Determinants of Preterm Births in West and East Wollega Zones Selected Public Hospitals, West Oromia, Ethiopia

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ABSTRACT

Back ground: Preterm birth is major challenge for maternal and prenatal care worldwide and a leading cause of neonatal morbidity and mortality. There are several determinants of preterm birth of which some of them are modifiable.

Objective: To identify determinants of preterm birth among women who give birth in West and East wollega zones selected public hospitals during the study period,2018.

Method: Case-control study was conducted among randomly selected mothers who gave birth in the selected hospitals from March 1 to April 30, 2018 G. Namely; Nekemte referral, Gimbi and Nedjo hospitals. The hospitals were selected by simple random sampling, case were selected consecutively and controls selected using systematic random sampling technique from selected hospital. The final sample size for cases was 90 and controls were 180. Data was collected from the respondents through face to face interviewing and entered into SPSS version 20 for analysis. Odds ratio with their 95% CI and P value was calculated. Variables with P value < 0.25 in bivariate analysis were entered in to multivariate logistic regression analysis. Statistical significance was declared for these variable P value <0.05.

Result: A total of 90 cases and 180 controls were interviewed. Presence of hard work during pregnancy[AOR 4.25, 95% CI= 1.998-9.073], history of preterm birth [AOR 4.8, 95% CI= 2.324-10.037], history of abortion [AOR 3.69, 95% CI= 1.262-10.819], hyper emesis [AOR 4.83, 95% CI= 2.325-10.037], bleeding during pregnancy [AOR 6.96, 95%CI-= 2.217-21.906], urinary tract infection [AOR 3.64, 95% CI= 1.317-10.107], multiple pregnancy [AOR 5.66, 95% CI=1.84-17.419] and pre-eclampsia [AOR 5.41, 95% CI=1.559-18.80] were identified as significant determinants of preterm birth.

Conclusion : There are numerous risk factor identified for preterm birth. Early identification of these risk factor during prenatal care and giving emphasis to these determinants with appropriate care during pregnancy is important to reduce preterm birth. Also, advising mothers on adequate rest during pregnancy, community awareness may reduce the risk of preterm birth.

Key words : preterm birth, determinant factor Introduction.

Preterm birth is defined as delivery prior to 37 completed weeks or 259 days gestation (whether its singleton or multiple)(1). It is further classified into three main categories: moderate to late preterm(32 to <37weeks),very pre term(28 to 32weeks), extremely preterm(less than 28weeks)(2,3).

Preterm is a syndrome with variety of causes which classified in to Spontaneous preterm (spontaneous onset of labor or following pre labor premature rupture of membranes which accounts for 65-70% of all preterm and Provider initiated preterm (induction of labor or elective caesarian section birth before 37 completed weeks of gestation for maternal or fetal indications or other non-medical reasons which accounts for 30-35% of preterm) (1,3).

Preterm birth estimated over 15 million every year and raising, representing a preterm birth rate of 11.1% in the world(1). More than 1 in 10 babies are born preterm, affecting families all around the world. Sub Saharan Africa and south Asia accounts for more than 60% of the world preterm baby. Greater than 80% of preterm birth occur between 32-37 week gestation and Most of these babies can survive with essential new born care. Greater than 75% death of preterm can be prevented without intensive care (1, 2).

Globally, prematurity is the leading cause of death in children under five years of age. Almost in all country preterm birth is increasing. In low income country, half of these babies born at 32 weeks die due to lack of feasible, cost effective care such as warmth, breast feeding support and basic care for infection and breathing difficulties. In high income country all most all of these baby survive (1, 2,3).

New born death contributes to 42% of under 5 mortality. Preterm babies are more vulnerable and at risk of death and disability within minute of birth. Preterm birth is the leading cause of new born mortality globally as well as in Ethiopia (1, 4).

According to United nation of children found report, preterm birth accounts 23% of all other cause of neonatal death in Ethiopia(2). Also, Ethiopia Demographic and health survey in 2011 shows preterm birth is a major and direct cause of neonatal mortality.

METHODS AND MATERIALS

Study area and study period

This study was conducted at obstetric and gynecologic department of the three selected public hospital of East and West wollega zone of Oromia Regional state. There are four public hospitals (Nekemte Referral, Gida Ayana, Arjo hospitals and wollega university teaching and referral hospital). There are four government hospitals (Gimbi, Nedjo, Begi and Mana sibu hospitals)in West wollega zone. From Eight governmental hospitals, three hospital (Nekemte referral, Gimbi and Nedjo public hospital) were selected by simple random sampling. The followings are the three selected hospitals in which the study was conducted.

This study was conducted from March 1, 2018 to April 30, 2018.

Study design

Case control study was carried out to assess factor associated with preterm birth at selected public hospitals.

Source population

Source population for case :- All mothers who gave preterm birth in East and West wollega zone hospital.

Source population for control :- All mother who gave term birth at East and West wollega zone hospital.

Study population Study population for cases :-All mothers who gave birth to preterm baby in the selected West and East wollega zones hospital, West Oromia, during the study period.

Study population for control :- All mothers who gave birth to term babies in the selected West and East wollega zones hospital, West Oromia, during the study period.

Study unit/sample

The study subject for cases was a mother who gave live preterm baby/ babies at selected hospital during the study period while for control was a mother who gave birth to term baby in selected hospital during the study period from March 1 to April 30, 2018.

Inclusion and exclusion criteria

Inclusion criteria for cases :-All mothers who gave live preterm babies in the selected public hospitals during the study period.

Exclusion criteria :-Those women who was seriously ill to communicate with during the study period

Inclusion criteria for controls :-All women who gave birth to term baby in the selected public hospital during the study period

Sample size determination

The sample size was determined using two population proportion formula using stat calc EPI info 7.1.1 to estimate the sample size required for the study.

RESULTS

SOCIO- DEMOGRAPHIC CHARACTERISTICS OF STUDY PARTICIPANTS

In this study, out of the total 270 study participants gave their response making a response rate of 100%. Among the respondents, 90 (100%) were mothers who gave preterm birth and 180(100%) were mothers who gave term birth. All of the participants were women who gave birth interviewed within 72 hours of delivery. The mean age of respondents for control was 26.26± 4.41 years in the study and for cases was 26.08 ± 4.28 years; and majority of the respondents, 167(92.8%) of controls and 84(93.3%) of cases were between the age of 19-34 years. Among all participants, 53(58.9%) of cases were rural and 85(47.2%) of controls were rural residents respectively. Regarding ethnicity 82(91.1%) of cases and 153 (85.0%) of controls were Oromo. From all participants, 129 (71.6%) of controls and 69(76.4%) of cases were protestant followers in religion. The majority of 175(97.2%) of controls and 87 (96.7%) of cases were married. Among the participants 59(32.8%) of controls and 31 (34.4%0 of cases were farmers. Of all respondents 30(34.1%) of cases and 56(31.8%) of controls were their monthly income below five hundred(table 1).

Table 1: Socio-Demographic characteristics of respondents distribution at selected west and east wollega zone selected hospital, west Oromia, Ethiopia, 2018

Variables	Participants	
	Cases (90) No (%)	Controls(180)No(%)
Age of participants at current pregnancy		
≤18	3(3.3)	3(3.3)
19-34	84(93.3)	167(92.8)
≤35andabove	3(3.3)	10(5.6)
Residence		
Urban	37(41.1)	95 (52.8)
Rural	53(58.9)	85(61.6)
Ethnic back ground		
Oromo	82(91.1)	153 (85.0)
Amhara	8(8.9)	27(15.0)
Religion		
Protestant	69(76.4)	129(71.6)
Orthodox	21(23.4)	51(28.4)
Marital status		
Currently Married	87(96.7)	175(97.2)
Currently Un married	3(3.3)	5(2.7)
Educational status		
can`t read and write	20(22.2)	35(19.4)
Primary school	42(46.7)	52(28.9)
Secondary schools	17(18.9)	54(30.0)
College and above	11(12.2)	39(21.7)
Occupation		
Farmer	31(34.4)	59(32.8)
Govt/NGO employ	14(15.6)	41(22.8)
Merchant	9(10.0)	27(15.0)
House wife	25(27.8)	40(22.2)
Daily laborers/others	11(12.2)	13(7.2)
Estimated monthly family income		
Less than 500	30(34.1)	56(31.8)
501-1000	20(38.5)	32(18.2)
1001-1500	13(22.7)	37(21.0)
1501-2000	14(15.9)	28(15.9)
Above 2000	11(2.5)	23(13.1)

OBSTATERIC RELATED CHARACTERSTICS OF THE STUDY PARTICEPANTS

Fifty 50(35.2%) of cases and 92(64.8%) of the controls have parity of 2-4, 35 (31%) of cases and 78 (69%) of controls were Premi para. Among the total participants 10(11.1%) of cases and 14(7.8%) of controls have history of still birth. From the total respondents 15(16.7%) of cases and 8 (4.4%) of controls had history preterm birth, 20(22.2%) of cases and 12(6.7%) of controls had history abortion. Majority of the respondents 169 (93.6 %)of controls and 86(95.6 %) of cases had antenatal care follow up during their current pregnancy, 57(63.3%) of cases and 39 (21.7%) of controls had history of hyper emeses gravidrum during the index pregnancy (Table 2).

Table 2: Obstetrics history of respondents distribution at selected west and East wollega zonal hospital, west Oromia regional state , Ethiopia,2018

	Participants	
	Case(90)	Control(180)
	No (%)	No (%)
History of preterm birth		
Yes	15(16.7)	8(4.4)
No	75(83.3)	172(95.6)
History of abortion		
Yes	20(22.2)	12(6.7)
No	70(77.8)	168(93.3)
How many times you have follow up antenatal care ?		
None	3(3.3)	8(4.5)
Three and less	58(64.4)	106(55.2)
Four and above	29(32.2)	65(36.3)
Gestational hypertension		
Yes	24(26.7)	20(11.1)
No	66(73.3)	160(88,9)
History of hyper emesis gravid rum during current pregnancy		
Yes	57(63.3)	39(21.7)
No	33(36.7)	141(78.3)
Age of gestation in week at delivery		
29-32week	43(47.8)	-
33-37week	47(52.2)	-

37-42wek	-	179(99.4)
Above 42 week	-	1(0.6)
Type of birth		
Multiple	15(16.7)	10(5.6)
Single	75(83.3)	170(94.4)
Pregnancy status		
Planned and wanted	67(74.4)	155(86.1)
Un planned	23(25.6)	25(13.9)
History of vaginal bleeding during current pregnancy		
Yes	19(21.1)	9(5.0)
No	71(78.9)	171(95.0)
History of premature rupture of membrane		
Yes	18(20.0)	20(11.1)
No	72(80.0)	160(88.9)

MATERNAL MEDICAL AND BEHAVIORAL RELATED CHARACTERSTICS OF THE STUDY PARTICEPANTS

Of the total respondents,14(15%) of the cases and 22(12.2%) of controls reported having history of hospitalization during their current pregnancy. Among the total respondent,23(25.0%)of cases and 14(7.8%) of controls reported urinary tract infection during their current pregnancy. Majority of the respondents 83(92.2%) of cases and all of the controls did not have diabetes mellitus disease, 82(91.1%) of cases and 175(97.2%) of controls reported no history of asthmatic disease. Among the total respondents 15(16.7%) of cases and 9(5.0%) of controls were develop preeclampsia during their current pregnancy, 175(97.2) of control and82(91.1) of case of participants had no history of asthma. Of the total respondents, 13(14.4%) of the cases and 9(5.0%) of controls reported as having history of domestic or spouse abuse during their current pregnancy. Most of respondents 59(65.6) of cases and 39(21.7) of controls reported as they had history of involved in hard work during this pregnancy (Table 3).

Table 3: Maternal medical and behavioral related characteristics of respondents distribution at selected west and East wollega zonal hospital, west Oromia regional state, Ethiopia, March 01-April 30,2018

Variables	Participants	
	Case(90) NO (%)	Control (180) NO (%)
History of hospitalization during current pregnancy		
Yes	14(15.6)	22(12.2)
No	76(84.4)	158(87.8)
History of UTI during current pregnancy		
Yes	23(25.0)	14(7.8)
No	67(74.4)	166(92.2)
History of DM		
Yes	7(7.8)	0(0.0%0
No	83(92.2)	180(100)
History of asthma		
Yes	8(8.9)	5(2.8)
No	82(91.1%)	175(97.2)
History of chronic hypertension		
Yes	10(11.1)	11(6.1)
No	80(88.9)	169(93.9)
History of pre-eclampsia in current pregnancy		
Yes	15(16.7)	9(5.0)
No	75(83.3)	171(95.0)
HIV status		
Positive	1(1.1)	0(0.0)
Negative	76(84.4)	173(96.1)
Unknown	13(14.4)	7(3.9)
Hgb level		
<11	36(40.4)	51(28.8)
11 and above	53(59.6)	126(71.2)
Domestic or spouse abuse during current pregnancy		
Yes	13(14.4)	9(5.0)
No	77(85.6)	171(95.0)
Substance abuse		
yes	7(7.8)	6(3.3)
No	833(92.2)	174(96.7)
Hard work during current pregnancy		
yes	59(65.6)	39(21.7)
No	31(34.4)	141(78.3)

CHARACTERSTICS OF THE NEONATE

Most of the neonates 48(53.3%) of male neonate were born preterm among cases and 99(55.0%) of male neonate were born at term among controls.

Bivariate analysis

In this study descriptive statistics was computed as presented in the above tables (table 1 up to table 3) to assess the frequency distribution. To identify candidate variable for the base of comparison, the strength of association between each variable and dependent variable was examined through bivariate analysis, by computing odds ratio at 95% confidence interval and assumption of p-value less 0.25 was significant to have more candidate variable.

The result of bivariate logistic regression of socio demographic characteristics shows that only educational status COR=2.86(1.3-6.26) were found to be candidate variable for determinants of preterm birth . From this study, Bivariate analysis behavioral related factor shows that domestic spouse abuse COR=3.208(1.315-7.825) and those mothers who had participating in hard work COR=6.881(3.926-12.059) were candidate variable that have an association with preterm birth.(table 4).

Table 4:- Bivariate Analysis of socio-demographic and behavioral related characteristics that determine determinants of preterm birth among the study participants at selected west and east wollega zones hospitals, Oromia hospitals, March 01- April 30, 2018.

Variable	Participants		COR(CI 95%)	P-value
	Cases No (%)	Controls No (%)		
Residence of the respondent				
Urban	37(28.0)	95 (72.0)	0.0625(0.374-1.042)	0.625
Rural	53(38.4)	85(61.6)	1.00	
Educational status				
Can`t read and write	20(36.4)	35(63.6)	2.026(0.0852-4.815)	0.110
Primary school	42(44.7)	52(30.0)	2.864(1.309-6.266)	0.008
Secondary school	17(23.9)	54(76.1)	1.116(0.471-2.646)	0.083
College and above	11(22.0)	39(78.0)	1.00*	

Occupation				
Farmer	31(34.4)	59(68.6)	0.621(0.249-1.547)	0.306
Employee	14(25.5)	41(74.5)	0.404(0.148-1.104)	0.077
Merchant	9(25.0)	27(75.0)	0.394(0.131-1.186)	0.097
House wife	25(38.5)	40(61.5)	0.739(0.287-1.902)	0.537
Daily laborer	11(45.8)	13(54.2)	1.00	
Substance abuse				
Yes	7(53.8)	6(46.20	2.446(0.797-7.506)	0.118
No	83(32.3)	174(67.7)	1.00	
Domestic /spouse abuse				
Yes	13(59.1)	9(40.9)	3.208(1.315-7.825)	0.010*
No	77(31)	171(69)	1.00	
Hard work				
Yes	59(60.2)	39(39.8)	6.881(3.926-12.059)	0.000*
No	31(18)	141(82)	1.00	

From this study,Bivarite analysis obstetric related characteristics shows that among participants who had history of preterm birth COR=4.3(1.748-10.575), history of abortion COR=4(1.856-8.622), history of hyper emesis COR=6.245(3.580-10.8930), history of pregnancy induced hypertension during current pregnancy COR=2.909(1.505-5.823), plurality COR=3.4(1.460-7.915),bleeding during current pregnancy COR=5.085(2.195-11.777), urinary tract infection, preeclampsia were found to be candidate variable significantly determinants of preterm birth. several factors like , pregnancy status , parity, history of still birth, history of hospitalization during current pregnancy, hemoglobin level were no significance difference between cases and controls (table 5).

Table 5:- Bivariate Analysis of obstetric related characteristics that determine determinants of preterm birth among the study participants of west and East wollega zones selected hospital, west Oromia hospitals, March 01- April 30, 2018.

Variable	Participants		COR	P-value
Parity	Cases no(%)	Controls no(%)		
Premi para	35(31.0)	78(69.0)	0.897(0.286-2.821)	0.853
2-4	50(35.2)	92(64.8)	1.087(0.352-3.356)	0.885
5 and above	5(33.3%)	10 (67.7%)	1.00	
History of still birth				
Yes	10(58.3)	14 (41.7)	1.482(0.631-3.482)	0.367
No	80(32.5)	166(67.5)	1.00	
History of preterm birth				
Yes	15(65.2)	8(34.8)	4.300(1.748-10.575)	0.001*
No	75(30.4)	172(69.6)	1.00	
History of abortion				
Yes	20(22.2)	12(6.7)	4(1.856-8.622)	0.000*
No	70(77.8)	168(93.3)	1.00	
History of hyper emesis gravid rum during current pregnancy				
Yes	57(63.3)	39(21.7)	6.242(3.580-10.8930	0.000*
No	33(36.7)	141(78.3)	1.00	
History gestational hypertension				
Yes	24(26.7)	20(11.1)	2.909(1.505-5.823)	0.001*
No	66(73.3)	160(88.9)	1.00	
Type of birth				
Multiple	15(16.7)	10(10.6)	3.4(1.460-7.915)	0.005*
Single	75(83.3)	170(94.4)	1.00	
Current pregnancy status				
Planned and wanted	67(30.2)	155(69.8)	0.470(0.249-0.886)	0.020

Un planned	23(47.9)	25(52.1)	1.00	
History of vaginal bleeding during current pregnancy				
Yes	19(21.1)	9(5.0)	5.085(2.195-11.777)	0.000*
No	71(78.9)	171(95.0)	1.00	
History of premature rupture of membrane				
Yes	18(20.0)	20(11.1)	2(0.998-4.007)	0.051
No	72(80.0)	160(88.9)	1.00	
History of pre-eclampsia during current pregnancy				
Yes	15(16.7)	9(5.0)	3.8(1.592-9.069)	0.003*
No	75(83.3)	171(95.0)	1.00	

From this study, Bivariate analysis of maternal medical condition characters shows that those mother who had history of urinary tract infection during current pregnancy COR=4.070(1.976-8.383) and history of chronic hypertension COR=1.920(1.73-4.708) were candidate variable for determinants of preterm birth than those mothers who had no history o urinary tract infection and chronic hypertension(Table 6).

Table 6 :- Bivariate Analysis of maternal medical condition characteristics factor associated with preterm birth among the study participants of west and East wollega zones selected hospital, west Oromia hospitals, March 01-April 30, 2018.

Variable	Participants		COR	P-value
	Cases No (%)	Controls No(%)		
History of urinary tract infection during current pregnancy				
Yes	23(25.6)	14(7.8)	4.070(1.976-8.384)	0.000*
No	67(74.4)	166(92.2)	1.00	
History of chronic hypertension medical disorder				
Yes	10(11,1)	11(6.1)	1.920(1.783-4.708	0.004*
No	80(88.9)	169(93.9)	1.00	
Hemoglobin level				
<	36(41.4)	51(58.6)	1.678(0.984-2.862)	0.057
≥	53(29.6)	126(70.4)	1	
History of asthma				
Yes	8(8.9)	5(2.8)	3.415(1.084-10.760)	0.036*
No	82(91.1)	175(97.2)	1.00	
History of hospitalization during current pregnancy				
Yes	14(15.6)	22(12.2)	1.920(0.642-2.728)	0.449
No	76(84.4)	158(87.8)	1.00	

MULTIVARIATE LOGISTIC REGRESSION OF FACTOR ASSOCIATED WITH PRETERM BIRTH.

All variables with a p- value <0.25 in bivariate logistic regression analysis were entered in to multivariate logistic regression analysis model to control possible confounders. When analyzed with multivariable logistic regression by computing adjusted odds ratio with 95% Confidence Interval and assuming P value <0.05 was considered statistically significant.

The result of the study showed that a pregnant women who were engaged in hard work were four times more likely to gave preterm birth than those who did not involve in hard work (AOR=4.25, 95% CI=1.998-9.073). Women who were previously experienced abortion three times more likely to give preterm birth than those who did not

experience (AOR=3.696, 95% CI=1.262-10.819) . Those women who had history of hyper emesis were four times (AOR=4.83, 95% CI= 2.324-10.037) more likely to give preterm birth, history of bleeding during this current pregnancy (APH) were six times (AOR=6.968, 95%CI= 2.217-21.90) more likely to give preterm, mothers with history of urinary tract infection (UTI) during current pregnancy were three times more likely to give preterm birth than those who do not have history of urinary tract infection(AOR=3.648,95% CI=1.31-10.10) and mothers who reported history of pre eclampsia were five times more likely to give preterm birth as compared to those who did not have history preeclampsia(AOR=5.414,95% CI=1.55-188). In this study history of chronic hypertension was found to be determinants of preterm birth. Mother who had history of chronic hypertension 4.9 times more likely to have preterm birth in next pregnancy than mothers without history of chronic hypertension (AOR=4.99, 95% CI=(1.282-18.897). Mother who had multiple pregnancies was another determinant of preterm birth. Mother who had multiple pregnancy five times more likely to have preterm birth (AOR=5.66, 95% CI=1.845-17.419) and mother who had history pregnancy induced hypertension during current pregnancy 1.5 times more likely to have preterm birth than those mother who hadn`t history of pregnancy induced hypertension(Table 7).

Table 7 : Multivariate analysis for determinants of preterm birth at selected west Oromia hospital, Ethiopia, March 01-April 30,2018

Characteristics	participants		COR (CI 95%)	AOR (CI 95%)
	case n(%)	Control n(%)		
Hard physical work during pregnancy				
Yes	59(65.6)	39(21.7)	6.881(3.926-12.059)	4.25(1.99-9.073)
No	31 (34.4)	141(78.3)	1	1
History of preterm				
yes	15(16.7)	8(4.4)	4.300(1.748-10.575)	6.73(1.549-29.303
No	75(83.3)	172(95.6)	1	1
History of abortion				
Yes	20(22.2)	12(6.7)	4(1.856-8.622)	3.66(1.262-10.819)
No	70(77.8)	168(93.8)	1	1
History of hyper emesis gravidrum				
Yes	57(63.3)	39(21.7)	6.245(3.580-10.893	4,83(2.32-10.037)
No	33(36.7)	141(78.3)	1	1

Vaginal bleeding during pregnancy				
Yes	19(21.1)	9(5.0)	5.085(2.195-11.777)	6.96(2.21-21.90)
No	71(78.9)	171(95.0)	1	1
History of UTI				
Yes	23(25.6)	14(7.8)	4.070(1.976-8.383)	3.648(1.31-10.10)
No	67(74.4)	166(92.2)	1	1
History of pre eclampsia				
Yes	15(16.7)	9(5.0)	3.800(1.592-9.069)	5.414(1.55-18.8)
No	75(83.3)	171(95.0)	1	1
Gestational hypertension				
yes	24(26.7)	20(11.1)	2.909(1.505-5.623)	1.50(1.385-2.91)
No	66(73.3)	160(88.9)	1	1
Plurality				
yes	15(16.7)	10(5.6)	3.400(1.460-7.9150	5.66(1.84-17.419)
no	75(83.3)	170(94.4)	1	1
Educational status				
Cannot read and write	20(22.2)	35(19.4)	2.026(0.0852-4.815)	0.155(0.021-1.141)
Primary school	42(46.7)	52(28.9)	2.864(1.309-6.266)	1.442(0.474-4.389)
Secondary school	17(18.9)	54(30)	1.116(0.471-2.646)	0.709(0.219-2.307)
College and above	11(12.2)	39(21.7)	1	1
Chronic hypertension				
Yes	10(11.1)	11(6.1)	4.070(1.976-8.384)	4.02(1.282-18.897)
No	80(88.9)	169(93.9)	1	1
History of asthma				
Yes	8(8.9)	5(2.8)	3.45(1.084-10.076)	1.6(0.832-13.342)
No	82(91.1)	175(97.2)	1	1

DISCUSSION

The present study was designed to investigate determinants of preterm birth in East and West wollega zones selected hospitals namely Nekemte referral hospital, Gimbi and Nedjo public hospital, West Oromia during the study period.

The study revealed that those women who experienced vaginal bleeding (APH) during the current pregnancy was identified as strong contributing factor for preterm birth. This finding is similar with a study conducted in Ardabil Iran reported that women who have history of vaginal bleeding were more likely to have of preterm birth (21) and other similar study in rural area of west china also reported that placenta Previa is one of the factors associated preterm birth (15). Similarly, other study in Tehran, Iran, Deberamarkos town Health Institution and Jimma University reported that bleeding during pregnancy is one of the determinant factors of preterm birth (17,19,20). The reason for vaginal bleeding in the second and third trimester may be due to placenta Previa and abruptio. That needs hospitalization and an indication of induced preterm birth.

In the current study, mother's who experienced hard working during current pregnancy are likely to give birth to preterm baby. This finding is consistent with a study done in Ardabil, Iran, and northern Eastern Tanzania(21,14). But this study is inconsistent with study conducted at Jimma, Ethiopia reported that hard working during current pregnancy is not significant risk factor for premature birth (19).this may be due to difference in study area. This could be stress of working during pregnancy increase hormonal level that put a women at greater risk of PTB and other complication.

In this study, mothers with the history of hyper emesis gravidrum during the current pregnancy were four times more likely to have preterm birth as compared to the controls. Similar to our finding, a study conducted at Ardabil, Iran and meta analysis conducted in Poland reported that the risk of prematurity to increase 1.3 times in women who suffered from hyper emesis gravid arum (21, 27). This finding is in consistent with a study conducted at Jimma, Ethiopia reported that hyperemesis gravidrum is not significant risk factor for premature birth (19). This difference may be due to methodological and study area difference. A mother with Prolonged hyperemesis gravidrum are at risk of dehydration and electrolyte imbalance that needs hospitalization. If left untreated it is at greater risk of preterm labour, preeclampsia and Long-term complications to the baby may occur.

In this study, having history of preeclampsia was found to be risk factor for preterm birth. Mothers who had history of preeclampsia during the current pregnancy had an increased probability of having preterm birth than those mothers without a history of preeclampsia. This finding is in line with a study conducted in Ardabil, Iran (21). And similar study done in India teaching hospital reported that preeclampsia was significant factor for preterm birth(24). This is supported by other study and systematic review conducted at west china reported that pre eclampsia was determinant factor for preterm birth(28). And also supported by a study conducted in Tehran, Iran (20). This might be because of preeclampsia can affect all the organ of the body that may cause serious health problem for the mother and the baby if not treated. Therefore, early delivery is needed to prevent potential life threatening complication.

Mothers having history of previous preterm birth was identified as risk factor for preterm birth. This study is similar with finding in Peru that reported having history of preterm birth was four times more likely to increase a risk for

preterm birth (16). In similar way study in rural area of western china, Tehran Iran and India teaching hospital and meta analysis study conducted in Poland showed that having history of previous preterm delivery increase risk of the next pregnancy become ended with preterm birth (15,20 24,18). Also, this is supported by a study conducted at Jimma, Ethiopia (19). The mechanism for this could be spontaneous labor as well as those with inducing preterm birth is rising.

This study showed having previous experience of abortion was another significant risk factor of preterm birth. Those mothers who had history of previous abortion had three times increased risk of having preterm birth than those mothers without preterm birth. This study is similar with study conducted at Jimma, Ethiopia that reported Women who weren't previously experienced of abortion (P=<0.001, OR=0.282, 95%CI: (0.14-0.565)) were 71.8% were less likely had preterm birth as compared to mothers who had previous history of abortion(19), This finding is in line with a study conducted in North Sudan that report induce and spontaneous abortion associated with increased odd ratio for preterm birth in subsequent pregnancy(22). The fact that abortion increase the risk of preterm birth is that evacuation of the uterus mechanically stretches the cervix which predisposes such mothers to preterm birth in the consecutive pregnancies.

In this study, infection of urinary system was identified as another significant risk factor of preterm birth. This finding is similar with a study in Dar es Salaam, Tanzania and India that genitourinary tract infection is significantly higher among women who give preterm birth (14,24). Also, this finding is in line with other study conducted in Tehran, Iran and Jimma, Ethiopia(19,20). Also, this finding is in line with other study conducted in Jimma, Ethiopia, Similar to my results, urinary system infection as a risk factor for premature birth(19). Most of UTI are bladder infection and are not serious if they are treated at right way. If left untreated, a bladder infection may travel to the kidney and can cause variety of complication including preterm labour, low birth weight and sepsis. Early diagnosis followed by immediate therapy is essential during pregnancy to avoid adverse maternal and neonatal health outcomes.

This study reported that chronic hypertension is other significant factor that increase the risk of preterm birth. This finding is consistence with meta analysis study conducted in Poland showed that Hypertension important risk factor associated with preterm birth(18). Also, this finding similar with other study conducted in northern Tanzania that reported women who had chronic hypertension were more likely to have preterm delivery(30). our study is similar with study conducted in Deberamarkos, Ethiopia, that shows these mothers who had chronic disease about 4.5 times higher risk of having preterm birth than mothers without chronic illnesses (17). this may be due to hypertension lowered the utero placental perfusion by contracting the plasma volume that reduce transfer of oxygen and nutrients to the development of fetus, and may result in preterm delivery and low birth weight.

In this study we found that mothers with multiple pregnancies had more 5.6 folds increasing likelihood of having preterm delivery as compared to mothers with singleton birth. Similar to this finding, study conducted in Poland reported that multiple pregnancy is significant risk factor of preterm birth(18). Another in line study to our finding

that conducted in northern Tanzania reported that multiple pregnancy had more than two times increase the likely hood of having preterm birth as compared to mother had singleton birth(30). The mechanism of early completion of pregnancy is related to excessive uterus stretching.

In this study, pregnancy induced hypertension identified as significant risk factor for preterm birth. Those mother who had pregnancy induced hypertension during current pregnancy had 1.5 times increased risk of having preterm birth than those mothers without pregnancy induced hypertension. This finding is similar with a study conducted in north Tanzania, Sudan (14,22)and Gonder and Jimma, Ethiopia (19, 23).This may due to high blood pressure during pregnancy may affect the mothers blood vessels, including the blood vessels in the umbilical cord that leads to tighten these blood vessels that makes more difficult for the baby to get more oxygen and nutrients to grow. And this may result in preterm delivery and low birth weight.

In this study, substance abuse is not significant risk factor for preterm birth. This could be due to those study participants were not substance abuse during the study period.

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