Effect of Applying Standardized Evidence-Based Practices among Risk Women for Preterm Labour on Birth Outcomes

Rehab Soliman Abd El Aliem[1], Mai Ahmed Hassan[2], & Hemat Mostafa Hassan[3]
[1] Assistant Professors of Obstetrics and Gynecological Nursing, Faculty of Nursing, Benha University, Egypt
[2] Lecturer of Obstetrics and Gynecological Nursing, Faculty of Nursing, Benha University, Egypt
[3] Assistant Professors of Obstetrics and Gynecological Nursing, Faculty of Nursing, Benha University, Egypt

Abstract:
Background: Preterm labor is a curable illness associated with a high risk of neonatal morbidity and mortality; the prevalence of preterm birth is rising globally which can be reduced by applying Evidence-based interventions. **Aim:** The study aimed to study the effect of applying standardized evidence-based practices among risk women for preterm labor on birthing outcomes. **Design:** Quasi-experimental study design (pre & post-test) was utilized. **Settings:** The study was carried out the obstetric emergency unit, obstetric out-patient clinic, and obstetric &gynecological department affiliated to Benha university hospital, Egypt. **Sample:** a purposive sample of 140 pregnant women at high risk for preterm labor. **Tools:** three tools were used; **first:** A structured interviewing questionnaire sheet, **second:** lifestyle assessment sheet and the **third:** maternal and fetal outcome record. **Results:** there were a high statistical improvements in maternal outcomes as women`s experience of delivery, complications of present delivery, presence of post-partum complications, and hospitalization days as the p-value ≤ 0.00. there were a high statistical differences in improvements of the study group compared to control ones regarding fetal outcomes as birth weight, Apgar scores (1st min & 5th min), newborn condition, and neonatal complications p-value ≤0.001. **Conclusion:** There were progressive improvements in birth outcomes after applying standardized evidence-based practices of the study group in compared to the control group p-value ≤ 0.001. **Recommendations:** Increase awareness regarding Standardized Evidence-Based practices regarding preterm in all maternity units.

Keywords: Birth outcomes, Preterm Labor & Standardized Evidence-Based.

Introduction:

Maintaining the safety of the people is a critical aspect of nursing practice. Maternal–child health nurses have the opportunity to concentrate on two populations-women and newborns (**Mary & Kristine, 2018**). Preterm labor (PTL) is one of the most prevalent problems affecting mother and child health. Preterm labor is s characterized by uterine contractions that are frequent and strong enough to cause progressive cervicovaginal effacement and dilation prior to term gestation (between 20 and 37 weeks). Early or late preterm labors are subcategories of preterm labors. Before 33 weeks of pregnancy, was early preterm labor while from 34 - 36 weeks of pregnancy, was late preterm (**ACOG, 2020**).

Preterm labor occurs in around 12% of pregnancies and nearly half of preterm births. Additionally, preterm labor is responsible for 70% of neonatal morbidity, mortality, and medical costs. This is primarily because 2% of mothers give birth to very premature infants who are under 32 weeks gestation (**Michael, 2021**).

An estimated 15 million babies are delivered before 37 full weeks of pregnancy each year. Prevalence ratios are often raised in low- and middle-income countries, while some middle- and high-income countries are seeing an increase (**Hassan & Nasr, 2017**).

Preterm births account for 45–50% of cases, preterm rupture of the membranes causes 30%, and additionally 15-20% required emergency elective preterm births. Preterm birth accounts for 28% of all early neonatal deaths (deaths within the first seven days of life) (**Katayoun et al., 2020**).

The preterm labor -non modifiable factors include ethnicity, maternal age, cervical insufficiency and decreased cervical length. The three most risk factors for preterm labor include a previous history of preterm labor, a current multifetal pregnancy, uterine or cervical abnormalities, repeat cesarean births, nutritional status, and health habits such as smoking, physical activity, and drug use during pregnancy. Overweight or obese women, higher blood pressure, diabetes are more likely to deliver before 37 weeks of pregnancy (**Martin et al., 2019**). Preterm birth is typically unplanned, and pregnant women are feared about the diagnosis, course of treatment, and likely length of hospital stays (**Parfitt, 2021**).

The early warning signs and symptoms of preterm labor include four or more uterine contractions in an hour before 37 weeks of pregnancy, as well as cervical shortening and effacement. Additionally, third-trimester vaginal bleeding, intense pelvic

pressure, or back or abdominal pain may be signs that a preterm birth is started. Cerebral palsy, cognitive delays, hearing impairments, and vision problems are more common in premature infants. When a baby is born early, the risks increase (**National Institutes of Health, 2017 & Petersen et al., 2019**).

Preterm labor is typically diagnosed based on clinical findings, such as presence of regular contractions and cervical dilatation of at least 2 cm, or presence of regular contractions and a change in cervical dilation, effacement, or both. The majority of preterm births are accompanied with either membrane rupture or other health problems requiring delivery (**MacDorman et al., 2021**).

Maternal complications from preterm labor have been linked to a higher risk of cardiovascular death and morbidity, usually years after delivery due to unknown causes, while preterm labor complication to the fetus include poor neurodevelopmental outcomes, cognitive impairment, motor impairments, cerebral palsy, weak development, and loss of vision and hearing. The risk factors increased with decreasing gestational age (**Cnattingius et al., 2021**).

Therefore, Preterm birth is important to be prevented as pregnant women who are at risk for preterm labor should be identified early on and receive effective treatment. Nurses are the first health practitioners meet the pregnant women during antenatal care visits. The main roles of nurses are screening for pregnant women at risk of preterm birth, ensuring that proper treatments are provided, informing pregnant women regarding warning signs, applying acquired prenatal instructions, and providing support throughout pregnancy (**Buayaem et al., 2019**).

However, Standardized Evidence-Based Practices for preterm labor is the most beneficial set of standardized nursing practices targeting toward improving outcomes for preterm labor through organized aspects of care as risk assessment aspect, communication aspect, prenatal aspect, medical regimen aspect, Neuro-protection aspect as well as labor preparation aspect (**Melissa et al., 2018**). The World Health Organization's (WHO) guidelines on managing complications of preterm labor are standardized evidence-based care practices for preterm labor. Published in 2000 and reprinted in 2017 (**Pfister et al., 2019**).

Utilizing such evidence-based practices offered to high-risk pregnancy throughout the antenatal period and to the preterm infant after birth can reduce maternal and neonatal mortality and morbidity from preterm birth. The maternity nurses targeting such interventions that focus on primary prevention and lowering the risk of preterm birth, such as taking a full medical history, determining the pregnancy's

status, monitoring vital signs continuously, measuring intake and output, and encouraging fluid intake, as well as preparing women for an operation or normal labor (**Martin et al., 2019**).

standardized evidence-based practices toward improve maternal outcomes emphasize on supporting women in adopting healthier habits and managing chronic diseases while pregnant, identifying and managing hazards to the mother's health during pregnancy as well as considering the psychosocial aspects and family empowerment. Standardized evidence-based practices improve fetal outcomes through continuous monitoring of fetal condition while pregnant women are on tocolytics to identify any negative effects, monitor uterine contractions, and careful documentation of cervical dilation and effacement call for close observation in an inpatient situation (**Abd El Rhman et al., 2019**).

Significance of research:

Despite the advances in health sector toward women and neonatal health care, that have considerably reduced the mortality and disability of preterm babies, it occurs in about 5 to 15% of all pregnancies and is the prevalent cause of mortality (60 to 80%) during the prenatal period and accounts for 50% of neonatal congenital defects (**Friese, 2019**). In Egypt, preterm birth is estimated for 136,900 neonates and 8,100 neonates' death from preterm birth hazards (**ACOG, 2020**). Preterm infants who survive may have trouble adjusting to adult life due to the rising prevalence of medical disabilities, difficulties with learning, and behavioral and psychological issues (**Moster & Markestad, 2020**).

Nurses have a crucial role in providing care for women at high risk for preterm labor as bedside specialists, advocates, educators, and essential members of the maternity care team. Preterm labor prevention and treatment depend on clinical expertise and current professional understanding. The primary responsibility of nurses is to implement these standardized evidence-based practices that were adopted from international obstetric organizations and approved by the Egyptian Ministry of Health for early identifying of preterm labor warning signs and symptoms enables timely diagnosis, interventions, and treatment (**Griggs et al., 2020**). Toward this aspect the present study was carried.

Aim of the research

The research aimed study the effect of applying standardized evidence-based practices among risk women for preterm labor on birthing outcomes. It was done through:

1. Assessment of associated risk factors, signs, and symptoms of preterm labor among pregnant women (study and control groups) and assessing

the lifestyle of risk women for preterm labor (the study group) pre intervention,

2. Designing and implementing the standardized evidence-based practices regarding preterm labor among risk women for preterm labor.
3. Evaluating the effect of standardized evidence-based practices regarding preterm labor on lifestyle of the study group, and the birth outcomes (study and control groups) post intervention.

Hypotheses

1. Applying standardized evidence-based practices regarding preterm labor will be expected to improve the lifestyle of the study group rather than the control group.
2. Applying standardized evidence-based practices regarding preterm labor will be expected to improve birth outcomes of the study group rather than the control group.

Operational Definitions

Standardized evidence-based practices: Set of prepended objectives (the tailored knowledge and evidence-based practices) used as standard care of preterm labor adopted from evidence-based organizations and guidelines and targeted for improving women's lifestyles and preventing further complications, which include designing pretest, the educational materials, and activities, then post-test for optimization favorable birthing outcomes post-implementation.

Subject and Methods

Research Design:

A quasi-Experimental research design (two groups-pre- posttests) was used. A quasi-experiment is a design where the level of the independent variable is controlled by the researcher, the outcome is measured. Effective methods for evaluating cause-and-effect relationships is quasi-experiments. **(Gopalan, et al., 2021).**

Setting:

The setting was the obstetric emergency unit, obstetric out-patient clinic, and obstetric &gynecological department affiliated with Benha university hospital, Egypt. Which is the main official setting that served the towns and villages around it. Obstetric emergency department: located on the ground level and include of 4 rooms (reception, examination, (prenatal, natal and postnatal) emergency operation & recovery rooms) which receive normal and high-risk pregnancies cases, obstetric emergency cases. Outpatient clinic: diagnosis and follow-up obstetrics cases, while obstetric &gynecological department (internal wards) located on six floors and consist of 10 rooms as 7patient rooms and sonar, examination, major

operation, medical and nursing rounds besides an educational wing) which received admitted follow-up cases, high-risk cases, planned operation lists, and post-operative care.

Sampling

Sample Type: a purposive sample.

Sample Size: 140 pregnant women at high risk for preterm labor attending the previously mentioned setting & met inclusion criteria.

Sample size calculations: the sample size was estimated based on the preceding year's census report of preterm births **[Benha University hospital, 2020]** utilizing the following formula **Oribhabor, et al., (2019):**

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

In which: n= sample size N= total population (450) e= margin error "0.05")(

The total number of samples were (140) diagnosed with high risk for preterm attending the study settings according to the following:

Inclusion Criteria:

1- High-risk pregnant women who exhibit preterm labor symptoms
2- Gestational age of 28 to more than 37 weeks
3- Age below 35 years.
4- Singleton pregnancy and Cephalic presentation.

Exclusion Criteria:

Women with medical complications such as diabetes mellitus, hypertension, cardiac disease, or kidney problems.

Sampling technique

The sample was divided in random selection into two equal groups (70 pregnant women who met the inclusion and exclusion criteria for each study and control group) .The Control group was recruited during the first three months of field work and received routine hospital care while the study group was recruited after that with the same number and received standardized evidence based practices and routine hospital care.
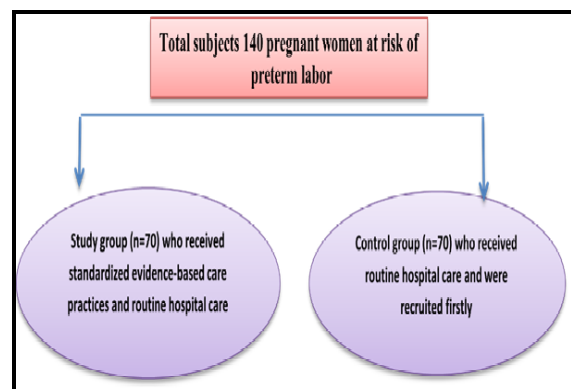

Figure 1: sample technique flow chart

Data Collection Tools
For the present research, three tools were used.
First tool: A structured interviewing questionnaire: established by the researchers after revising the related literature **(Abd El Rhman, et al., 2019)** & **(Alfirevic, et al., 2019)** and written in Arabic language, it included two sections:
part 1: Was used to assess the studied women's general characteristics (as age, level of education, and residence besides anthropometric measures height, weight to assess Body Mass Index), past obstetric history (as gravidity, parity, previous obstetric complications, and type of complications), present pregnancy profile (as the start of antenatal care, regular attendance of follow up visits, and fetal movements), associated factors of preterm labor (as daily activity factors, psychological factors, and sexual factors during pregnancy).
Part 2: Assess associated signs and symptoms of preterm labor before and after applying standardized evidence-based practices, it includes assessment of uterine contraction (regularity, frequency, intensity, and site), and vaginal discharge**.**
Second tool: lifestyle preterm labor assessment:
It was prepared by a researcher to assess the lifestyle of the study group before and after applying standardized evidence-based care practices such as (eating a healthy balanced diet, regular sleep patterns during pregnancy, drinking enough fluids throughout the day, proper personal hygiene as dental, bathing and perineal care, carry heavy things, move excessively, stand up for long periods of times without periods of rest and practice breathing exercises to be more relax) It contained (8) multiple choice questions .the scoring system was Yes= (2) score and No = (1) score.
Third tool: Maternal and Fetal Outcome Record: which includes.
 Part I: Maternal outcomes for record complications as the presence of preterm birth, mode of delivery, the onset of labor, women `s experience of delivery, complications of present delivery, presence of post-partum complications, and hospitalization days.
Part II: Fetal outcomes for record birth weight, Apgar score at 1st minute, Apgar score at 5th minute, newborn condition, and neonatal complications.
Development of the Study Tools
Content Validity
The researchers previewed the recent literature related to the current study title including the current national and international papers and scientific journals. Then design tools for data collection. To test the content validity, the tools were reviewed by five experts, three experts in the maternity nursing field, and two experts in obstetric medicine. The tools were modified according to the experts' advice.

Reliability of Tools
Using Cronbach's alpha score to test the reliability of tools. Cronbach's alpha coefficients for second tool reliability were equal to 0.74 while the third tool reliability was equal to 0. to 78, consequently, the reliability of the tools was established.
Ethical considerations:
At the beginning of the study, every woman was informed of the study objectives and advantages. Before beginning the data collection, each woman gave the written consent. The study's confidentiality was always maintained. Every woman who participated in the study became aware that the participation is voluntary. Before doing the current study, obtain written approval from the Benha University nursing faculty's ethical committee REC-OBSN-P.
Approval
The manager of Benha University Hospital and the head of the obstetrical and gynecological departments were agreed on an official letter from the Dean of the nursing faculty stating the study`s title and purpose, and a written consent was obtained from the sample before starting the data collection and research process.
Pilot Study
After the data collecting tools were ready, they were pretested on 10% of the study population (14 pregnant women). The tools' applicability and clarity were assessed, as well as the feasibility of fieldwork and any potential barriers. The length of time required to finish the tools was also determined by the pilot study. No changes were made because the standardized evidence-based practices and the tool's content were understandable and clear and pilot sample were included in the main study sample.
Research Process and Field Work
The researcher attended the study setting 3 days a week from 9:00 am to 12:00 pm (from the beginning of September 2022 to the end of May 2023). Fieldwork included the following phases:
Preparatory phase:
It was started by revising the relevant literature to the tools of data collection, obtaining an official approval from the head of obstetrical and gynecological departments and study sample, and finally conducting the pilot study to assess practicability of tools.
Assessment phase:
This phase encompassed interviewing studied women with inclusion criteria during their scheduled antenatal visits to collect baseline data, explained the aim of the study, and frequency of standardized evidence-based practices of preterm labor sessions to assure adherence to selected interventions.

Implementation Phase:

- Designed standardized evidence-based practices regarding preterm labor was implemented in a prepared room in the antenatal clinic for the discharged pregnant women and followed care in home and in the obstetric &gynecological department in the mentioned setting for the hospitalized women.

- The researchers then took the women's written consent to participate in the study and given a structured interviewing questionnaire (Tool-I) to assess the general characteristics, past obstetric history, present pregnancy profile, and associated factors besides signs and symptoms of women at risk of preterm labor pre-intervention.

- There were 3-6 women (1-2 women/day) interviewed weekly, each sheet took an average of 5 to 10 minutes to answer.

- Four theoretical sessions were applied to the study group, each session lasting about 20-30 minutes, lecture, discussion, and brainstorming which were used as a method of teaching to facilitate given instructions.

  • The objective of 1st session was to establish rapport and communication with the studied women and discussed the concept of preterm labor, associated risk factors, signs and symptoms and importance of following standardized evidence-based practices in order to attain more positive outcomes.

  • The 2nd session includes applying standardized evidence-based practices aspects such as prenatal aspect to measure vital signs, measure weight and height, assess for signs of infection, observe signs and symptoms of preterm labor, continuous fetal monitoring, and explain medical regimen as the physician orders.

  • The objective of 3rd session was to avoid additional complications through given enforcement to the study group on the importance of adopting a healthy lifestyle as eating balanced diet food rich in vitamins, calcium, and omega 3 fatty acids. monitoring weight regularly during pregnancy, drink enough fluids through the day, proper personal hygiene as dental, bathing and perineal care, avoid carrying heavy things, avoid move excessively, avoid standing up for long periods of times without periods of rest and finally practice breathing exercises to be more relaxed.

  • In the 4th session, the researchers provide comfort measures and assess signs and symptoms of labor and prepare women for operation or normal labor if there are cervical changes.

- For the study and control groups, it was observed after two & four weeks to assess signs and symptoms of preterm labor (tool I part two)

Evaluation Phase

The researchers follow up and evaluate high-risk pregnant women after applying standardized evidence-based practices was completed. The posttest was gathered at the time of delivery to assess birth outcomes (maternal and fetal outcomes). The control group was evaluated utilizing the third tool "maternal and fetal outcomes sheet" while the study group was evaluated utilizing the second tool "Lifestyle assessment sheet" which were the same pretest and also the third tool "maternal and fetal outcomes sheet".

Standardized evidence-based practices

It was used as standard care of preterm labor adopted from evidence-based organizations and guidelines as **((WHO, 2018), (Queensland Clinical Guidelines. 2019), (NICE,2020)) and** includes six aspects with directed practices as **risk assessment aspect**; obtaining a complete history of women, review current pregnancy follow up a profile to determine the status of pregnancy, perform a physical examination. **Communication aspect**; empower women with appropriate knowledge about multi-disciplinary health team, and encourage verbalization of fears and answer questions especially information regarding contractions pattern and fetal status .**prenatal aspect**; continuous measure vital signs (pulse, blood pressure, temperature, and respiration), measure weight and height of women at admission and then daily weight to record in a chart, assess for signs of infection, perform single digital or sterile speculum vaginal examination, initial and continuous fetal monitoring. **Medical regimen aspect**; administer medications and IV fluids as appropriate: prophylactic antibiotics, antenatal corticosteroids, and tocolytics, as prescribed. **Neuro-protection aspect**; encourage fluid intake between 2000and 3000 ml\day, unless forbidden. Monitor for hot flashes, drowsiness, visual disturbance, or respiratory depression. **Labor preparation aspect**: If there are signs of labor prepare women for operation or normal labor if there are cervical changes, provide comforts measures (e.g. bed rest, backrubs, change of position, decrease stimuli in a room), and manually palpate the abdomen to ascertain the strength of contraction and fetal heart sounds and prepares women for operation or normal labor if there are signs of labor as cervical changes.

Risk assessment aspect

Review History

• Medical, surgical, obstetric, social

Assess for signs and symptoms

• Pelvic pressure • Lower abdominal cramping • Lower back pain • Vaginal loss–mucous, blood, fluid • Regular uterine activity

Communication aspect

• Counsel women, and refer to appropriate clinicians in the multidisciplinary team (as appropriate) about modifiable risk factors

• Control of underlying chronic diseases.

• reduces risk Lifestyle (e.g. balanced diet, activity limitations, stress management)

• Perform a psychosocial assessment and encourage verbalization of fears

Consider admission if

• Cervical dilation or • Cervical change over 2–4 hours or • ROM or • Contractions regular and painful or • Further observation or investigation

Discharge

• Provide information about signs and symptoms and returning for care • Arrange

Prenatal aspect

continuous measure vital signs (pulse, blood pressure, temperature, and respiration), measure weight and height of women at admission and then daily weight to record in a chart, assess for signs of infection, perform single digital or sterile speculum vaginal examination, initial and continuous fetal monitoring.

Medical regimen aspect

administer medications and Iv fluids as appropriate: prophylactic antibiotics, antenatal corticosteroids, and tocolytics, as prescribed.

Neuro-prote*ction aspect*

• encourage fluid intake between 2000and 3000 ml\day, unless forbidden. Monitor for hot flashes, drowsiness, visual disturbance, or respiratory depression

Labor aspect

• prepare women for operation or normal labor if there are cervical changes, provide comforts measures (e.g. bed rest, backrubs, change of position, decrease stimuli in a room), and manually palpate the abdomen to ascertain the strength of contraction and fetal heart sounds and prepares women for operation or normal labor if there are signs of labor as cervical changes
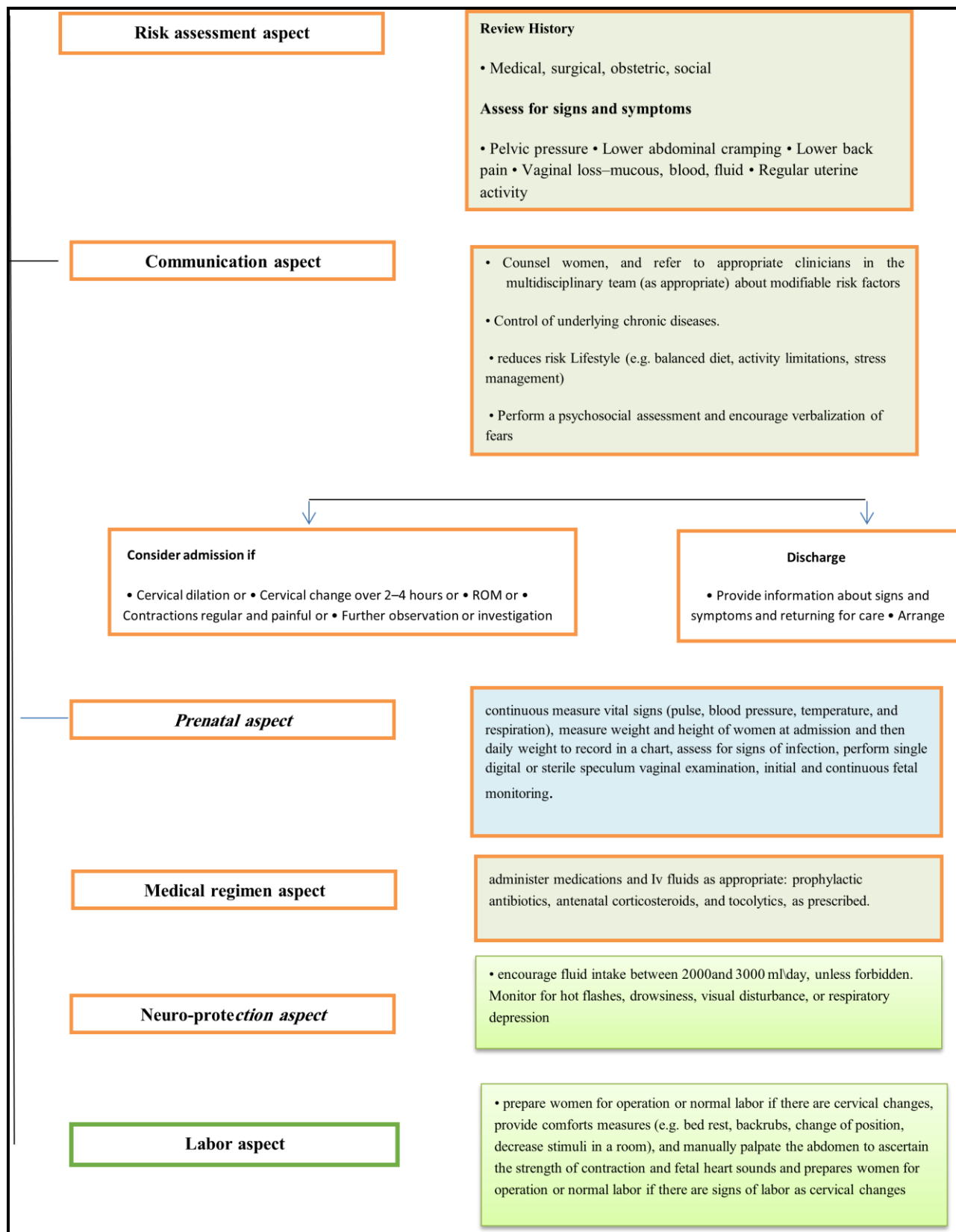
Figure (2): Standardized evidence-based practices flow chart

Statistical Design

The gathered raw data was coded and analyzed using SPSS version 24.0. The information was then shown using frequencies and percentages from descriptive statistics. For comparison, quantitative variables were shown as means and standard deviations. The test score reliability measure of a sample is Cronbach's (alpha). A difference that was highly significant was found at $P < 0.01$, a difference that was non-significant was found at $P > 0.05$, and statistical significance was assessed when p-value 0.05.

Limitations of the Study:

Standardized evidence-based practices sessions were accomplished almost individually; it spent more exertion and time in follow-up and evaluations. A lack of national studies applied to the research topic.

Results:

Table (1): Distribution of studied women regarding general Characteristics (n= 140).

Item	Study		Control		X^2	p-value
	No. (70)	%	No. (70)	%		
Age						
<20 years	34	48.6	26	37.1	16.2	0.070 [ns]
20-35 years	16	22.8	21	30.0		
More than 35 years	20	28.6	23	32.9		
X-±SD	**26.9±6.27**		**26.7±7.11**			
Level of education					7.80	0.02 [ns]
Primary education	4	5.7	10	14.3		
Secondary education	37	**52.9**	45	**64.3**		
Higher education	29	41.4	15	21.4		
Residence						
Rural	41	**58.6**	36	**51.4**	1.40	0.23 [ns]
Urban	29	41.4	34	48.6		
Occupation						
Worked	42	**60.0**	41	**58.6**	0.03	0.86 [ns]
Housewife	28	40.0	29	41.4		

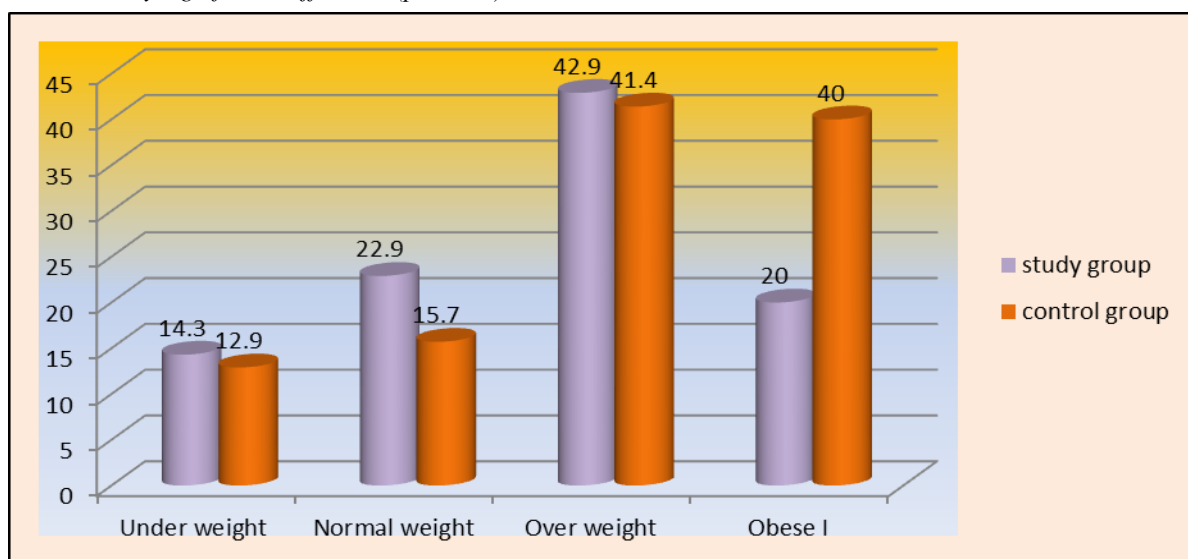[ns] *no statistically significant difference (p > 0.05)*

Figure (3): Distribution of the studied women regarding BMI categories.

Table (2): Distribution of studied women regarding past obstetric history (no= 140).

Item	Study		Control		X^2	p-value
	No. (70)	%	No. (70)	%		
No of gravidity						
<2	34	48.6	35	50.0	0.02	0.86 [ns]
>2	36	**51.4**	37	**52.9**		
No of parity						
<2	32	45.7	26	37.1	7.42	0.06 [ns]
>2	38	**54.3**	44	**62.9**		
Type of past delivery						
Vaginal delivery	22	31.4	25	35.7	5.37	0.10 [ns]
Cesarean section	48	**68.6**	45	**64.3**		
Previous obstetric complications						
Yes	41	**58.6**	42	**60.0**	4.30	0.14 [ns]
No	29	41.4	28	40.0		
Type of complications						
Pre-term births	17	**24.3**	19	**27.1**	5.24	0.21 [ns]
Vaginal infection	10	14.3	12	17.1		
Anemia	13	18.6	10	14.3		
Gestational diabetes	1	1.4	1	1.4		

[ns] *no statistically significant difference (p > 0.05)*

Table (3): **Distribution of studied women regarding present pregnancy profile (pre-intervention) (no= 140).**

Item	Study		Control		X^2	p-value
	No. (70)	%	No. (70)	%		
fetal movement						
Good	62	**88.6**	61	**87.1**	0.86	0.35 [ns]
Poor	8	11.4	9	12.9		
Start of antenatal care						
After 3 months	20	28.6	34	48.6	5.90	0.51 [ns]
Before 3 months	50	**71.4**	36	**51.4**		
Regular attendance of follow-up visits						
Yes	70	**100.0**	68	**97.1**	2.02	0.15 [ns]
No	0	0.0	2	2.9		

ns no statistically significant difference (p > 0.05)

Table (4): **Distribution of studied women regarding associated factors of preterm labor (pre-intervention) (no= 140).**

Item	Study		Control		X^2	p-value
	No. (70)	%	No. (70)	%		
Daily activity factors						
Exposed to external trauma	8	**11.4**	9	**12.9**	0.86	0.35 [ns]
Workload with house and work activities	18	25.7	23	32.9		
Home activities (carrying heavy objects)	17	24.3	21	30.0		
Psychological factors						
Presence of anxiety or fears	42	**60.0**	40	**57.1**	4.11	0.70 [ns]
exposure to stress	4	5.7	5	7.1		
Sexual Factors during pregnancy (natural sexual relationship) after pregnancy						
As usual	70	**100.0**	68	**97.1**	2.02	0.15 [ns]
Decreased	0	0.0	2	2.9		
Presence of sexual relations at signs of preterm labor	27	38.6	26	37.1		

[ns] *no statistically significant difference (p > 0.05)*

Table (5): Distribution of studied women regarding signs and symptoms of preterm labor before and after applying Standardized Evidence-Based practices (no.= 140).

Items	Study group			Control group			X²	p-value
	Before	At 2 weeks	At 4 weeks	Before	At 2 weeks	At 4 weeks		
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)		
Uterine contraction								
Regularity								
Irregular	0 (0.0)	70 (100.0)	51 (72.9)	0 (0.0)	44 (62.9)	33 (47.1)	14.52	**0.021***
Regular	70 (100.0)	0 (0.0)	19 (27.1)	70 (70.0)	26(37.1)	37(52.9)		
Frequency								
10 minute	16(22.8)	0(0.0)	5 (7.1)	18 (25.7)	11(15.7)	15 (21.4)	15.21	**0.014***
30 minute	30(42.9)	10 (14.3)	21(30.0)	32 (45.7)	24(34.3)	20 (28.6)		
1hr	20 (28.6)	45(64.3)	40 (57.1)	18 (25.7)	25(35.7)	31 (44.3)		
2hr	4 (5.7)	15(21.4)	4 (5.7)	2 (2.8)	10(14.3)	4 (5.7)		
Intensity								
Mild	0 (0.0)	60 (85.7)	65 (92.9)	0.0	25(35.7)	20(28.6)	11.23	**0.001****
Moderate	68 (97.2)	0 (0.0)	5 (7.1)	69 (98.6)	24(34.3)	45(64.3)		
Sever	2 (2.8)	10(14.3)	0 (0.0)	1(1.4)	21(30.0)	5(7.1)		
Site								
Abdomen	0 (0.0)	36 (51.4)	38 (54.3)	2 (2.8)	43(61.4)	9 (12.9)	9.24	**0.002****
Back	0 (0.0)	34 (48.6)	20 (28.6)	4 (5.7)	26(37.1)	44 (62.8)		
Abdomen and back	70 (100.0)	0.0	12 (17.1)	64 (91.4)	11(15.7)	17 (24.3)		
Vaginal discharge								
White	32 (45.7)	0 (0.0)	15(21.4)	40 (57.1)	25 (35.7)	20 (28.6)	13.10	**0.001****
Colorless	38 (54.3)	55 (78.6)	70(100.0)	30 (42.9)	45 (64.3)	50 (71.4)		

[ns] *no statistically significant difference (p > 0.05)*   [**] *A highly statistically significant difference (P ≤ 0.001).*

Table (6): Lifestyle of preterm labor before and after applying Standardized Evidence-Based practices among study Group (no.= 70).

Item	Before		After		X²	p-value
	No	%	No	%		
Eat a healthy balanced diet						
No	44	62.9	10	14.3	15.74	0.001**
Yes	26	37.1	60	85.7		
Regular sleep patterns during pregnancy						
No	55	78.6	21	30.0	14.30	0.000**
Yes	15	21.4	49	70.0		
Drink enough fluids throughout the day						
No	22	31.4	3	4.3	19.72	0.001**
Yes	48	68.8	67	95.7		
proper personal hygiene as dental, bathing, and perineal care						
No	13	18.6	44	62.9	9.21	0.001**
Yes	57	81.4	26	37.1		
Carry heavy things						
No	58	82.9	65	92.9	17.12	0.001**
Yes	12	17.1	5	7.1		
Move excessively						
No	30	42.9	59	84.3	21.01	0.000**
Yes	40	57.1	11	15.7		
Stand up for long periods without periods of rest						
No	50	28.6	12	17.1	16.91	0.003**
Yes	20	71.4	58	82.9		
Practice breathing exercises to be more relaxed						
No	70	100.0	8	11.4	27.05	0.001**
Yes	0	0.0	62	88.6		

[**] *A highly statistically significant difference (P ≤ 0.001).*

Table (7): Distribution of the studied women regarding maternal outcomes (n=140).

Items		Study group n=70)		Control group n=70)		X^2	p-value
		No	%	No	%		
Presence of preterm birth	Yes	18	25.7	38	54.2	3.41	0.04*
	No	52	74.3	32	45.7		
Mode of delivery	Vaginal delivery	15	21.4	18	25.7	1.205	0.651 ns
	Cesarean section	55	78.6	52	74.3		
Onset of labor	Spontaneous	41	58.6	12	17.1	7.68	0.004**
	Induced	29	41.4	58	82.6		
Women `s experience of delivery	Satisfactory experience	45	64.3	24	34.3	9.87	0.000**
	Un satisfactory experience	15	21.4	46	65.7		
complications of present delivery	Premature rupture of membrane	15	21.4	26	37.1	31.84	0.000**
	Meconium-stained liquor	10	14.3	17	24.3		
Presence of post-partum complications	Postpartum hemorrhage	7	10	11	15.7	16.45	0.001**
	Puerperal sepsis within 1st 24hr after delivery	2	2.9	8	11.4		
Hospitalization days	One day	58	82.6	41	58.6	8.16	0.012*
	Two days and more	12	17.1	29	41.3		

ns no statistically significant difference (p > 0.05),   A statistically significant difference (P ≤ 0.05),
** A highly statistically significant difference (P ≤ 0.001).*

Table (8): Distribution of studied women regarding the fetal outcomes (no= 140).

Item	Study group (n=70)		Control group (n=70)		X^2	p-value
	No	%	No	%		
birth weight						
Normal	58	82.9	50	71.4	20.3	**0.000****
Abnormal	12	17.1	20	28.6		
Apgar score at 1st min						
Poor	35	42.8	40	57.1	82.7	**0.000****
Good	35	57.2	30	42.9		
Apgar score at 5th min						
Poor	15	21.4	28	40.0	85.1	**0.000****
Good	55	78.6	42	60.0		
Newborn conditions						
Good	66	94.3	59	84.9	75.1	**0.000****
Admitted Incubator	4	5.7	11	15.7		
Neonatal complications						
Respiratory distress	3	4.3	10	14.3	20.3	**0.000****
Diabetes	1	1.4	1	1.4		

** A highly statistically significant difference (P ≤ 0.001).*

Table (1): Shows that the mean ± SD of the study group was 26.9±6.27 years and the control group was 26.7±7.11 years, (52.9) % of the study group had a secondary education, and (58.6) % of them were from rural areas, as opposed to (64.3%) of the control group had a secondary education and were (51.4)of the study group's from rural areas. Both the study group (60.0%) and the control group (58.6%) worked.
Figure (3): Represents the BMI categories of the studied women, as (42.9%), (41.4%) of the study and control groups respectively were in overweight categories, (20.0%) of the study group and (40.0%) of the control group were obese class I.

Table (2): Indicates no statistical differences between the study and control group regarding the past obstetric history (gravidity, parity, type of past delivery, and previous obstetric complications). Additionally, (24.3%) (27.1%) of the study and control groups as well have previous preterm births.
Table (3): Shows that the study (88.6%) group and control (87.1%) groups felt good fetal movement. both the study group (71.4%) and the control group (51.4%) started antenatal care before three months of pregnancy. And also, (100.0%) & (97.1%) of both the study and control groups regularly attended follow-up visits.

Table (4): Shows that (60%), (57.1%) of the study and control groups as well presented with anxiety or fears. (100.0%), (97.1%) of the study and control group as well sexual relations during pregnancy were as usual

Table (5): Presents that there were statistically significant improvements of regularity and interval of uterine contraction among the study group compared to control groups p-value <0.05 and there were highly statistically significant improvements of intensity and site of uterine contraction at four weeks in the study group compared to the control group p-value ≤ 0.001. Also, (100.0%) of the study groups reports colorless vaginal discharges at four weeks of utilizing standardized evidence-based nursing practices compared to (71.4%) of the control group.

Table (6): Demonstrates progressive improvements in all items of lifestyle practices of the study group after applying standardized evidence-based practices compared to before as p-value ≤ 0.001.

Table (7): Reveals that only (25.7%) of the study group have preterm birth compared to (54.2%) of the control groups. (78.6%), (74.3%) of the study and control respectively their mode of delivery was a cesarean section. Regarding the onset of labor (58.65%) of the study group was spontaneously compared to (17.1%) of the control group. And additionally, there were highly statistical improvements in items of maternal outcomes as women`s experience of delivery, complications of present delivery, Presence of post-partum complications, and Hospitalization days in the study group compared to control group as the p-value (P ≤ 0.001).

Table (8): Reveals that there were high statistical differences improvements in fetal outcomes of the study group compared to control ones as of birth weight, Apgar score at first minute, and at fifth minute, newborn condition, and neonatal complications as p-value ≤0.001.

Discussion:
Preterm labor and birth represent a significant public health concern with both financial and societal repercussions. The ability to provide consistent and effective nursing care will undoubtedly achieve better outcomes. Therefore, maternity nurses should be well trained in both theoretical and practical skills as well as provide the fundamental knowledge and procedures to pregnant women at risk of preterm labor securely **Hassan & Nasr, (2017).** Nurses should work with other health professionals to determine the efficacy of therapy, as well as the causes of preterm labor. If prematurity has become national concern with increasing public & professional awareness, toward utilizing standardized

evidence practices, it will reduce the incidence of preterm labor. **Queensland Clinical Guidelines (2020).**

Concerning general characteristics, the present research revealed that studied women age were (<20->35) years old among both groups (study & control). These findings agreed with the study of **Abd El Rhman et al., (2019)** stated that the age of studied groups at high risk for preterm labor were range from (<18->34) years old. Also, **Gaiva, et al., (2017)** demonstrated that the likelihood of preterm birth is influenced by a woman's age. Younger women under the age of 20 and over the age of 34 were high risk of preterm labor. Moreover, **Auger et al., (2019)** the relationship between maternal age and preterm birth rates in Denmark showed that the risk of preterm labor rose with decreasing women's ages, reaching to 10 times higher in women under the age of 16 years. In another study, **Fuchs, et al., (2018)** who comparing the women ages between 25 and 29 years and found that the age over 35 years had 2.6 more preterm births per 100 live births. Since the advance age women has preexisting illnesses like diabetes and hypertension, which both raise risks in the growth of the placenta and fetus, put pregnancy at risk for preterm birth.

The present research findings revealed that about two thirds of the study and control groups had secondary education. That concluded that preterm labor was more common among women with a low level of education. These findings were in the same line with **Abd El Rhman et al., (2019) & Abd-Elhakam et al., (2020)** who proved that more than half of the study and control groups had secondary education. Additionally, **Assunçao, et al (2017)** stated preterm was linked to women with low levels of education. This may be due to the women with less education engaged in bad lifestyle and not aware enough with its potential risks throughout the life stages.

Concerning residence and occupation, present research results denoted that more than half of study and control groups were from the rural area and worked. These results were in contrasted with **Abd-Elhakam et al., (2020)** stated that about three-quarters of both the control and study groups were housewives. This difference may be due to the difference of the inclusion criteria of studied population between two studies.

Regarding body mass index the present research results proved that more than two-fifths of the control and study group were in the overweight category and one-fifth were in the obese category these results agreed with **Abd El Rhman et al., (2019)** represented that around two-thirds of the sample had body mass index were overweight, Also, **Khatibi, et al ., (2020)** found that Pregnant people

who are overweight or obese are more likely to experience preterm labor than normal-weight women since the largest risks are seen for preterm births. This may be contributed that Egyptian women ignore eating healthy balanced diet.

Finally, the present research findings proved that there was no statistically significant difference in the general characteristics of either group (P > 0.05). These findings indicate that the two study groups were homogeneous. This was in the same line as **Azin et al., (2021)** showed that there were no statistically significant variations between the intervention and control groups in the sociodemographic traits (P > 0.05). Also, the study results was similar to **Elzeblawy & Hamdy's (2017)** who pointed out that, With relation to age, educational attainment, occupation, and monthly income, there was no statistically significant difference between the study and the control groups. On another hand, this research disagreed with **Katayoun, et al., (2020)** who presented that the educational status p-value was 0.8, and the age variable's (p-value) was 0.38. And the p-value for the between-pregnancy time interval was 0.79, indicating no statistically significant differences. Concerning the occurrence of preterm labor and parity, the current study found that more than half of the control and study groups were multiparas and had previously given birth via cesarean section. These results agreed with **Abd El Rhman et al., (2019)** who stated that two third of both groups were multi-Para. Also, these findings were matched with **Kartikasari, (2018)** in a study titled "the relationship between preterm labor risk factors and multiple parities" has revealed that multiple parities are a risk factor for premature labor. Also, these results agreed with **Shakir, (2018)** concluded that women who have had previous Caesarean sections in the past are more likely to experience premature labor.

Moreover, the current study revealed that mothers in both groups had a history of anemia and vaginal infection. These results agreed **Adnin & Dewi (2022)** reported that pregnancy-related anemia causes preterm labor to occur 1.53 times more frequently. Anemia-afflicted pregnant women complain of altered placental function as well as a disruption in the transfer of nutrients and oxygen from the mother to the fetus. Additionally, it might cause a delay in fetal growth; preterm birth, maternal mortality, and possibly fetal mortality are some potential outcomes. Also, these results agreed with **Fox, et al., (2019)** who showed that vaginal infections, pregnancy-induced hypertension, gestational diabetes, vaginal hemorrhage, and placenta problems were the most frequent factors that increased the risk of preterm labor.

Concerning associated factors of preterm labor, the present research results revealed that more than half of both control and study groups displayed anxiety or fears. These findings were in the context of **Caroli, et al., (2016)** who revealed that mothers of preterm infants are more than twice as likely to experience fear and stress during pregnancy than mothers of term infants. These findings may contribute to that psychological factors participate in the occurrence of preterm labor as the studied women experienced anxiety from the fear thoughts about their fetus, life, and delivery.

The present research documented that all studied women had a usual sexual relationship in late pregnancy pre-intervention This finding demonstrated that having sex in the latter stages of pregnancy releases prostaglandin. Cervical dilatation, uterine contractions, and labor duration were all significantly affected by prostaglandin hormone. These findings agreed with **Fox, et al., (2019)** who clarified that preterm labor is more likely to occur as there are more sexual encounters.

Concerning signs and symptoms of preterm labor before and after applying Standardized Evidence-Based practices, the current research results concluded that at four weeks, the uterine contractions of three-quarters of high-risk women in the study group were improved, compared to fewer than half of high-risk women in the control group. Additionally, at four weeks with applying standardized evidence-based nursing practices, the study group's vaginal discharges became colorless. These findings were agreed with **Abd El Rhman et al., (2019)** who proved that after four weeks, the uterine contractions of more than two thirds (68.3%) of high-risk women were improved. Only (21.7%) of high-risk women in the control group experienced an improvement in uterine contractions, however after following up for one month of using nursing practices recommendations, the intervention group's vaginal secretions became colorless.

Regarding the lifestyle among the study group, the present study results demonstrated significant improvements in all items of lifestyle practices of the study group after applying Standardized Evidence-Based practices compared to before as p-value ≤ 0.001. These results pointed out the attention toward the significant relation between lifestyle and risk of preterm labor. Which were agreed with **Tsai et al., (2018) who** demonstrated that preterm labor was linked to poor nutritional intake in both the underweight and overweight & obese categories.

Moreover **Dereje, et al., (2020)** stated that pregnant women who consume a diet rich in green vegetables, salad, fruit, and nuts have a lower risk of preterm labor, especially if it's the first child. And also it has

been suggested that there is a causal relationship between diet, infectious bacteria, and preterm labor. This is because an unhealthy diet encourages the growth of infectious bacteria in the vaginal and gut flora, which either move up to the uterus and cervix or cause inflammation by being transported through the bloodstream. Also, **Meers , & Nowakowski (2022)** stated that Poor sleep during early and late stages of pregnancy is associated with an increased risk of premature labor. Therefore, during pregnancy, medical professionals should urge moms to get enough sleep (8 hours of bedtime).

Moreover, **Wagle et al., (2018)** mentioned that dental caries is a common oral health issue during pregnancy; pregnant women are more susceptible to it than non-pregnant mothers. Inflammation brought on by dental caries can raise the chance of premature labor.

The use of standardized evidence-based interventions for the prevention of preterm labor, such as healthy balanced diets, normal sleep patterns during pregnancy, and good personal hygiene practices including dental, bathing, and perineal care, may have had an impact on all the above improvements in the current study and also approved the first study hypothesis which titled "Applying standardized evidence-based practices regarding preterm labor was expected to improve the lifestyle of the study group rather than the control group. These findings were matched with **(Fox, et al., 2019)** who stated that preterm labor incidence was significantly reduced after applying protocol of practices, and preterm labor symptoms were improved.

Concerning maternal outcomes, the present research revealed that one-quarter of the study group experience preterm birth as opposed to more than half of the control groups. More than three-quarters of the study and control respectively mode of delivery was a cesarean section. Regarding the onset of labor more than half of the study group was spontaneously as opposed to less than one-fifth of the control group. And additionally, there were high statistical improvement in the variables of women `s experience of delivery, complications of present delivery, presence of post-partum complications, and hospitalization days as the p-value (P ≤ 0.001).

Also the above findings went in the context with **(Turienzo, et al., 2020)** in a study titled " Midwifery care versus standard care for women at risk of preterm birth " of 162 registered women with preterm labor and found that more women in the study group (57.4%) spontaneously gave birth than in the control group (24.4%). Additionally, it was discovered that 2.0% of women experienced intrapartum problems compared to 40.0% of the control group.

These results agreed with a study titled the Best management practices in prevention of preterm birth which conducted by **(Morgan, et al., 2021)** and resulted in a significant reduction in preterm births and delivery complications as sepsis and hemorrhage while assured that cesarean section is the preferred type of delivery to reduce the maternal risks (such as maternal hemorrhage).

According to the results of the current study, there were highly statistical differences between the study group's improvements and those of the control group in terms of fetal outcomes such as birth weight, Apgar scores at the first and fifth minutes, newborn condition, and neonatal complications, with a p-value of 0.001. The present results were in context with that of **(Allen, el al., 2015)** in a study titled Does the model of maternity care affect birth outcomes for young women and presented that reducing preterm birth is possible when involved the women early as possible in proper antenatal care and health services as reported a 50% reduction in preterm birth in the case care group in comparison to those receiving routine antenatal care only .

From the above results The second study hypothesis which stated " Applying standardized evidence-based practices regarding preterm labor was expected to improve birth outcomes of the study group rather than the control group" was achieved .this result was in same line with **(Di Jin, et al., 2022)** reported that more comprehensive use of evidence-based practices regarding preterm labor was associated with improved survival without complications among very preterm infants born at <32 weeks gestational age. This finding supported also by **(Kildea, 2019)** who concluded significant reduction in preterm birth after providing standard practices for high risk women for preterm labor and considered the practices as a strategy to improve health and birth outcome.

Conclusion:

Based on the current research`s findings, it was proved that the research hypotheses were accepted, as all items of lifestyle practices of the study group after applying standardized evidence-based practices showed progressive improvements compared to before p-value ≤ 0.001. There were highly statistical improvements in items maternal outcomes as women`s experience of delivery, complications of present delivery, Presence of post-partum complications, and Hospitalization days of the study group compared to control group as the p-value (P ≤ 0.001), as well as there were highly statistical differences in improvements in fetal outcomes of the study group compared to control ones as of birth weight, Apgar score at first min, and at fifth min,

neonatal complications and newborn condition as p-value ≤0.001.

Recommendations:
Considering the findings of the study the following recommendations were suggested:
- Increase awareness regarding Standardized Evidence-Based practices regarding preterm in all maternity units.
- Integrated standardized evidence-based practices as routine hospital care for the prevention of preterm labor.

References:
- **Abd El Rhman, S., Hassan S., & Khedr, N., (2019):** Effect of Utilizing Nursing Care Guideline for Prevention of Preterm Labor IOSR Journal of Nursing and Health Science (IOSR-JNHS) e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 8, Issue 2 Ser. II. (Mar. - Apr .2019), PP 60-70 www.iosrjournals.org DOI: 10.9790/1959-0802026070 www.iosrjournals.org 60.
- **Adnin, A., & Dewi, D. (2022):** The Relationship of Anemia in Pregnant Women and the Incidence of Premature Delivery: Systematic Review. J Health Promot Behav. 07(01): 67-76. https://doi.org/10.26911/-thejhpb.2022.07.01.07.thejhpb.2022.07.01.07.
- **Allen, J., Gibbons, K., Beckmann M., Tracy, M., Stapleton, H., & Kildea, S., (2015):** Does model of maternity care make a difference to birth outcomes for young women?A retrospective cohort study. International Journal of Nursing Studies 2015; 52(8):1332–42.
- **Alfirevic, Z., Milan, S., & Livio, S., (2019):** Caesarean section versus vaginal delivery for preterm birth in singletons. Cochrane Database Syst Rev., 12(9) Sep CD000078.doi: 10.1002/14651858.CD000078.pub3.PMID: 24030708
- **American College of Obstetricians and Gynecologists, (2020):** Management of preterm labor. Practice Bulletin No. 171. 128: e155–64. Obstetrics & Gynecology: October 2016 - Volume 128 - Issue 4 - p e155-e164.
- **Assunço, P., Novaes, H., Alencar, G., Melo, A., Almeida, M., (2017):** Prevalence and risk factors related to preterm birth in Brazil, Reproductive journal; 28 (6):1078-90.
- **Auger, N., Abrahamowicz, M., Wynant, W., (2019):** Gestational age-dependent risk factors for preterm birth: Associations with maternal education and age early in gestation. European Journal of Obstetrics & Gynecology and Reproductive Biology, 176, 132-136.
- **Azin A., Razmjoue P., Ali M., Sakineh D., & Saeideh Sh. (2021):** Maternal predictive factors for preterm birth: A case–control study in Southern Iran. Journal of Education and Health Promotion | Published by Wolters Kluwer – Medknow. DOI: 10.4103/jehp.jehp_668_20.
- **Benha University Hospital, (2021):** Medical and statistical records of preterm birth annual flow rate.
- **Buayaem, T., Yapan, P., & Pongprasobchai, S., (2019):** Nursing Care for Pregnant Women at Risk of Preterm Labor, Ramathibodi Nursing Journal, 25 (3) 243-254.
- **Caroline, L., Johanna, L., Gunilla, S., & Ann, J., (2016):** Effect of maternal stress during pregnancy on the risk for preterm birth, 2016, BMC Pregnancy and Childbirth, (16), 5.
- **Cnattingius, S., Villamor, E., Johansson, S., Bonamy, A., Persson M., Wikström A., & Granath F., (2021):** Maternal obesity and risk of preterm delivery. JAMA. 2021 Jun 12; 309(22):2362-70.
- **Dereje, G., Michael, W., & Gita, D. (2020):** Effects of maternal diets on preterm birth and low birth weight: a systematic review388(10063):3027-35.2020 Feb 28;123(4):446-461. doi: 10.1017/S0007114519002897. Epub 2019 Nov 12. DOI: 10.1017/S0007114519002897.
- **Di Jin, A., Xinyue, G., Siyuan Jiang, C., Yanchen Wang, B., & Tongling Yang Yulan, L.,(2022):** The Association between Evidence-Based Healthcare Practices and Outcomes among Preterm Births in China Neonatology 2022;119:26–32 .DOI: 10.1159/000519846.
- **Elzeblawy, H. & Hamdy, E. (2018):** Improving nurses' knowledge and skills regarding tocolytics for inhibiting preterm labor Clinical Nursing Studies, DOI: 10.5430/CNS.v5n1p1, 2018, Vol. 5, No. 1, http://dx.doi.org/10.5430/cns.v5n1p1.
- **Friese K., (2019):** The role of infection in preterm labour. BJOG: an international journal of obstetrics and gynaecology, 110 Suppl 20, 52–54. https://doi.org/10.1016/s1470-0328(03)00025-9
- **Fox R., Jamie K., Paul L. , Aye C., & Adam, J., (2020):** Preeclampsia: Risk Factors, Diagnosis, Management, and the Cardiovascular Impact on the Offspring. Received: 8 September 2020; Accepted: 2 October 2020; Published: 4 October 2020.
- **Fuchs, F., Monet B., Ducruet, T., Chaillet, N., & Audibert, F. (2018):** Effect of maternal age on the risk of preterm birth: A large cohort study. PLoS ONE 13(1): e0191002. https://doi.org/10.1371/journal. pone.
- **Gaiva, M., Fujimori, E., & Sato A., (2017):** Pediatric patient classification system: improvement of an instrument. Rev Esc Enferm USP [Internet]. [Cited 2017 Dec 10]; 48 (5):778-86. Available from: http://www.scielo.br/pdf/reeusp/v48n5/0080-6234-reeusp-48-05-787.pdf.

- **Gopalan, M., Rosinger K., & Ahn J., (2021):** Use of Quasi-Experimental Research Designs in Education Research: Growth, Promise, and Challenges; Volume: 44 issue: 1, page(s): 218-243 https://doi.org/10.3102/0091732X20903302.

- **Gracimary, A., Jovanka, B., Thais, RL., Flavio ,C., & Larissa, M., (2016):** Obstetric History and Maternal Complications Related to Preterm Birth, International Medical Society DOI: 10.3823/2092, Vol. 9 No. 221

- **Griggs M., Hrelic A., Williams N., & McEwen-Campbell, M., (2020):** Preterm Labor and Birth: A Clinical Review Lippincott ®Nursing Center.

- **Hassan, E., & Nasr, E., (2017):** Improving nurses' knowledge and skills regarding tocolytics for inhibiting preterm labor, Article in Clinical Nursing Studies DOI: 10.5430/cns.v5n1p1 URL: http://dx.doi.org/10.5430/cns.v5n1p1.

- **Katayoun, B., Lorzadeh, N., Pournia, Y., Birjandi, M., Ebrahimzadeh, F., & Aziz, K., (2020).** Factors associated with preterm delivery in women admitted to hospitals in Moradabad: A case-control study.

- **Kartikasari, R., (2018):** Hubungan faktor risiko multiparitas dengan persalinan preterm. Skripsi. Program Studi Div Kebidanan Fakultas Kedokteran, Universitas Sebelas Maret, Surakarta.

- **Kildea, S., Gao Y., Hickey., Kruske, Si., Nelson., Blackman, R., Tracy, S., Hurst, C., Williamson, D., (2019):** Reducing preterm birth amongst Aboriginal and Torres Strait Islander babies: Aprospective cohort study, Australia , E-Clinical Medicine J., 12 (2019) 43–51 ,https://www.journals.elsevier.com/ eclinical medicine.

- **Khatibi, A., Brantsaeter, L., & Sengpiel, V., (2020):** Prepregnancy maternal body mass index and preterm delivery. Am J Obstet Gynecol. 2012;207(3):e1-e7, e7 Lewis, Writer S Mom's Diet Linked to Risk of Preterm Birth.

- **Liu, L., Oza S., Hogan, D., Chu, Y., Perin J., Zhu, J., (2016):** Global, regional, and national causes of under-5 mortality in 2000-15: an updated systematic analysis with implications for the Sustainable Development Goals. Lancet,

- **MacDorman MF., Callaghan W., Mathews T., Hoyert L., Kochanek K.,2021.** Trends in preterm-related infant mortality by race and ethnicity: the United States, Available at: : http://www.cdc.gov/info DHHS Publication No. 2021–1120 • CS257783.

- **Mario ,R. and Carlo, k., (2018):** Barriers to and Interventions that Increase Nurses' and Parents' Compliance with Safe Sleep Recommendations for Preterm Infants, Volume 22, issue 1, p24-39.DOI:https://doi.org/10.1016/j.nwh.2017.12.009.

- **Meers J. , &Nowakowski ,S., (2022**).Sleep During Pregnancy2022 Aug;24(8):353-357.PMID: 35689720,DOI: 10.1007/s11920-022-01343-2
Doi: 10.1007/s11920-022-01343-2. Epub 2022 Jun 11.

- **Michael,G., (2021):** Preterm Labor Medscape Logo news & perspective drugs & diseases & education academy video decision point drugs , obstetrics & gynecology updated: May 04,

- **Martin, J., Hamilton, B., & Osterman, M., (2018).** Births in the United States , Hyattsville National Center for Health Statistics; 2019. NCHS Data Brief No. 346. https://www.cdc.gov/nchs/data/databriefs/db346-h.pdf. Accessed November 25, 2019.

- **Morgan A., Mendonça M., Thiele N., &David A., (2021):** Management and outcomes of preterm birth, BMJ 10(136), https://orcid.org/0000-0003-4143-1977BMJ 2022; 376:e055924 http://dx.doi.org/10.1136/bmj-2021-055924 Published: 10 January 2022

- **Moster D., Lie R., & Markestad T., (2020):** Long-term Medical and Social Consequences of Preterm Birth. N Engl J Med 2020; 359:262-73.

- **National institute for health and care excellence (NICE), (2017):** Clinical Knowledge Summary, Nausea/vomiting in pregnancy, Published: June 2017.

- **Oribhabor, C. & Anyanwu, C., (2019):** Research Sampling and Sample Size Determination: A Practical Application. 2. 47-56.

- **Parfitt S. (2021):** Preterm labor and birth), AWHONN's Perinatal nursing, (5th ed., pp. 142-181),© Wolters Kluwer.

- **Petersen, E., Davis, N., & Goodman, D., (2019):** Racial/ethnic disparities in pregnancy-related deaths—the United States, 2007–2016. MMWR Wkly;68(35):762765.https://www.cdc.gov/mmwr/volumes/68/wr/mm6835a3.htm?s_cid=mm6835a3_w Accessed November 25, 2019.

- **Pfister, R., Soll, R., & Wiswell, E., (2019):** Protein-containing synthetic surfactant versus protein-free synthetic surfactant for the prevention and treatment of respiratory distress syndrome. Cochrane Database Syst Rev. 2019; 4:CD006180.

- **Queensland Clinical Guidelines, (2020):** Preterm labor and birth. Guideline No. MN20.6-V9-R25. Queensland Health. June 2020. Available from: http://www.health.qld.gov.au/qcg.

- **Shakir P., (2018):** Maternal and Neonatal Adverse Outcome at Repeat Cesarean Delivery versus Repeat Vaginal Delivery. Journal of the College of Physicians and Surgeons Pakistan, Vol. 21 (2): 84-87

▪ **Tsai, I., Chen, C., Sun, F., Wu, CH., & Yeh, L., (2018):** Associations of the pre-pregnancy body mass index and gestational weight gain with pregnancy outcomes in Taiwanese women. Asia Pac. J. Clin. Nutr., 21, 82–87.

▪ **Turienzo, C., Bick, D., Briley, L., Bollard, M., Coxon, K., Cross P., Silverio, S., Singh C., Seed, P., Tribe R., Shennan, A., & SandallID J., (2020):** Midwifery continuity of care versus standard maternity care for women at increased risk ofpreterm birth, PLOS Medicine, 17(10, https://doi.org/10.1371/journal.pmed.1003350 October 6, 2020

▪ **Wagle M., D'Antonio F., & Reierth E., (2018):** Dental caries and preterm birth: a systematic review and meta-analysis. BMJ Open,(8)18, doi:10.1136/ bmjopen-2018-018556-et al.