Preterm birth and associated factors among mother who gave birth in public health hospitals in harar town eastern Ethiopia.

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Abstract

Background: Preterm birth is defined as a delivery which occurs at less than 37 weeks completed of gestation. The majority of preterm birth remains vulnerable to long term complications that may persist all over their lives. Globally, about 12.9 million births (9.6%) of all births worldwide were preterm and of these more than 60% of preterm births occur in Africa and South Asia while about 0.5 million were in each of Europe and North America. There is limited evidence on magnitude of preterm birth and associated factors, among women attending delivery service at public hospitals of low income countries like Ethiopia including the study setting, Harar town.

Objective: To assess magnitude of Preterm Birth and Associated Factors among Mother Who Gave Birth in Public Health Hospitals in Harar Town Eastern Ethiopia.

Methods and Material: Institutional based cross-sectional study was conducted on 325 women attending delivery service in Harar public hospitals. Structured questionnaires were used to collect data; systematic sampling technique also used to select participants. A total of three data collectors and one supervisor were participated on the study. The data was entered to SPSS version 22.0 for analysis. Pretest, double data entry and local language translation are used to assure data quality. The descriptive and logistic analysis was employed. To measure the strength of association between dependent and independent variables, Crude and Adjusted Odd Ratios with 95% Confidence interval was calculated. Finally, the variable which shows p-value<0.05 considered as statistically significance.

Result: The study show that the magnitude of preterm birth was 24.9% (95%CI 21.0, 29.8). Women who didn't attend ANC (AOR=1.5, 95% CI: 0.7, 2.3), history of ante partum hemorrhage (AOR=1.3, 95% CI: 0.2, 2.7), hemoglobin less than eleven (AOR=1.4, 95% CI: 0.2, 2.2) and birth interval less than 24 months (AOR=1.3, 95% CI: 0.4, 2.3) and history of chronic disease (AOR=1.3, 95% CI: 0.4, 2.3) were significantly associated with outcome variable.

Conclusion and Recommendation: The prevalence of preterm birth in Harar town public health hospitals is slightly higher than studies done in different parts of Ethiopia. Not attending ANC, short inter pregnancy interval (<24 months), previous history of APH, Presence of chronic medical illness and low hemoglobin level (<11g/dl) were found to be statistically significant with the occurrence of preterm birth in current pregnancy therefore effort need to improve on it.

Keywords: Laboring mother, Preterm birth, Public hospital, Harar town.

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Introduction

Preterm birth is defined by WHO as all viable births before 37 completed weeks of gestation or fewer than 259 days since the first day of woman's last menstrual period. It is classified as extremely preterm <28 weeks, very preterm 28 to <32 weeks, and moderate preterm 32 to <37 weeks can also be spontaneous or provider initiated (induced).

Globally, about 12.9 million births (9.6%) of all births worldwide were preterm and of these more than 60% of preterm births occur in Africa and South Asia while about 0.5 million were in each of Europe and North America and 0.9 million in Latin America and the Caribbean.

The rate of preterm birth is escalating globally and ranges from 5 to 7% in developed countries and significantly higher in least developed countries. Prematurity is one of the leading causes of neonatal deaths in Africa (11.9%) and is a major public health problem and it is responsible for 27% of all early neonatal admission [1]. According to the report from "white paper on preterm birth" in 2011, of all 4 million annual early neonatal deaths 28% are due to preterm birth. Preterm birth has many long and short term consequences like cerebral palsy, mental retardation, visual and hearing impairments, behavior and social-emotional concerns, learning difficulties, and poor health and growth, neurosensory deficits (blindness, deafness), intra ventricular hemorrhage, necrotizing enter colitis, and delay in physical and mental development. The major risk factor of preterm delivery was absence or inadequate prenatal care, low monthly income, no contraceptive use, cesarean delivery, and clinical complications during pregnancy. There is limited information on magnitude of preterm birth and associated factor among women attending delivery service at public hospitals of Harar Town therefore this study aimed to contribute in identifying magnitude and factors associated with preterm birth.

Significance of the study

The result of this study provides valuable information on magnitude of preterm birth and associated factors. Determining factors has a great role in guiding health professionals and health policy makers to design the intervention strategy and applying necessary preventive and appropriate measures to decrease preterm birth and new born mortality and morbidity. In addition, it will help to fill the research gaps in the study area and serve as base line information for other researcher [2].

Methods and Materials

Study area and period

Institutional based cross sectional study was conducted among mother who gave birth in Harar Town public health institution. Harar is located in the eastern part of Ethiopia 525 Km away from Addis Ababa, the capital city of Ethiopia. In the region, 27 health posts, 8 health centers and 2 Public, 2 Private, 1 Federal Police, 1 Fistula Hospitals, 18 Private for profit clinics, 25 pharmaceutical retails out let, 3 pharmaceutical whole sellers and 2 modern laboratories are available. The study was conducted in 2 public hospital specialized university hospital [3].

Study design

Quantitative Institutional based cross sectional study was utilized.

Source and study population

The source of population was mothers who gave birth in Harar town public hospitals and the study population were randomly selected mother who gave birth during the study period.

Inclusion and exclusion criteria

Women who gave births during the study period with known LNMP or had ultrasound check up result during pregnancy were include on this study while. A woman who doesn't have consent, Women who are unable to communicate was excluded [4].

Sample size determination

Sample size was determined by using single population proportion formula (Proportion of preterm birth from study conducted were 25.9% Calculated sample size=295 by adding 10% non-response rate the final Sample was =325 and double population proportion formula (P1=23.46% and P2=9.64%, 95%, margin of error of 5% and power of 80%, and using Open Epi Info) Calculated sample size =254 by adding 10% non-response rate the final Sample was =279 then comparing the first and second objective, the final sample size was 325.

Sampling procedure

Two governmental public hospital were include sample was proportionally allocated based on their patient flow. Average monthly patient flows in two hospitals were 402 and 180 at HFSUH and Jegula Hospital [5]. Sampling frame was developed from delivery registration book and subjects were selected by using systematic random sampling method. Finally a total of 325 participants were selected based on their allocation until desired sample size was meet.

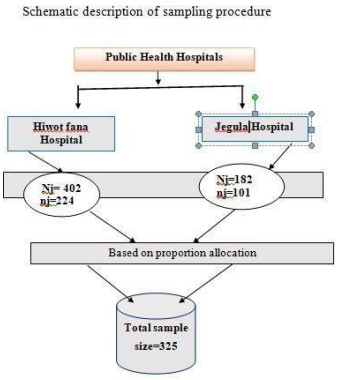

Figure 1. *Schematic description of sampling procedure of research conduct on magnitude of preterm birth and associated factors among pregnant women attending delivery service in public hospitals of harar town.*

Variables of the study

Data collection tools and procedure

The interviewer administered questionnaire was adopted after reviewing relevant scientific literatures. The tool were translated into local language Afan Oromo and translated back to English language to check its consistency, questionnaire contains socio demographic, obstetrics, health care service utilization and medical related factors. Data were collected by three diplomas and one BSc Midwives.

Data quality control

To assure the quality of the data, properly design data collection instrument was developed and pretest was conducted. Training was given for data collectors and supervisors for three days on the instruments, method of data collection, ethical issues and purpose of the study. Completeness and correctness of data was checked on daily based [6].

Data processing and analysis

Data entry was done by using Epi-info 3.1 and transferred to SPSS version 21 for analysis. The univariate analysis such as proportions, percentages frequency distributions and appropriate graphic presentations as well as measures of central tendency and measures of dispersion were made. Inferential statistics were used to establish associations between prematurity and the various risk factors using a chi-square analysis [7]. Multivariate logistic regression was used to determine the factors independently associated with preterm birth. In binary logistic regression analysis with $p \leq 0.25$ were transferred to multivariate logistic regression analysis. In

multivariable logistic regression analysis, the variables with P-value ≤ 0.05 were considered as significantly associated variable with preterm birth.

Ethical clearance

Ethical clearance letter was obtained from Harar health Science College Ethical Review Committee. Permission was obtained from study institution. All the participants were informed the purpose, advantages and disadvantages, there have the right to be involved or not. Consent was obtained from each respondent prior to data collection; Confidentiality was maintained by avoiding names and other personal identification [8].

Results

Socio-demographic characteristics

A total of 325 mothers were included on the study which makes the response rate 100%. The mean age of the study participants was 27.02 with ± 5.73 SD. Majority, 200(61.5%) of the study participants were between 20 and 30 years old. Regarding ethnicity majority 161(49.5%) of the respondent are Oromo 158(48.6%) and Muslim religion flowers (Table 1).

Table 1. *Socio-demographic characteristics of women who give birth in public hospitals in harar town, eastern Ethiopia.*

Variable	Category	Frequency	Percentage
Age	< 20years	19	5.8
	21-30 years	200	61.5
	31- 40 years	106	32.7
Residency	Urban	146	44.9
	Rural	179	55.1
Religion	Muslim	158	48.6
	Orthodox	107	32.6
	Protestant	60	18.5
Ethnicity	Oromo	161	49.5
	Amhara	106	32.6
	Harari	35	10.8
	Tigray	15	4.6
	Somali	8	2.5
Education of mother	Can't read and write	101	31.7
	Can read and write	110	33.8
	Primary level	90	27.7
	Secondary and above	25	0.8
Occupation of mother	Government	128	39.4
	Private	115	35.4
	Merchant	82	25.2

Obstetric related characteristics

Majority of the respondent 227(69.8%) were multigravida women. Regarding birth interval 164(72.2%) women had less than two years birth interval. Spontaneous vaginal delivery accounts the highest 240(73.8%) mode of delivery. Nearly one third 99(30.5%) of women had history of abortion. while more than half 180(55.4%) of the pregnancy were planned. Majority women 282(86.8%) labour had start spontaneously and they had no 250(76.9%) history of Liquid drainage before labor.

Table 2. Obstetrics related characteristics of women who give birth in public hospitals in harar town, eastern Ethiopia.

Variable	Category	Frequency	Percentage
Ever give birth	Yes	227	69.8
	No	98	30.2
Inter birth interval	≤ 2 years	164	72.2
	3-5 years	56	24.7
	> 5 years	7	3.1
Current mode of delivery	SVD	240	73.8
	C/S	70	21.5
	Instrumental	15	4.7
Pregnancy outcome	Single tone	243	74.8
	Multiple	82	25.2
History of preterm	Yes	85	26.8
	No	240	73.8
History of abortion	Yes	99	30.5
	No	226	69.5
Pregnancy type	Planned	180	55.4
	Unplanned	145	44.6
Labor onset	Spontaneous	282	86.8
	Induced	43	13.2
Liquid drainage before labor	Yes	75	23.1
	No	250	76.9
History of PIH	Yes	75	23.1
	No	250	76.9
History of APH	Yes	84	25.4
	No	241	74.2
Any injury during current pregnancy	Yes	50	15.4

	No	275	84.6

Health care service related characteristics

Out of 325 mothers, 240(73.8%) had ANC follow up for their recent pregnancy whereas about 85(26.2%) of them had no ANC follow up. Among those mothers who had ANC follow 22(6.8%) of them had at least one visit while 180(55.4%) had 2 times visited and 38(11.7%) of women had having ANC Visit 3 and above.

Medical related characteristic of women's

Among 325 women tested for Anemia one third 98(30.2%) was anemic whose Hgb concentration was below 11 g/dl. Majority 312(96.4%) of the participant had tested for HIV among those tested 22(7%) had Positive result while the rest 290(93%) had Negative.

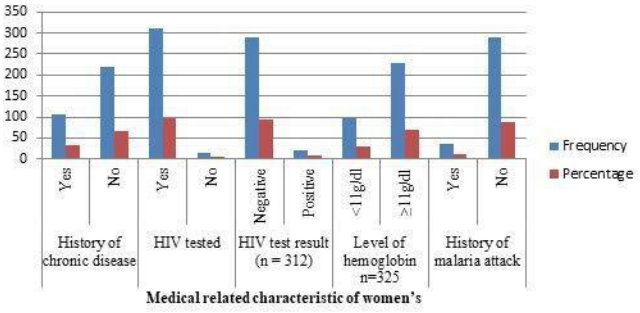

Figure 3. *Medical related characteristics of women who give birth in public hospitals in harar town, eastern Ethiopia, April 11 to May 17.*

Factors associated with preterm birth

In multivariable logistic regression analysis: women who do not attending ANC follow up, maternal, hemoglobin level, history of chronic disease and History of APH were statistically significant Women who didn't attend ANC were 1.5 times (AOR=1.5, 95% CI: 0.7, 2.3), those who had history of ante partum hemorrhage were 1.3 times (AOR=1.3, 95% CI: 0.2, 2.7) and women whose hemoglobin were less than eleven were 1.4 times (AOR=1.4, 95% CI: 0.2, 2.2) more likely to give preterm birth than counters (Table 3).

Table 3. *Factors associated with preterm births among mothers who gave birth in harar town public hospitals, Eastern Ethiopia, April 11 to May 17.*

Variable	**Preterm birth**		**COR (95% CI)**	**AOR (95% CI)**
	Yes	No		
Residence				
Urban	34(23.3%)	112(76.7%)	1	1
Rural	47(26.3%)	132(73.7%)	1.17(0.7,1.94)*	1.2(0.3,1.6)
History of preterm				
Yes	36(42.4%)	49(57.6%)	3.1(1.8,5.3)*	2.6(1.3,5.2)
No	45(18.8%)	195(81.2%)	1	1
Pregnancy type				
Planned	42(23.3%)	138(76.7%)	1	1
Unplanned	39(16.9%)	106(73.1%)	1.2(0.7,2.0)*	1.6(0.4,2.5)
Do you attend ANC				
Yes	60(25%)	180(75%)	1	1
No	21(24.7%)	64(75.3%)	1.3(0.5,1.8)*	1.5(0.7,2.3)*
Inter birth interval				
<24 Months	55(24.3%)	171(75.7%)	1.2(0.6,1.90)*	1.3(0.4,2.0)*
≥ 24 Months	26(26.3%)	121(73.7%)	1	1
History of Abortion				
Yes	29(29.3%)	70(70.7%)	0.72(0.42,1.22)*	0.5(0.2,1.2)
No	52(23%)	174(77%)	1	1
History of APH				
Yes	56(66.7%)	28(33.3%)	1.5(0.8,2.3)*	1.3(0.4,2.7)*
No	25(10.4%)	216(89.6%)	1	1
History of PIH				
Yes	20(26.7%)	55(73.3%)	0.8(0.5,1.6)*	0.7(0.3,1.2)
No	61(24.4%)	189(75.6%)	1	1
Onset of labor				
Spontaneous	69(24.5%)	213(75.5%)	1	1
Induced	12(27.9%)	31(72.1%)	1.2(0.5,2.45)*	1.3(0.3,2.8)
Hemoglobin level				
<11g/dl	26(26.5%)	72(73.5%)	1.1(0.6,1.94)*	1.4(0.3,2.2)**
≥11 g/dl	55(24.2%)	172(75.8%)	1	1
Hx of chronic disease				
Yes	27(25.7%)	78(74.3%)	1.9(0.6,2.4)*	1.3(0.4,2.3)**
No	54(24.5%)	166(75.5%)	1	1
Hx of malaria attack				
Yes	9(25%)	27(27%)	0.9(0.4,2.2)*	1.2(0.7,2.2)
No	72(24.9%)	217(75.1%)	1	1

Discussion

The prevalence of preterm births in this study was found to be 24.9%(95% CI 21.0, 29.8).These finding is consistent with study conducted in Brazil 21.7%, Nigeria 24%, 25.9%. The finding on this study was higher than the cross sectional study conducted in India 15%. Kenya 18.6%. Gondar town 4.4%, Debremarkos 11.6%, 11.7% and 13.3%. This discrepancy might be due to difference in, sample size, study area, sample size, study population and intervention done toward pregnant mother as well as socio demographic characteristics [9].

Mothers who had history of Ante partum during current pregnancy were 1.3 times more likely to have preterm birth compared to counterpart. These are consistent with study conducted. These might be due consequence of anemia following bleeding predispose to hypoxia and preterm to the new womb [10].

In these study mothers who had no ANC follow up were 1.5 times more likely to deliver preterm birth than counterpart. These in lined with study conducted. The association might be due to Antenatal visits of the pregnant mothers are very important as they provide chances for monitoring the fetal wellbeing and allow timely intervention for feto-maternal protection. This may be described to the routine provisions of nutritional and medical advice or care and supplementations offered during ANC visits.

Mothers who had inter birth interval at less than 24 months were 1.3 times more likely to have preterm births compared to mothers who had inter pregnancy interval greater than or equals to 24 months. These is similar with study done [11]. These might be due to existence of unidentified risk factors which precipitating preterm births in mothers with short inter pregnancy interval as well as it may be maternal related problems such as in ability to take care for close birth interval which might be due to socio economic status.

Women who had history of chronic disease were 1.3 times more likely to deliver preterm birth than counterparts. These in lined with study conducted. These might be due to maternal chronic illnesses may alter or limit the placental delivery of oxygen and nutrients to the developing fetus, possibly resulting in fetal growth restriction. In addition, they can increase the risk of preeclampsia and, thus increases the risk preterm birth. Therefore, acute maternal medical conditions might lead to preterm birth [12].

Finally women whose hemoglobin level is less than 11 g/dl were 1.4 times more likely to deliver preterm birth than counter parts. These in lined with study conducted. These might be due to fact effect of anemia on the oxygen bearing capacity and its transportation tendency to the placental site for the fetus.

Conclusion

The prevalence of preterm birth in Harar town public health hospitals is slightly higher than studies done in different parts of Ethiopia and still a major public health problem in the area. Not attending ANC, short inter pregnancy interval (<24 months), previous history of APH, Presence of chronic medical illness and low hemoglobin level (<11 g/dl) were found to be statistically significant with the occurrence of preterm birth in current pregnancy.

Recommendation

- Timely recognition of factor predisposes to ante partum hemorrhage and managing it promptly.
- Encourage mother to have Antenatal follow up and strengthening Antenatal care service.
- Encourage contraceptive usage and birth intervals.
- Health promotion and diseases prevention strategy should be strengthened.
- Iron provision for pregnant women should be strengthened.
- Identification and timely referral for specialized obstetrical evaluation and management of these who have high risk of preterm birth mothers in early pregnancy.

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