

## Effect of Utilizing Nursing Care Guideline for Prevention of Preterm Labor

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### **Abstract:**

**This study aimed** to evaluate the effect of nursing care guideline for prevention of preterm labor. **Study Design:** Quasi experimental study.

**Setting:** This study conducted in High Risk Units at Obstetrics Department of Mansoura University Hospital Egypt.

**Sample:** Purposive sample involved 120 high risk pregnant women actual diagnosed preterm labor divided, equally into two groups' (60 control and 60 interventions).

**Tools:** Two tools were used for data collection: An interview questionnaire schedule and life style, daily activity assessment sheet.

**Results:** Anemia, vaginal infection and pregnancy induced hypertension were common complains during current pregnancy among both groups. There is more than two third had improvement regarding signs and symptoms of preterm labor of intervention group compared to control group. There was statistical significance difference regarding time of delivery among two groups ( $p=0.03$ ). Life style and behaviors of pregnant women for avoiding preterm labor pre and post utilizing of nursing care guideline among intervention group were highly statistical significance ( $p<0.001$ ).

**Conclusion:** Utilizing nursing care guideline was more effective for reducing signs and symptoms of preterm labor.

**Recommendations:** Nursing care guideline for prevention of preterm labor should be used as hospital routine care.

**Keyword:** preterm labor, Nursing care guideline

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### I. Introduction

Preterm labor is defined as labor of the baby before 37th completed week calculated from first day of the last menstrual period. A preterm infant constitutes two-third of low birth weight babies. (WHO., 2014 ). Preterm labor considers the most serious complication in obstetrics and increase the load in healthcare finances. In addition, it account for 85% of neonatal morbidity and mortality global. (Norwitz, Caughey., 2011).Furthermore it is a leading reason of death in children more than five years, is responsible for near one million deaths per year, and a leading cause of chronic disability, straining the Medicaid budgets of most states. (WHO, 2014).

Any pregnant woman having persistent uterine contractions as presence of 4 contractions every 20 minutes. If uterine contractions cause cervical effacement over 80% or dilation over 1 cm. She is documented as being in actual labor rather than having false labor contractions. ( Pillitteri., 2014).The reason of premature delivery is often idiopathic. But gestational diabetes, preeclampsia, multiple pregnancies, low body mass index (BMI), obesity, intrauterine infection that leads to an activation of the immune system, cigarette smoking, and maternal psychological and social stress are the major risk factors for preterm labor. It is recommended that delivery not be medically induced before 39 weeks unless required for other medical reasons. (WHO., 2014).

Worldwide more than one in ten babies are born prematurely every year, estimated 15 million preterm babies. Annually over one million die from complications of their prematurity. ( Liu et al, 2015). In the first month of life prematurity is the leading cause for death and preterm neonates are raised danger for post-neonatal mortality and a wide range of respiratory, infection, metabolic and nervous system morbidities ( Katz et al., 2013).

Prematurity has short and long-term complications which include anemia, fatigue, respiratory distress syndrome, kernicterus, dysplasia, bleeding into or around the abdominal, intraven-tricular hemorrhage,

retinopathy, bacterial or fungal sepsis, necrotizing enterocolitis problems. (Cunningham et al., 2010). Many of the babies who survive face greater risks of major health problems and disability throughout their lives. It includes, visual, hearing problems and learning disabilities,. So costs on healthcare and society is raised.( WHO, 2012)

Nursing care for preterm labor has not decreased the occurrence of premature delivery but has been primarily aimed to improve health of preterm babies and delay labor until a fetus reaches a level of maturity that will allow a newborn to survive in the outside environment. ( Pillitteri., 2010). In addition nurses play important role for premature delivery including (monitoring fetus and mothers when using tocolytic to distinguish the side effect. Close monitoring in an inpatient setting is indicated for fetal & maternal safety, uterine contractions, Careful record cervical dilatation & effacement. Fetal surveillance is also necessary, and generally includes monitoring fetal heart rate continuously. (Herman et al., 2016

Also, Nurse should be focuses on helping mothers to achieve a healthy lifestyle modification and manage chronic conditions during pregnancy. Counseling mothers with a set of nursing interventions that aim to identify and modify social and biomedical behavioral risks to mother's health or outcome of pregnancy throughout prevention and management" such as immunizations, maintains a healthy pregnancy weight and exercise regimen, gets adequate sleep and cessation smoking and alcohol. Additionally nurse should be also encompasses maternal psychosocial factors, such as psychological wellbeing, support of family and counseling. Proper nursing care helps in reducing risk factors and reduces adverse pregnancy outcomes. (Chandranipapongse & Koren, 2013).

### **Significance of the study:**

Preterm birth is the most common cause of death among infants worldwide. About 15 million babies are born too early every year. That is more than 1 in 10 babies. Approximately 1 million children die each year due to complications of preterm birth.(Liu, Oza, Hogan, Chu, Perin & Zhu., 2016).The chance of survival at less than 23 weeks is close to zero, while at 23 weeks it is 15%, 24 weeks 55% and 25 weeks about 80% (Cloherty & John., 2012) The chances of survival without long term difficulties are lower.(Jarjour, 2015).

In Egypt, the vast majority of the preterm labor studies emphasized on medical intervention, thus, little is thought about the nursing role. As nurses are the ones who responsible for administration and follow up selective tocolytic therapy to pregnant women in preterm labor as well as helping mothers to achieve a healthy lifestyle and manage chronic conditions during pregnancy their perspectives on the effectiveness of their care are very important. (Elzeblawy & Hamdy., 2017).So, the present study is very important as it was directed our attention to utilize nursing care guideline for prevention of preterm labor. Because, proper nursing care helps in reducing risk factors, reduces adverse pregnancy outcomes, improving health of preterm baby and delay labor until a fetus reaches a level of maturity. In addition, this study didn't conduct at Mansoura University Hospital. So, this study was conducted to encourage utilizing of nursing care guideline for prevention of PTL.

## **II. Aim**

This study aims to evaluate the effect of utilizing of nursing care guideline for prevention of preterm labor.

### **Research hypotheses:**

Women who will utilize nursing care guidelines will expect to deliver within the expected time of delivery.

### **Study design:**

Quasi experimental study.

### **Setting:**

The study was conducted at high risk units of obstetrical and gynecological department at Mansoura University Hospital, Mansoura city, Dakahlia governorate, Egypt. It consisted of 4 departments (9,10,15, 18) each department had hot day for receiving high risk pregnant women, department 9 hot day (Sunday),department 10 hot day (Saturday), department 15 hot day( Monday)and department 18 hot day (Thursday, each case receiving medical and nursing care. Each department contains on 28 beds)

**Type of sample:** This study included 120 women who were selected by Purposive sampling technique.

### **Study Subject:**

Involved pregnant women who were diagnose preterm labor at high risk units.

**Sample Size:**

In this study, a sample size was 120 women 60 in each group. This study group received nursing care guideline and control group received routine hospital care.

**Inclusion Criteria:**

- High risk pregnant women with signs and symptoms of preterm labor
- Gestational age between 26-37 weeks.

**Tools:**

It was designed by the researcher based on reviewing the related literature review.

**First tool:** A structured Interview schedule was divided into 5 parts as following:

**Part I**

It includes general characteristics of pregnant women :(Age, level of education, BMI, Smoking and Phone number.), Past and present obstetrical history such as ( Last menstrual period, gestational age, EDD, Gravidity, parity, abortions, Type of delivery, previous preterm labor and previous obstetrical problems). It included (11) multiple choose questions which answer yes or no. Scoring system Yes= (2) score and No = (1) score.

**Part II**

This part included data to assess associated risk factors for preterm labor such as: Current pregnancy problems included (Anemia, pregnancy induced hypertension, vaginal infection, gestational diabetes and suffer from any health problem during pregnancy). Psychological factors included :( fear, anxiety and Stress).Sexual factors included: (Nature sexual intercourse after pregnancy, times and number). It was designed by the researcher to assess associated risk factors for preterm labor. It included (11) multiple choose questions. Scoring system Yes= (2) score and No = (1) score.

**Part III**

This part included data to assess signs and symptoms of preterm labor: uterine contractions (frequency, intensity, location and duration of pain). Pelvic pressure symptoms (increased urinary frequency and pain). Vaginal discharge (type of discharge, amount of discharge and bloody show present or not).Membranes condition (rupture or intact).It included (8) multiple choose questions. Scoring system Yes= (2) score and No = (1) score.

**Second Tool: Life style and activity assessment sheet**

This tool was prepared by researcher to assess life style and daily activity pre and post utilizing of nursing care guidelines among intervention group such as (diet, personal hygiene, rest, physical activities, exercise, smoking, follow up during pregnancy and sexual relation) It included (18) multiple choose questions. Scoring system Yes= (2) score and No = (1) score

**Operational Design:**

This study established different phases, the preparatory phase, the pilot study phase, field work, phase of analysis of data, phase of presentation of results in it is final form and discussion.

**The preparatory phase:**

Analysis of the previous and present local and international associated with literature by using books, articles and scientific journals was done by the researcher, this assisted the researcher to be familiar with the problem and guided in the process of tools designing, and the tools were then offered to specialists for assessment the validation.

**The pilot study phase:**

The study tools were applied on 10% of total sample size (12 women) before starting the data collection. The purposes of pilot study were to assess validity of study tool to determine feasibility and viability understand ability of data collection and to detect any problems prior to data collection and to estimate the time needed to complete the tool. Sample size of pilot study excluded from the total sample size

**Field of work:**

- The researcher attended to the study setting 3 days \ ws from 9: 00 Am to 3: 00 Pm until the sample size completed.

- Firstly, the researcher introduced herself to each women then researcher explained the aim of the study for each women.
- Written informed consent for participation in the study obtained from every woman.
- The total study sample 120 high risk pregnant women divided into equal number for two groups.
- The first 60 women attended high risk units assigned to control group while the second 60 women assigned to a study group .High risk pregnant women in both groups had received routine hospital care.

**Implementation phase:**

- Women in the study group received nursing care guidelines that provide women with healthy life style that help in prevent preterm labor.
- Researcher started to collect socio-demographic data from participants, and then started to collect reproductive history, risk factors associated with preterm labor( psychological risk factors and sexual risk factors)
- After that assess presence of signs and symptoms of preterm labor then the researcher assess life style and daily activity for study group before utilizing of nursing care guideline like (diet, personal hygiene, rest, physical activities, exercise, smoking, follow up during pregnancy and sexual relation)

**Evaluation phase:**

- Finally, the researcher assesses and follows up high risk pregnant women after utilizing of nursing care guideline on reducing signs and symptoms of preterm labor among intervention group.

**Statistical Analysis:**

The collected data was coded, tabulated and analyzed using statistical package of social science (SPSS) for windows version 20.0 (SPSS, Chicago, IL). All data were categorical and were expressed in number and percentage, mean ± SD. Chi-square test was used for comparison of variables with categorical data. Statistical significance was set at p<0.05.

**Ethical Consideration:**

Before conducting the study the researcher obtained an approval from head of department of women health & midwifery nursing department then from the ethical committee at faculty of Nursing of Mansoura University. Also the researcher was obtained approval after clarifying the aim of study from director of Mansoura University Hospital to carry out the study. After that written informed consent was obtained from each participant after explaining the purposes of the study, each participant had right to withdraw from the study at any time.

**III. Results**

**Table 1: Sociodemographic Data among Intervention and Control Group:**

Items	Intervention Group (n=60)		Control Group n=60		Chi square test	
	NO.	%	NO.	%	χ <sup>2</sup>	P
<b>Age (years)</b>						
<18	17	28.3	21	35.0	5.008	0.287
19 – 23	13	21.7	10	16.7		
24 – 28	10	16.7	7	11.7		
29 – 34	6	10.0	13	21.7		
>34	14	23.3	9	15.0		
<b>Mean ± SD</b>		<b>23.9 ± 4.2</b>		<b>24.1± 4.7</b>		
<b>Educational level</b>						
Preparatory	15	25.0	10	16.7	1.487	0.475
Secondary	30	50.0	31	51.7		
University	15	25.0	19	31.7		
<b>Occupational status</b>						
House wife	30	50.0	25	41.7	0.839	0.360
Working	30	50.0	35	58.3		
<b>Smoking</b>						
No	4	6.7	10	16.7	2.911	0.088
Yes( negative)	56	93.3	50	83.3		
<b>Body Mass Index</b>						
Normal	22	36.7	18	30.0	0.600	0.439
Overweight	38	63.3	42	70.0		

Table one shows that around one third of intervention and control group regarding their age, it was (<18 years) which constituted (28.3%-35.0%) respectively. Concerning educational level, about around half of both groups had secondary education. In addition, majority of mothers in two groups exposed to negative smoking and around two third of both groups had body mass index (overweight) (63.3%-70.0%) respectively.

**Table 2. Reproductive History among Intervention and Control Groups:**

Items	Intervention Group (n=60)		Control Group (n=60)		Chi square test	
	NO.	%	NO.	%	$\chi^2$	P
<b>Gravidity</b>						
Nulli	14	23.3	12	20.0	3.038	0.219
Primi	2	3.3	7	11.7		
Multi	44	73.3	41	68.3		
<b>Parity</b>						
Nulli	14	24.1	12	21.8	2.182	0.336
Primi	0	0.0	2	3.6		
Multi	44	75.9	41	74.5		
<b>Type of delivery</b>						
Vaginal delivery	15	34.1	10	23.3	1.247	0.264
Cesarean section	29	65.9	33	76.7		
<b>Gestational age (weeks)</b>						
26 – 28wks	9	15.0	25	41.7	11.418	0.010
29 – 31wks	10	16.7	10	16.7		
32 – 34wks	38	63.3	23	38.3		
35 – 37wks	3	5.0	2	3.3		
<b>Time of delivery</b>						
Within the expected date	41	68.3	25	41.7	8.620	0.003*
Before expected date	19	31.7	35	58.3		
<b>Previous obstetrical problems</b>						
Pre-term labor	15	34.1	22	51.2	2.593	0.107
Vaginal infection	20	43.5	25	52.1	0.697	0.404
Anemia	30	65.2	27	56.2	0.791	0.374
Pregnancy induced hypertension	14	30.4	15	31.2	0.007	0.932
Bleeding	2	4.3	9	18.8	4.715	0.030
Gestational diabetes	15	32.6	12	25.0	0.664	0.415
Placental previa	15	32.6	12	25.0	0.664	0.415

Table two describes that, women with multi gravida were highly distributed percentage among the study group and control group (73.3%-68.3%) respectively and more than three quarter of multiparaous women among both groups (75.9%-74.5) respectively. It was found that more than half of women among intervention and control group were delivered cesarean section, (65.9%- 76.7%) respectively and more than one third of women in study had history of preterm labor. Around two third regarding gestational ages was (32- 34 weeks) among intervention. While among control group more than two fifth gestational ages was (26-28 weeks). Also, anemia, vaginal infection and gestational diabetes were common during past pregnancy complains among both groups.

**Table 3. Associated Risk Factors of Preterm Labor among Intervention and Control Group:**

Items	Intervention group (n=60)		Control group (n=60)		Chi square test	
	NO.	%	NO.	%	$\chi^2$	P
<b>Current Pregnancy Problems</b>						
Vaginal infection	25	41.7	30	50.0	0.839	0.360
Anemia	30	50.0	30	50.0	0	1.000
Pregnancy induced hypertension	22	36.7	20	33.3	0.147	0.702
Gestational diabetes	18	30.0	24	40.0	1.319	0.251
Placenta previa	20	33.3	16	26.7	0.635	0.426
<b>Psychological factors</b>						
<b>Feeling of fear</b>						
From delivery	60	100.0	60	100.0	0	1.000
From delivery ,on life and baby	14	23.3	15	25.0	16.034	<0.001*
Fear on life	7	11.7	0	0.0		
Fear on baby	15	25.0	5	8.3		
From delivery ,on life and baby	24	40.0	40	66.7		
<b>Feeling of Anxiety</b>						

Exposing to Stress	No	10	16.7	5	8.3	1.905	0.168		
	Yes	50	83.3	55	91.7				
	No	20	33.3	15	25.0	1.008	0.315		
	Yes	40	66.7	45	75.0				
<b>Sexual Factors ( Nature of Sexual Relationship)</b>									
After Signs of Preterm Labor Number of Coitus after pregnancy	As usual	14	23.3	15	25.0	32.042	After Pregnancy <0.001*		
	Decreased	46	76.7	45	75.0				
	Stopped	60	100.0	60	100.0			0	1.000
	Twice per week (as usual)	14	23.3	15	25.0				
	Once per week	46	76.7	45	75.0			32.042	<0.001*

Table three shows associated risk factors among both groups. **Current Pregnancy Problems**, Anemia, vaginal infection and pregnancy induced hypertension were common pregnancy complains. It was found that **psychological factors** all women among intervention and control groups were feel of fear. Also, concerning to causes of fear ( 40.0%-66.7%) respectively among intervention and control groups were from delivery, on her life and fear on her baby).Concerning **sexual factors** found that more than three quarter of women in intervention and control group their nature of sexual relationship was changed after pregnancy and decreased to ( once per week) and three quarter of women in control group nature of sexual relationship after pregnancy still as usual (twice per week).While all women among both groups sexual relationship stopped after signs and symptoms of preterm labor.

**Table 4. Signs and Symptoms of Preterm Labor Pre and Post Utilizing of Nursing Care Guideline among Intervention and Control Groups.**

Items	Intervention Group						Control Group						P
	Before (n=60)		After 2 Weeks (n=60)		After 4 Weeks (n=60)		Before (n=60)		After 2 Weeks (n=60)		After 4 Weeks (n=60)		
	N	%	NO.	%	NO	%	NO.	%	NO.	%	NO.	%	
<b>Uterine contraction</b>													
<b>Regularit y</b>													
Irregular	0	0.0	60	100.0	41	68.3	0	0.0	34	56.7	25	41.7	
Regular	60	100.0	0	0.0	19	31.7	60	100.0	26	43.3	35	58.3	<0.001
<b>Frequenc y</b>													
5 minutes	6	10.0	0	0.0	0	0.0	22	36.7	0	0.0	7	11.7	
10 minute	30	50.0	0	0.0	10	16.7	38	63.3	35	58.3	28	46.7	
15 minute	24	40.0	0	0.0	0	0.0	0	0.0	25	41.7	0	0.0	
2 hours	0	0.0	60	100.0	9	15.0	0	0.0	0	0.0	25	41.7	
3 hours	0	0.0	0	0.0	41	68.3	0	0.0	0	0.0	0	0.0	<0.001
<b>Intensity</b>													
Mild	0	0.0	60	100.0	41	68.3	25	41.7	53	88.3	25	41.7	
Moderate	23	38.3	0	0.0	0	0.0	0	0.0	7	11.7	0	0.0	
Strong	37	61.7	0	0.0	19	31.7	35	58.3	0	0.0	35	58.3	<0.001
<b>Site</b>													
Abdomen	0	0.0	12	20.0	16	26.7	13	21.7	28	46.7	12	20.0	
Back	0	0.0	28	46.7	34	56.7	3	5.0	23	38.3	13	21.7	
Back and abdomen			20	33.3	10	16.7	44	73.3	9	15.0	35	58.3	<0.001
<b>Pelvic</b>													

pressure													
No	0	0.0	6	10.0	11	18.3	0	0.0	13	21.7	12	20.0	
Yes	60	100.0	54	90.0	49	81.7	60	100.0	47	78.3	48	80.0	<0.001
Vaginal discharge													
Color													
White	25	41.7	10	16.7	0	0.0	30	50.0	15	25.0	5	8.3	
Colorless	35	58.3	50	83.3	60	100.0	30	50.0	45	75.0	55	91.7	<0.001
Amount													
Mild	35	58.3	50	83.3	60	100.0	30	50.0	45	75.0	55	91.7	
Moderate	15	25.0	10	16.7	0	0.0	15	25.0	10	16.7	5	8.3	
Severe	10	16.7	0	0.0	0	0.0	15	25.0	5	8.3	0	0.0	<0.001
Rupture of the membranes													
No	60	100.0	60	100.0	41	68.3	60	100.0	58	96.7	25	41.7	
Yes	0	0.0	0	0.0	19	31.7	0	0.0	2	3.3	35	58.3	0.003*

Table four shows that around more than two third of high risk women their uterine contractions after four weeks were improved around more than two third of women among intervention group (68.3%). Although, only two fifth of high risk women (41.7) among control group their uterine contractions were improved. Also, vaginal discharges become colorless after four weeks of utilizing nursing care guidelines among intervention group. More two third of women among intervention group had intact membranes. Although, more than half of women among control group preterm premature rupture of membranes.

Table 5. Life Style of Pregnant Women Pre and Post Utilizing of Nursing Care Guidelines among Intervention Group

Items	Pre (n=60)		Post (n=60)		Chi square test	
	NO.	%	NO.	%	$\chi^2$	P
Eat healthy balanced diet (foodsrich in omega 3 fatty acids, vitamins and calcium.						
No	44	73.3	20	33.3	19.286	<0.001
Yes	16	26.7	40	66.7		
Monitor your weight regularly and maintain your weight during pregnancy.						
No	45	75.0	21	35.0	19.394	<0.001
Yes	15	25.0	39	65.0		
Take enough fluids a day						
No	42	70.0	15	25.0	24.361	<0.001
Yes	18	30.0	45	75.0		
Exposure for pressure from work and home works						
No	30	50.0	25	41.7	0.839	0.360
Yes	30	50.0	35	58.3		
Carry heavy things						
No	18	30.0	52	86.7	39.634	<0.001
Yes	42	70.0	8	13.3		
Move excessively						
No	23	38.3	48	80.0	21.558	<0.001
Yes	37	61.7	12	20.0		
Stand up for long periods and travels constantly						
No	10	16.7	49	81.7	50.714	<0.001
Yes	50	83.3	11	18.3		
Practice exercises that help to relax( breathing exercises)						
No	60	100.0	50	83.3	10.909	<0.001
Yes	0	0.0	10	16.7		
Taking medication to help you relax without going back to the doctor						
No	47	78.3	55	91.7		

Yes	13	21.7	5	8.3	4.183	0.041
<b>Number of hours of sleep in night</b>						
6-8 hours	58	96.7	45	75.0		
10 hours	2	3.3	15	25.0	11.582	<0.001
<b>Do you sleep during the day</b>						
No	12	20.0	0	0.0		
2 hours	48	80.0	13	21.7		
3 hours	0	0.0	47	78.3	79.082	<0.001
<b>Practice the vaginal self-care continuously</b>						
No	38	63.3	20	33.3		
Yes	22	36.7	40	66.7	10.812	<0.001
<b>Changes underwear continuously</b>						
No	28	46.7	22	36.7		
Yes	32	53.3	38	63.3	1.234	0.267
<b>Number of changes of under wear</b>						
One	10	31.2	10	26.3		
Two	22	68.8	3	7.9		
Three	0	0.0	25	65.8	39.214	<0.001*
<b>Clean your teeth regularly</b>						
No	43	71.7	27	45.0		
Yes	17	28.3	33	55.0	8.777	0.003*
<b>Follow up your teeth regularly with your dentist</b>						
No	60	100.0	30	0.0		
Yes	0	0.0	30	100.0	120.000	<0.001
<b>Number of visits for your dentist</b>						
No	60	100.0	30	50.0		
One	0	0.0	30	50.0	741.798	<0.001*
<b>Avoid exposure for smoking</b>						
No	46	82.1	15	42.9		
Yes	10	17.9	20	57.1	15.042	<0.001*

Table five illustrates that life style and behaviors of pregnant women for avoiding preterm labor pre and post utilizing of nursing care guidelines among intervention group were highly statistical significance ( $p < 0.001$ ).

#### IV. Discussion

The aim of the present study was to evaluate the effect of utilizing of nursing care guideline on prevention of preterm labor. This aim significantly was achieved through supporting the study hypotheses that are women who will utilized nursing care guideline will expected to deliver within the expected time of delivery. So the research hypotheses were accepted.

In relation to age and occurrence of preterm labor the current study showed that occurrence of preterm labor was in age from (<18->34) among two groups. These findings agreed with the study of **Gaiva, Fujimori & Sato., (2014)** who stated that women's age affect on the occurrence of preterm labor. Adolescent women (under the age of 20) and those with an older age (older than 34 years old) presented in relation with preterm labor. Also, **Auger & Hansen., (2013)** contribution of maternal age to preterm birth rates in Denmark and Quebec showed that the danger of PTL increased with the decrease in women's age, which can reach a relative risk of 10 times higher in women up to the age of 16 years old.

In another study, **Martins, Santo, Sousa, et al., (2011)** stated that women over the age of 35 had 2.6 more premature deliveries out of 100 births than women between the age of 25 and 29 years old. Because mothers of advanced maternal age are at risk for preterm birth due to having preexisting conditions as diabetes, hypertension, and that both increase risk factors with development of the placenta, growth of the fetus, and can cause preterm labor. Women younger than 18 had greater chances for developing severe preeclampsia, eclampsia, poor fetal growth, fetal distress and postpartum hemorrhage. (**Cavazo-Rehg, Krauss, et al., 2015**).As regard level of education and occurrence of preterm labor the present study cleared that PTL was more common among low educated women (secondary).These findings in the same line with **Assunção, Novaes, Alencar,et al (2012)** factors associated with preterm birth in Brazil who stated that women with an inadequate educational level were associated with prematurity.



Also, **Santos, Costa, Amaral, et al (2014)** conducted that danger for PTL increased in women with less education when compared with those with higher levels of education. Education can be considered as a variable determined by socioeconomic conditions. Concerning overweight and occurrence of PTL the present study found that more than half of mothers in study and control group were overweight. These results consistent with **McDonald, Han, Mulla, et al., (2009)** shown that overweight is associated with preterm labor before 32 weeks and induced prematurity before 37 weeks.

Also, **Khatibi, Brantsaeter & Sengpiel., (2012)** found that maternal overweight and obesity during pregnancy were associated with increased risk for preterm labor. The highest risks were observed for extremely preterm deliveries specifically, compared with normal-weight women. As regarding occurrence of preterm labor and exposure to smoking the present study showed that majority of mothers exposed for negative smoking this findings in the same line **Flood & Malone., (2012)** who stated that smoking (positive or negative) in pregnancy has been major risk factor for preterm labor.

Concerning occurrence of preterm labor and parity the present study conducted that two third of both groups multi Para. This findings agreed with **Kartikasari., (2010)** correlation of multi parity risk factors with preterm labor in Sebelas Maret University, suggested that multi para is a risk factor for PTL. Regarding occurrence of PTL and mode of delivery the present study revealed that half of mothers in both group mode of delivery were cesarean section. These results agreed with **Shakira., (2011)** conducted that risk for preterm labor is increased in women with history of multiple caesarian section.

Concerning occurrence of preterm labor and reproductive history the present study shows that mothers in both group had previous history of preterm labor, vaginal infection, anemia, pregnancy induce hypertension, placenta problems and gestational diabetes. This results agreed with **Assunção., (2012) and Gracimary, Teixeira1, Jovanka, et al., (2016)** stated that the previous history of preterm labor was one risk factor associated with prematurity. Previous prematurity was responsible for influencing by up to 2.37 times episodes of preterm birth in subsequent pregnancies.

In addition, **Yi, Han, & Ohrr., (2013)** reported that anemia in pregnant women contributes 1.53 times against PTL. Pregnant women with anemia, complain from disruption delivery of oxygen and nutrients from the mother to the placenta and fetus, the function of the placenta affected. Also, it can lead to impaired fetal growth. In addition it can also reason for abortion, puerperal sepsis, prematurity and maternal, even fetus mortality.

Concerning physical risk factors and occurrence of preterm labor. The present study revealed that vaginal infection, pregnancy induced hypertension, gestational diabetes and, vaginal bleeding and placenta problems were the most common problems that cause preterm labor. These findings agreed (**Mousa., 2013**) showed that vaginal infection, pregnancy induced hypertension, gestational diabetes and, vaginal bleeding and placenta problems were the most common problems that increased risk factor for PTL.

Regarding psychological factors and occurrence of preterm labor. **Caroline, Johanna, Gunilla & Ann., (2016)** that maternal stress, fear and anxiety during pregnancy is more than twice as common among mothers who gave PTL compared to mothers who gave birth at term. The vast majority of mothers exposed to stress during pregnancy, no matter what the origin or level of the stress, anxiety and fear were, gave PTL because of the exposure of stress as an attributable factor. This findings in the same line with the present study it found that the majority of mothers in both groups exposed to stress, anxiety and fear about her fetus, life and from delivery.

Regarding sexual risk factors and occurrence of preterm labor. The present study stated that there was highly statistical significant among both groups regarding sexual risk factors this result illustrated that sexual relation in late pregnancy will release of prostaglandin. Prostaglandin hormone had important effect on outcome of labor increase uterine contractions, cervical dilatation and decrease duration of the labor.

This findings agreed with (**Mousa., 2013**) clarified that increase number of sexual intercourse increase occurrence of preterm labor. As regard to time of delivery and occurrence of preterm labor the present study clarified that there is differences among two groups in the present study more than half of mothers time of delivery was within the expected date otherwise the control group more than half of mothers time of delivery were before the expected date.

This result is in the same line with **Hodnett, Fredericks & Weston., (2010)** confirmed that contains follow up throughout the pregnancy and health education regarding signs and symptoms of preterm labor. Psychosocial support and nutritional counseling; increase gestational age and decrease rate of occurrence of PTL. Because it supplements the fetus with necessary requirement from balanced diet, correct of any physical and psychological problems that can affect the fetus.

**Tsai, Chen, Sun & Yeh., (2012)** demonstrated that improper dietary intake in both underweight and overweight & obese groups was associated with PTL. Also, **Lewis & Writer., (2014)** stated that pregnant mothers, who eat diet rich in vegetables, salad, fruit, berries and nuts were associated with decrease risk for preterm labor, especially mothers who were having their first baby. In contrast, pregnant mothers, who eat

nutrients containing a lot of salty snacks, chocolate and sweets, cakes, French fries, white bread, ketchup, sugar sweetened drinks, processed meat products, and pasta had an increased risk for preterm labor.

Also, proposed that a causal link between diet, infectious bacteria and preterm labor, as unhealthy diet induces infectious bacteria in the flora of the gut and vagina, which will then either ascend to the uterus and cervix or is transported through circulation to inflammation and its associated with increased risk for PTL. This finding in the same line with the present study stated that intervention group who follow up nursing care guideline (eat healthy balanced diet rich in vegetables, salad, fruit, berries and nuts) were associated with decrease risk for preterm labor by increasing immunity and resistance to infection which is responsible for occurrence of preterm labor.

**Abd El razek, Ayoub & Farahat ., (2016)** stated that poor sleep quality, in both early and late pregnancy, is associated with an increased risk of preterm labor. So healthcare providers should advice mother during pregnancy to get adequate sleep duration (8 hours of bed time). This finding in the same line with the present study that mentioned that intervention group who follow up nursing care guideline (sleep adequate duration eight hours) were associated with decrease risk for preterm labor as result of relaxation decrease stress which help in reducing preterm labor.

**Martinez-Beneyto, Vera-Delgado & Perez .,(2011)** mentioned that pregnant mothers are more vulnerable to dental caries compared with non-pregnant mothers as dental caries is a frequently encountered oral health problem in pregnancy. Dental caries can lead to inflammation and so increase the risk of preterm labor. This finding in the same line with the present study that mentioned that intervention group who follow up nursing care guideline (dental visit and maintain oral hygiene) were associated with decrease risk for preterm labor. The present study utilizing of nursing care guideline for prevention of preterm labor (psychological support for the women, health education about self care, promotion of health behaviors during pregnancy as good nutrition, avoid unnecessary drugs and negative smoking) were effective in improve signs and symptoms preterm labor, avoid risk factors and bad habits that leading to preterm labor. This findings in the same line with **(Mousa., 2014)** who stated that protocol of care about preterm labor was highly significant in decrease the occurrence of preterm labor and improve signs and symptoms of preterm labor.

## V. Conclusion

Based on the results of the present study the following can be concluded that, it was found that around one third of intervention and control group regarding their age, it was (<18 years) which constituted (28.3%-35.0%) respectively. Concerning educational level and around two third of both groups had body mass index (overweight) (63.3%-70.0%) respectively.

While, women with multigravida were highly distributed percentage among the study group and control group (73.3%-68.3%) respectively. Anemia, vaginal infection and pregnancy induced hypertension were common complains during current pregnancy among both groups. There is more than two third had improvement regarding signs and symptoms of preterm labor of intervention group compared to control group. Life style and behaviors of pregnant women for avoiding preterm labor pre and post utilizing of nursing care guidelines among intervention group were highly statistical significance ( $p < 0.001$ ).

## VI. Recommendations

Based on the results of the present study the following can be recommended:

- Nursing care guidelines for prevention of preterm labor should be used as routine hospital care.
- Raise awareness for important utilizing it among maternity nurses.

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