., (2018) It was used to assess woman's self-care practices regarding cervical cerclage as: physical, nutritional, psychological and hygienic health practices. Physical practices such as (get enough rest and sleep after the operation, put limitations in housekeeping activities for the rest of pregnancy). Nutritional practices such as (get healthy balanced diet, consume high fiber foods like fruits and vegetables). Psychological practices such as (practice relaxation and coping techniques, ask for help from others) and hygienic practices such as (perform perineal self-care, avoid vaginal douches, take some time before initiating sexual intercourse after the operation).

Scoring system of pregnant woman's self-care practices was as following

- Done, it was scored as "one"
- Not done, it was scored as "zero".

The score of each item of self-care practices was summed up and converted into percent score as follows: -

- Satisfactory practice: $\geq 75\%$
- Unsatisfactory practice: ($< 75\%$)

Tool (III): Pregnancy outcomes assessment tool

It was developed by the researcher after reviewing the recent related literatures. **Othman & Alzahrani, (2019), Mohamed et al., (2018), Shuaibu et al., (2021) & El-Gilany et al., (2020)** It comprised two parts as follows:

Part (1): Maternal outcomes: It was used to assess maternal outcomes that included; miscarriage, gestational age at delivery, mode of delivery, preterm labor, genital tract infection, premature rupture of membrane, unplanned removal of cerclage, vaginal bleeding and cervical laceration.

Part (2): Neonatal outcomes: This part was used to assess neonatal outcomes that included; chorioamnionitis, intrauterine fetal death, prematurity and admission to neonatal intensive care unit.

Method

The study was implemented according to the following steps: -

Administrative approval: an official letter clarifying the purpose of the study was obtained from the Faculty of Nursing and submitted to the responsible authorities of the selected study settings to obtain their approval and cooperation to carry out this study.

Ethical and legal considerations were considered all over the study as the following

- Approval of the Scientific Research Ethical Committee was obtained. (Code 190/1/2023).
- All participants were informed about the aim of the study. An informed consent was taken from every participant in the study including the right to withdraw at any time. The researcher ensured that the nature of the study didn't cause any harm or pain for the entire sample. Privacy and confidentiality of the collected data were taken into consideration.

Tools' development: Tools were developed by the researcher after reviewing the recent related literature.

Validity and reliability: Tools were tested for construct and content validity by jury of 5 experts in the field of maternal and neonatal health nursing, corrections and modifications were done accordingly.

- The reliability of the study tools was tested by using Cronbach's Alpha test. They were (0,895, 0,877, and 0,865) respectively for knowledge, self-care practices and Pregnancy outcomes among women undergoing cervical cerclage.

- **A pilot study** was conducted on 10% of the total sample (15 pregnant women) to test the clarity and applicability of the developed tools and to determine any obstacles that may be interfere with the process of data collection.

- The result of the pilot study revealed that the statements were clear and relevant. So, sample of pilot study were included in the study.

Field of work

- Data collection was conducted in a period of six months ranged from the beginning of June 2023 to the end of November 2023.
- The researcher attended at the previously mentioned settings at the morning shift from 9.00 A.M. to 1 P.M four days/week as follows (two days from kafr El-sheikh general hospital and kafr El-sheikh university hospital and two days a week from EL-Menshawey General Hospital and Tanta University Hospital) until the predetermined sample size obtained.
- The researcher introduced herself to every woman then, informed consent was taken.
- The data was collected individually through face to face structured interview with each woman undergoing cervical cerclage at the beginning of the second trimester of pregnancy, according the previously mentioned inclusion criteria and settings.
- Data collected through using the study tools: **Tool I, part one and part two** to assess woman's sociodemographic characteristics and obstetric profile respectively, as well as **part three** was used to assess woman's knowledge regarding cervical cerclage. **Tool II** was used to assess woman's self-care practices.
- Pregnancy outcomes among women undergoing cervical cerclage, were assessed by the researcher using tool (III) via follow up telephone calls weekly throughout the pregnancy and during the first week of postpartum period.

Statistical analysis

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social

Sciences, version 21, SPSS Inc. Chicago, IL, USA).

For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (X^2) and linear correlation coefficient (r), and matrix correlation to detect the relation between the variables (P value).

Results

Table (1): represents Socio-demographic characteristics of the studied pregnant women. It shows that approximately two fifths (40.7%) of the studied pregnant women aged from 25 to less than 30 years old with mean age of $21.89 \pm .836$ years. The table also revealed that the majority of them (86%) aged from 18 to less than 25 years at marriage with mean of $22.14 \pm .373$ years, and less than three fifths (58%) of them were married since less than one year. Concerning the studied pregnant women place of residence, it was noted that more than half of them (52.7%) were from rural region. Regarding the women's and husband's educational level, it was reported that (45.3% and 27.3% respectively) of them had higher education. It was also observed that more than three fifths (65.3%) of the studied pregnant women were housewives. As regard to BMI, slightly less than two fifths of the studied pregnant women (38.7%) were within normal. Moreover, the table also demonstrates that according to the studied pregnant women's view more than three fifths (63.3%) of them had enough income.

Table (2): Shows Obstetrical history of the studied pregnant women. It is noticed that more than one quarter of them (28%) were nullipara. Also, it was showed that more than three quarters (76%) of the studied pregnant women had history of abortion. The table also illustrated that more than two fifths

(44.8%) of the studied pregnant women had experienced preterm labor during previous pregnancy.

Relating the gestational age at insertion of cervical cerclage, it was noted that more two thirds (70.7%) of the studied pregnant women had cervical cerclage insertion at $12w < 18w$ of gestation and more than half (52%) of them had past history of cervical cerclage. Additionally, slightly less than two thirds (66%) of the studied pregnant women sought initial antenatal care (ANC) visit at the second trimester and more than half (53.3%) of them received their ANC at private clinic.

Figure (1): Shows total score of the studied pregnant women's knowledge regarding cervical cerclage. The figure reveals that nearly three fifths (58%) of the studied pregnant women had low level of knowledge regarding cervical cerclage compared to only (29% and 13% respectively) of them who had moderate and high level of knowledge regarding cervical cerclage.

Figure (2): present the sources of the studied pregnant women's knowledge regarding cervical cerclage The figure Reveals that nearly half (46.9%) of the women mentioned that doctors were the primary source of knowledge regarding cervical cerclage, , followed by internet, relatives and friends which were recalled by (30.4%, 23.1%, 17.8% respectively) among the studied pregnant women.

Figure (3): Clarifies total score levels of the studied pregnant women regarding their self-care practices. It shows that slightly less than four fifths (79.3%) of the studied pregnant women had unsatisfactory total score level of practice regarding cervical cerclage, while nearly one fifth (20.7%) of them had satisfactory total score level of practice regarding cervical cerclage.

Table (3): Represents maternal outcomes of the studied pregnant women undergoing cervical cerclage. It Clarifies that less than

three fifths (56.7%) of the studied pregnant women had gestational age of ≥ 37 wks. at delivery, with the majority (91.5%) of them delivered by cesarean section. Also, more than four fifths (80.7%, 86% respectively) of them had no genital tract infection nor miscarriage. As well as nearly three fifths (56.7%) of them had term birth.

The table also presented that the majority of the studied pregnant women had no vaginal bleeding, cervical laceration, unplanned removal of cerclage or premature rupture of membrane, which were reported by (87.3%, 90.7%, 92% and 91.3%), respectively. **Table (4):** Represents neonatal outcomes of the studied pregnant women undergoing cervical cerclage. It Illustrates that the majority (92.7%, 88%, 86% respectively) of the fetuses and neonates had no chorioamnionitis, intrauterine fetal death or prematurity. Slightly less than two thirds (66%) of them didn't admit to neonatal intensive care unit. As regard to birth weight, it was showed that more than three fifths (61.3%) of the neonates had low birth weight ranged between 1 kg < 2.5 kg.

Table (5): Shows Correlation between total score level of knowledge and total score level of practice among women undergoing cervical cerclage. The table demonstrates that there was a significant positive correlation between the women's total score level of knowledge and their total score level of practice regarding cervical cerclage where $r=0.825$ and $P=0.001^{**}$.

Table (1): Sociodemographic characteristics of the studied pregnant women (n=150).

Socio-demographic characteristics	The studied pregnant women (n=150)	
	N	%
Age/year		
18<25 years	44	29.3
25<30 years	61	40.7
30<35 years	45	30.0
Range	18- 35	
Mean ± SD	21.89 ± 0.836	
Marital status		
Married	128	85.3
Divorced	13	8.7
Widow	9	6.0
Residence		
Rural	79	52.7
Urban	71	47.3
Education level		
Illiterate	4	2.7
Read and write	4	2.7
Primary or preparatory school	26	17.3
Secondary school /diploma	68	45.3
University/postgraduate	48	32.0
Occupation		
Housewife	98	65.3
Working	52	34.7
BMI		
Normal (18.5-24.9 Kg/m ²)	58	38.7
Overweight (25-29.9 Kg/m ²)	55	36.7
Obese (≥30 Kg/m ²)	37	24.7
Family income		
Enough	95	63.3
Not enough	55	36.7

Table (2): Obstetrical history of the studied pregnant women (n=150).

Obstetrical history	The studied pregnant women (n=150)	
	N	%
No. of Para		
Nulliparous	42	28.0
Once	54	36.0
Twice	24	16.0
Three times or more	30	20.0
History of abortion		
Yes	114	76.0
No	36	24.0
Complications during previous pregnancy, delivery and puerperium		
Yes	76	50.7
No	74	49.3
If yes, what are these complications	(n=76)	
Preeclampsia		
Gestational diabetes	3	3.9
Immature Rupture of Membrane(PROM)	2	2.6
Antepartum hemorrhage	4	5.3
Postpartum hemorrhage	4	5.3
Preterm labor	3	3.9
Post term labor	34	44.8
Stillbirth	4	5.3
Low Birth Weight (LBW)	3	3.9
	19	25
Past history of cervical cerclage		
Yes	78	52.0
No	72	48.0
Gestational age at insertion of cervical cerclage		
12w<18w	106	70.7
18w<24w	44	29.3
Range		
Mean ± SD	12-23 22.23 ± 10.23	

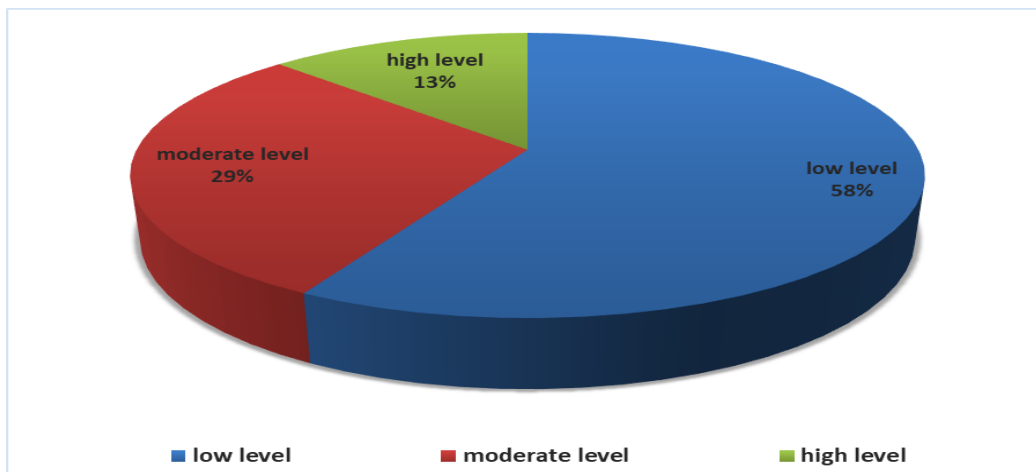


Figure (1): Total score of the studied pregnant women’s knowledge regarding cervical cerclage (n=150).

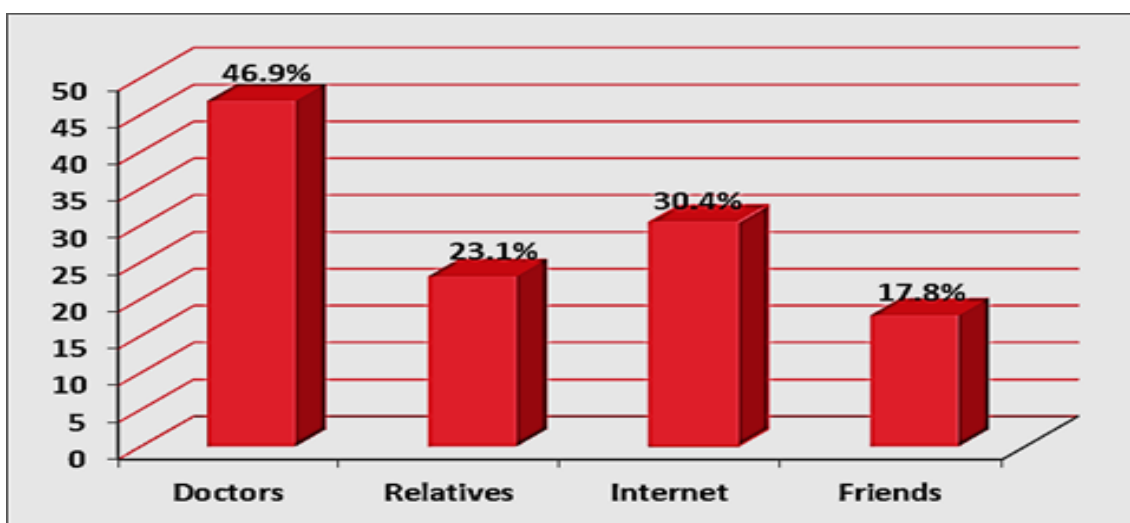


Figure (2): Sources of the studied pregnant women's knowledge regarding cervical cerclage (n=150).

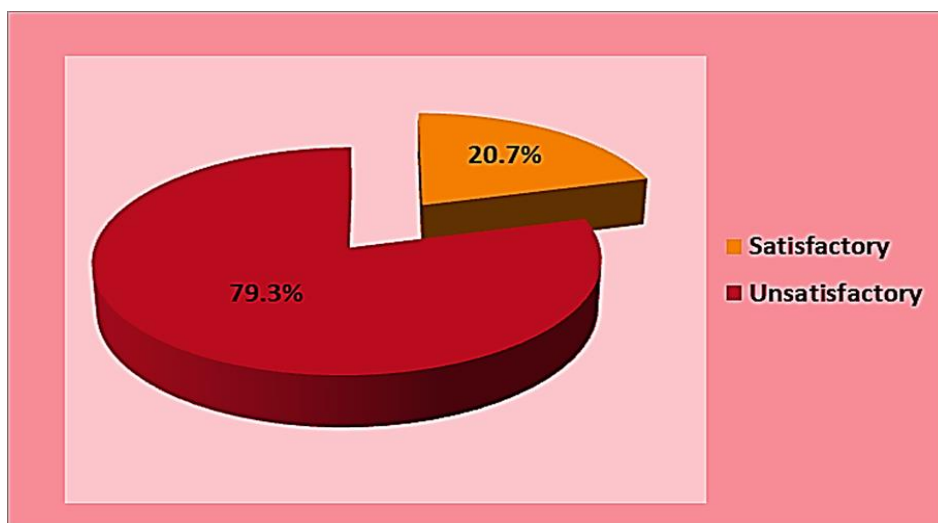


Figure (3): Total score levels of the studied pregnant women regarding their self-care practices (n=150).

Table (3): Maternal outcomes of the studied pregnant women undergoing cervical cerclage (n=150).

Maternal outcomes	The studied pregnant women (n=150)	
	N	%
Gestational age at delivery		
<28w	21	14.0
<37w	44	29.3
≥37w	85	56.7
Mode of delivery	(n=129)	
Normal vaginal delivery	11	8.5
Cesarean section	118	91.5
Genital tract infection		
Yes	29	19.3
No	121	80.7
Miscarriage		
Yes	21	14
No	134	86
Preterm labor		
Yes	44	29.3
No	106	70.7
Term birth		
Yes	85	56.7
No	65	43.3
Vaginal bleeding		
Yes	19	12.7
No	131	87.3
Cervical laceration		
Yes	14	9.3
No	136	90.7
Unplanned removal of cerclage		
Yes	12	8.0
No	138	92.0
Premature rupture of membrane		
Yes	13	8.7
No	137	91.3

Table (4): Neonatal outcomes of the studied pregnant women undergoing cervical cerclage (n=150).

Fetal and neonatal outcomes	The studied pregnant women (n=150)	
	N	%
Chorioamnionitis		
Yes	11	7.3
No	139	92.7
Intrauterine fetal death		
Yes	18	12.0
No	132	88.0
Prematurity		
Yes	21	14.0
No	129	86.0
Admission to neonatal intensive care unit		
Yes	51	34.0
No	99	66.0
Birth weight		
<1 Kg	25	16.7
1 Kg<2.5 Kg	92	61.3
≥2.5 Kg	33	22.0

Table (5): Correlation between total score level of knowledge and total score level of practice among women undergoing cervical cerclage (n=150).

Total knowledge score	Total practice score among the studied pregnant women (n=150)	
	R	P
	0.825	0.001**

Discussion

Cervical insufficiency (CI) is one of the most significant contributors to recurrent pregnancy loss and preterm birth and described as an inability of a cervix to maintain pregnancy in the absence of uterine activity, labor, or both in the second

trimester. At present, the most viable treatment for cervical insufficiency is cervical cerclage (CC). (Ikechebelu et al., 2023)

Appraisal of pregnant women's knowledge and improving self-care practices for cervical cerclage management can be

incentive and can enhance pregnancy outcomes. (Wei & Wang, 2023). Therefore, this study was conducted to assess self-care practices and pregnancy outcomes among women undergoing cervical cerclage.

Concerning the socio-demographic characteristics of the studied pregnant women, more than two-fifths of women age ranged from 25 to less than 30 years. This finding is in line with Abdallah et al., (2023) findings who studied effect of implementing educational program on pregnant women's maternal and neonatal outcomes regarding cervical cerclage. Also, Mohamed et al., (2018) who assessed effect of an educational intervention on maternal and neonatal outcomes among pregnant women undergoing cervical cerclage, implied that more than two-fifths of their study subjects were between 26-30 years old. On the other hand, Okusanya & Isabu, (2015) who assessed outcome of pregnancy with history-indicated cervical cerclage insertion in a low-resource setting reported that two-fifths of the women in their study were between 30-34 years old. In addition, John & Alegbeleye., (2023) a study at a university teaching hospital in southern Nigeria to assess practice of cervical cerclage mentioned that more than half of women in their study aged 32-36 years.

Regarding place of residence, slightly more than half of the studied pregnant women were from rural areas. This result is strongly in agreement with Mohamed et al., (2018). On the same line, Zeng et al., (2021) a study to assess pregnancy outcomes and factors affecting the clinical effects of emergency cerclage in twin pregnancies with cervical dilation and prolapsed membranes, reported that less than three-fifths of their study subjects were from rural areas. On contrast, Abdallah et al., (2023) stated that nearly three-fifths of

the women in their study were from urban areas.

In relation to the studied pregnant women's educational level, it was noticed that nearly half of the studied pregnant women had secondary school education. This finding matches with Ikechebelu et al., (2023) who studied comparison of pregnancy outcomes of history-indicated and ultrasound-indicated cervical cerclage: a retrospective cohort study. Also, in the same line with Mohamed et al., (2018) findings. On the other hand, Abdallah et al., (2023) who showed that less than than one-third of the women in their study had university education. From the researcher's point of view, this difference may be due to different study settings and also because more than half of the current study sample were from rural areas.

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Pertaining to the women's occupation, in the current study nearly two-thirds of the women were housewives. these findings are consistent with, Gomaa, et al., (2023) in a study in Mansoura university hospital to assess obstetric outcome of cervical cerclage among pregnant women, found that nearly two-thirds of their subjects were

housewives. Moreover, **Abdallah et al., (2023)** found that more than four fifths of the women in their study were housewives. Conversely, **John & Alegbeleye, (2023)** mentioned that the majority of the women in their study were worked. From the researcher's point of view, the result of the present study may be due to different inclusion criteria of the study subjects as more than half of the women in the current study have a moderate level of education and were from rural areas where lack of employment opportunities is present.

Concerning the studied pregnant women marital status, the current study revealed that more than four-fifths of the women were married. In the same line, **Lawal et al., (2023)** who assessed a retrospective analysis of cervical cerclage outcomes in a low-income country, in addition to, **Orijii et al., (2021)** a study in yenagoa, south-south, Nigeria to assess cervical insufficiency and perinatal outcome in a tertiary hospital revealed that the majority of the women in their studies were married. From the researcher's point of view this similarity may be due to the fact that only married couples would try different routes including cervical cerclage to preserve pregnancy and got full term healthy neonate.

Regarding the studied women's obstetrical history, the result of the present study clarified that more than one-third of women were primiparous, such result was agreed with **Okusanya & Isabu, (2015)** who assessed the outcome of pregnancy with history-indicated cervical cerclage insertion in a low-resource setting, noticed that more than one-quarter of the studied sample was para one. In addition, **Orijii et al., (2021)** found that nearly half of the women in their study were primiparous. On contrast, **Lawal et al., (2023)** mentioned that more than half of their study sample were nulliparous.

As regard the history of abortion, the finding of the present study demonstrated that more than three-quarters of the women had experienced previous abortion. This finding is in accordance with **Orijii et al., (2021)** who portrayed that more than two-thirds of women in their study had previous abortion. Also, **Bigelow et al., (2019)** who studied Cervical length, cervical dilation, and gestational age at cerclage placement and the risk of preterm birth in women undergoing ultrasound or exam indicated Shirodkar cerclage, indicated that nearly half of their study women had history of previous abortion. From the researcher point of view, this agreement is due to the fact that elective cerclage (history-indicated cerclage) is done based on a history of prior spontaneous second trimester pregnancy loss and hence high abortion rate.

As regard to the studied pregnant women previous history of preterm labor, more than two-fifths of them had history of previous PTB. This finding match with, **Kuruma et al., (2022)** a study to assess the incidences of complications associated with cervical cerclage by indication of the procedure, clarified that nearly one-quarter of the women in their study had history of previous PTB. Similar finding was found in a study conducted by **Gomaa, et al., (2023)**. This disagrees with studies done by **Zeng et al., (2021) & Türkyilmaz & Karaaslan, (2020)** who studied the effectiveness of rescue cervical cerclage: a retrospective observational study, revealed that the majority of pregnant women in their studies didn't have previous history of PTB.

Regarding the past history of cervical cerclage, nearly half of the studied pregnant women had previous cervical cerclage placement. This finding strongly agrees with **Kuruma et al., (2022)** findings. On contrary to this result, **John & Alegbeleye, (2023)** mentioned that more than three-fifths of women in their study didn't have

previous history of cerclage placement. This may be due to more than three-quarters of the current study subjects had previous history of abortion and more than two-fifths had previous history of PTB.

In the present study approximately two-thirds of the studied pregnant women had cervical cerclage insertion at 12-18 weeks gestation. This finding agreed with **Ara et al., (2020)** a study to assess benefits of cervical cerclage to improve pregnancy outcome in cervical incompetence, reported that three-fifths of women in their study had cervical cerclage insertion at 12-16 weeks gestation. In the same context, **John & Alegbeleye, (2023)** also pointed out that less than three-fifths of the studied pregnant women had CC insertion at 11-15 weeks gestation.

From the researcher's point of view, the finding of the current study may be attributed to the fact that most cerclages are inserted after the first trimester when it is expected that miscarriages from other causes would have occurred. In addition, better prognosis and improved pregnancy and neonatal outcomes were noticed in case of CC were planned on the basis of previous recurrent second trimester pregnancy loss between 12-18 weeks gestation.

Conversely, **Türkyılmaz & Karaaslan, (2020)** they pointed out that the majority of women in their study had CC insertion 18-24 weeks. Also, a study conducted by **Zeng et al., (2021)** found that more than two-thirds of their studied women had gestational age more than 22 weeks at cerclage insertion.

On investigating total score of knowledge of the studied pregnant women regarding cervical cerclage, the results of present study revealed that, less than three-fifths of them had low level of knowledge regarding cervical cerclage. This result is in agreement with a study done by **Abdallah et al., (2023)** They pointed out that more

than four-fifths of their studied women had poor knowledge level regarding cervical cerclage at the pre-intervention phase. Moreover, the present study finding is consistent with **Mohamed et al., (2018)** findings at the pre-intervention phase. in the same line **Mohamed & Hassan, (2019)** who studied educational program to enhance pregnant women's knowledge about dental care and periodontitis outcomes, founded that more than three-quarters of women in their study had low level of knowledge before implementing the educational session.

On the other hand, this finding not harmony with **Sharma et al., (2020)** who studied Knowledge and practices regarding management of minor ailments of pregnancy among antenatal mothers, founded that nearly three-fifths of antenatal mothers had fair knowledge.

From the researcher's point of view, it can be attributed to the fact that nearly half of the studied pregnant women had only secondary school education and were from rural areas in which the different sources of knowledge are limited and no antenatal classes are conducted in their places of residence. In addition, primary health care centers staff in rural areas lack the updating knowledge and had only nursing technical diploma in which the content was limited in their curriculum. This could result in providing women with insufficient information about cervical cerclage.

Concerning total score level of the studied pregnant women regarding their self-care practices, the current study revealed that nearly four fifths of the studied pregnant women had unsatisfactory total score level of practice regarding cervical cerclage. From the researcher's point of view, this can be the result of inadequate post-operative health instructions from the healthcare professional regarding self-care. Additionally, this could be because women

typically didn't receive an educational pamphlet with information on pregnancy in general and cervical cerclage self-care practices in particular where they can turn to it when needed and used as an ongoing reference. This finding coincided with the studies of **Abdallah et al., (2023) & Mohamed et al., (2018)** who mentioned that the majority of women in their studies had an unsatisfactory level of practice regarding cerclage procedure at the pre-intervention phase.

As regarding to maternal out comes, the current study revealed that more than half of the studied pregnant women had full term pregnancy. This result is matching with **Ara et al., (2020) & Lawal et al., (2023)** findings. In addition to, **QIN et al., (2024)** who studied effect of different surgical routes on pregnancy outcome of history indicated cervical cerclage. Additionally, **Shuaibu et al., (2021)** who assessed cervical cerclage for cervical incompetence: indication, complication and pregnancy outcome at Aminu kano teaching hospital, kano: a five-year review, mentioned that nearly three-quarters of women in their studies had full term pregnancy. From the researcher's point of view, the current study finding is due to that nearly three-quarters of women had planned CC (history indicated and ultrasound indicated CC) at 12-18 weeks which is associated with improved pregnancy outcomes and also, prolonged latency period from insertion to removal of cerclage.

On the other hand, a study conducted by **Zeng et al., (2021) & Huang et al., (2023)** who studied effectiveness and pregnancy outcomes of ultrasound-indicated and physical examination indicated cervical cerclage: a retrospective study from a single center, they mentioned that nearly three-quarters of their studies samples experienced preterm birth. From the

researcher's point of view this difference from the current study is attributed to that the sample included in their study presented with prolapsed membranes a known risk factor for poor perinatal outcomes and receive ECC. Also, it's typically obvious that one of the major concerns with ECC is that it may prolong pregnancy long enough only to result in extremely preterm birth. The shorter latent time with ECC can be explained by undiagnosed intra-amniotic infections.

Although cerclage is considered a relatively simple and safe surgical procedure, it is not without complications. The findings of the present study showed that, nearly one-quarter had PTB, less than one-fifth of the studied pregnant women had genital tract infection, unplanned removal of cerclage and premature rupture of membrane. this study finding was in line with **Mohamed et al., (2018) & Abdallah et al., (2023)** findings.

Regarding the mode of delivery, the majority of the studied pregnant women delivered by CS. This finding is similar to **Liu et al., (2023)** a study to assess combined fetal reduction and cervical cerclage in twin pregnancies complicated by cervical insufficiency: effects on perinatal outcomes. And **Ekici et al., (2022)** who assessed cervical cerclage in twin pregnancies: obstetric and neonatal outcomes. they noticed that nearly four-fifths of women in their studies delivered by CS.

From the researcher's point of view, this finding may stem from the fact that pregnancies were "medicalised" once a stitch was inserted, hence, an increased anxiety to hasten birth in an attempt to avoid adverse CC outcomes. Furthermore, Egypt has the highest CS delivery rates in the world, as well as among the Arab countries. Also, labor pain and the potential difficulties of a typical vaginal delivery are

also major concerns for many women, which drives up demand for cesarean sections.

Concerning the neonatal birth weight, the current study revealed that more than three-fifths of the studied pregnant women neonates had low birth weight ranged from 1 Kg to less than 2.5 kg. This matches **Huang et al., (2023)** findings. Moreover, **Liu et al., (2023)** mentioned that half of the neonates of women in their study had low birth weight. From the researcher's point of view, finding of the current study may be because pregnant women in developing countries mainly consume a diet predominantly plant-based, macronutrient imbalanced, and consisting of inadequate micronutrients and thus resulting in poor birth outcomes. Moreover, half of the studied pregnant women were from rural areas which are characterized by inadequate access to food sources and poor knowledge on the essence of good diet quality and quantity.

In relation to neonatal admission to intensive care unit (NICU), nearly two-thirds weren't admitted to the NICU. This finding is consistent with **Gomaa, et al., (2023)** findings who mentioned that nearly three-fifths of women's neonates in their study didn't admit to NICU. On contrast, **Türkyılmaz & Karaaslan, (2020)** reported that three-quarters of neonates admitted to NICU. From the researcher's point of view, the difference between the current study and the above-mentioned study may be due to difference in the indication of CC procedure, in which history-indicated and ultrasound-indicated cerclage are associated with prolongation of gestational period and ultimately improved neonatal outcomes. while a non-elective cerclage (ECC) prolong pregnancy beyond viability but a significant proportion of women undergoing ECC will deliver preterm and therefore NICU admission since

Gestational age is the main factor affecting the prognosis, morbidity and mortality of preterm infants.

Concerning Relationship between total score level of knowledge regarding cervical cerclage among the studied pregnant women and their sociodemographic data, a statistically significant relation was present between the studied pregnant women's total score level of knowledge and their level of education. This is matching with **Mohamed et al., (2018) & Samuel et al., (2021)** who studied assessment of pregnant women's knowledge and practice about risks of iodine intake deficiency during pregnancy. they mentioned that there was a highly statistically significant relation between total knowledge of pregnant women in their studies and their demographic characteristics related to educational level.

As regard to relationship between total score level of practice regarding cervical cerclage among the studied pregnant women and their socio-demographic characteristics, there was significant relationship between the studied pregnant women total score level of practice and their level of education. In the same line, **Mohamed et al., (2018) & Samuel et al., (2021)** found that there was a statistically significant relationship between total self-care practices of their study subjects and level of education.

From the researcher's point of view, this agreement might be due to educational level was one of the important predicting factors for self-care practice among antenatal mothers in which 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.

Finally, regarding correlation between total score level of knowledge and total score level of practice among women

undergoing cervical cerclage, there was a significant positive correlation between the women's total score level of knowledge and their total score level of practice regarding cervical cerclage. This result is in agreement with **Omran et al., (2020)** who assessed Self-Care of Women during Postpartum period in Rural Area. Also, in accordance with **Mohamed et al., (2018)**. Moreover, **Abdallah et al., (2023)** shows that there was a statistically significant correlation between total knowledge level and practice level among study group subjects.

Cervical insufficiency is a principal cause of preterm birth and recurrent second trimester pregnancy losses. Knowledge and self-care practices of pregnant women regarding cervical cerclage can positively influence CC pregnancy outcomes. It is obvious from the result of the current study that it supports our research question. So, assessment of knowledge and self-care practices regarding CC among all pregnant women undergoing cervical cerclage should be a pivotal part of antenatal care provided to these women.

Conclusion

Based on the findings of the present study, it can be concluded that: -

Poor level of knowledge as well as unsatisfactory level of practice regarding cervical cerclage was reported among the studied pregnant women undergoing cervical cerclage. Furthermore, a significant positive correlation was observed between the women's total score level of knowledge and their total score level of practice regarding cervical cerclage

Recommendations

- Provision of appropriate and accessible posters and booklets in Arabic language containing basic needed information regarding cervical cerclage in all public service centers providing care for pregnant women.

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