ADDIS ABABA UNIVERSITY
MEDICAL FACULTY
DEPARTMENT OF COMMUNITY HEALTH

BIRTH TO PREGNANCY INTERVAL AND ITS EFFECT ON PERINATAL OUTCOMES IN ADDIS ABABA.

A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES ADDIS ABABA UNIVERSITY

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH

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ACRONYMS

AAU- Addis Ababa University

APGAR - Appearance, Pulse, Grimace, Activity, Respiration

APH – Ante Partum Hemorrhage

CI – Confidence Interval

CS – Cesarean Section

DCH- Department of Community Health

DHS – Demographic and Health Survey

DM – Diabetes Mellitus

EC – Ethiopian Calendar

FMOH – Federal Ministry of Health

IUGR – Intra Uterine Growth Restriction

LBW – Low Birth Weight

MF – Medical Faculty

OCP – Oral Contraceptive Pills

OR – Odds Ratio

PIH – Pregnancy Induced Hypertension

PPH – Post Partum Hemorrhage

PROM – Premature Rupture Of Membrane

SVD – Spontaneous Vaginal Delivery

TVET – Technical Vocational Educational Training

UAE – United Arab Emirates

USA – United States of America

VLBW – Very Low Birth Weight

WHO – World Health Organization

ABSTRACT

Back ground*- Study findings on inter-pregnancy interval and birth outcome looks contradictory. Some report that it is a risk factor for adverse perinatal outcomes while others say it has no association. Still, there is no agreed time period (interval) recommended best for the good outcome of pregnancy.*

Objective *- To assess birth to pregnancy interval and its effect on perinatal outcomes in Addis Ababa.*

Methods- *Cross sectional study on a sample of 1339 mothers who deliver on health facilities in Addis Ababa is done. Mothers in each health facility are included in the study consecutively, until the required sample is achieved. Health facilities have been selected by simple random sampling after being stratified into three strata (Governmental hospital, governmental health center and private clinic/hospital). Data was collected using questionnaire and doing measurements. Data was processed and analyzed using EPI Info and SPSS computer soft wares. Univariate and bi variate analysis is employed.*

Result- *the rate of preterm, LBW and still birth was 7.1%, 5.6% and 3.1% respectively. The mean birth to pregnancy interval was* 45.9± 27.3 months (*95% CI 44.4, 47.3) and birth to pregnancy interval has no effect to poor perinatal outcome.*

Recommendations*- further study on the effects of birth to pregnancy interval to other perinatal outcomes and maternal well being has to be conducted.*

1. INTRODUCTION

1.1-BACKGROUND

Perinatal mortality is one of the indicators of poor obstetric care of a given community. This care might be explained either in the form of counseling, health education or technical capabilities. It is generally influenced by prenatal, intrapartal and subpartu conditions. The most common fetal conditions that lead to perinatal death include congenital anomalies, Intra Uterine Growth Restriction (IUGR) and sepsis. [(1)] Early neonatal death, which attributes to most perinatal deaths, is caused by preterm birth and low birth-weight. [(2)] Stillbirth also accounts for 74% of all perinatal deaths. [(1)]

Worldwide, it is estimated that, 7.6 million perinatal deaths occur annually; of which 98% take place in developing countries. [(3)] In Ethiopia a community-based study conducted to see the risk factor for outcome of prolonged labor in rural Ethiopian women giving birth at home showed a perinatal mortality of 45/1000 births. [(4)]

The birth-weight of an infant is the single most important determinant of newborn survival; Neonatal illness in general is closely related to low birth-weight. More than 20 million infants world wide, (representing 15.5 percent of all births) are born with Low birth weight (LBW). Low birth weight in sub Saharan Africa is around 15%. [(5)] Some epidemiological observations revealed that infants born under-weight (less than 2500gram) are approximately 20 times more likely to die than heavier babies. [(5)]

In Ethiopia; studies showed that the prevalence of low birth weight varies from 6 – 10 %, [6] another retrospective study conducted to establish birth weight changes at Tikur Anbessa hospital showed that low birth weight has increased trend between 1976 and 1996. [7]

More than 60% of all low birth-weight, globally, is preterm. Some are both premature and growth retarded while others may be full term but under weight (small for gestational age). [8] Preterm birth is the single most common causes of perinatal mortality in Europe and North America. [9]

In Ethiopia, study done at Tikur Anbessa showed that preterm birth has increased from 5.5% to 8.7% between 1980's and 1990's. [7] The low birth weight situation of Addis Ababa according to the 2005/06-health report of Addis Ababa health bureau revealed that among all deliveries attended from health institutions reporting to the regional health bureau is 11%. [10]

Stillbirth rate is an important indicator of access to and quality of antenatal and delivery care. Stillbirth prevalence at community level is typically less than 1% in more developed parts and could exceed 3% in less developed regions. [11] Some research revealed that, globally, there are 3.2 million (2.5 - 4.1million) stillbirths per year. The rate in Sub-Saharan Africa is 32 per 1000 births. [12]

In Ethiopia a study reported that the prevalence of stillbirth is 19/1000 births. [4] A study done at Tikur Anbessa has shown a stillbirth rate of 53.3/1000 births and contributed to 77.2% of gross

perinatal mortality. [13] The Ethiopian DHS 2005 data indicated that the still birth rate is 1.8 %. [14] The Addis Ababa health bureau 2005/06 report revealed that the prevalence of stillbirth is 2.5%. [10]

Though, the time period (risk period) of inter-pregnancy interval to adverse perinatal outcome is not specifically isolated and suggested yet, different studies showed that inter-pregnancy interval is one of the determinant factors for preterm birth, low birth weight, small for gestational age births and stillbirth. [15, 16] Knowing the association of inter-pregnancy interval to those adverse perinatal outcomes will help the primary prevention employed against it to be easy, safe and cost effective.

In Ethiopia, 20% of non-first births occur less than 24 months after the preceding birth, with 8% occurring less than 18 months after the preceding birth. About 43% of women give birth at least 36 months after the previous birth. The over all median birth interval is 34 months. Pregnancies that occur at less than a 15-month interval are at more than three times the mortality risk of pregnancies that occur after long intervals. [17].

One study done at Tikur Anbessa and St. Paul's hospital on the impact of spacing on out comes of pregnancy has shown that conceiving within 12 months of previous delivery is a critical interval to cause low birth-weight baby. Short inter-pregnancy interval together with other socio-demographic factors is responsible for unfavorable birth outcomes. [18].

The study done at Tikur Anbessa and St. Paul's hospital was the only study ever conducted in Ethiopia to see any association between inter-pregnancy interval and perinatal outcomes. The study was conducted basing on two referral hospitals only.

1.2 RATIONALE OF THE STUDY

In Ethiopia, high proportion of short birth interval, high rate of preterm, low birth weight, and stillbirths are reported. There is scarcity of studies conducted investigating the association between birth interval and adverse perinatal outcomes.

From the findings what has been observed so far; the issue of inter-pregnancy interval and birth outcomes remain unresolved. Though, there are recommendations made as to what the inter pregnancy interval could be, it doesn't show any causal relationship. Therefore, for the better understanding of the effects of inter-pregnancy interval on birth outcomes and to reduce the problem associated with either long or short inter-pregnancy interval the need to determine birth to pregnancy interval remains critical.

Knowing the association of inter-pregnancy interval to adverse perinatal outcomes (prematurity, low birth-weight and stillbirth) will help the primary prevention employed against it to be easy, safe and cost effective. Therefore, this study aims to assess the birth to pregnancy interval and its effect on perinatal outcomes in Addis Ababa, which might fill the research gaps with fairly adequate sample size and including many institutions. This study will also serve as a baseline study to conduct other analytical studies in the topic. The information gained will give a clue as to what health professionals in Addis Ababa should recommend birth spacing to their clients.

2. LITERATURE REVIEW

2.1 BIRTH TO PREGNANCY INTERVAL

The median birth to pregnancy interval among women in less developed countries who breast fed their infants is approximately three years. [19] In Ethiopia, 20% of non-first births occur less than 24 months after the preceding birth, with 8% occurring less than 18 months after the preceding birth. About 43% of women give birth at least 36 months after the previous birth. The over all median birth interval is 34 months. Pregnancies that occur at less than a 15-month interval are at more than three times the mortality risk of pregnancies that occur after long intervals. [17]

One study done at Tikur Anbessa and St. Paulo's hospital on the impact of spacing on outcome of pregnancy has shown that conceiving within 12 months of previous delivery is a critical interval to cause low birth-weight baby. Short inter-pregnancy interval together with other socio-demographic factors is responsible for unfavorable birth outcomes. [18]

Inter-pregnancy interval as a risk factor for adverse perinatal outcomes has "U" shaped distribution. [20] Though, the time period (risk period) was not specifically isolated and suggested yet, some studies reported that inter-pregnancy intervals of less than 4 months and greater than six years is identified as a maternal risk condition for adverse perinatal outcomes. [20] Other studies also showed that inter-pregnancy intervals shorter than 18 months and greater than 59 months are significantly associated with adverse perinatal outcomes. [16] It was also reported in Latin America, that inter-pregnancy interval less than 12 months and greater than 59 months are independently associated with increased risk of adverse perinatal outcomes. [3]

2.2 BIRTH TO PREGNANCY INTERVAL AS RISK FACTOR FOR LOW BIRTH-WEIGHT AND PRETERM BIRTH.

The birth weight of an infant is the single most important determinant of newborn survival; Neonatal illness in general is closely related to low birth-weight. More than 20 million infants world wide, (representing 15.5 percent of all births) are born with LBW. Low birth-weight in sub Saharan Africa is around 15 %. [5] Some epidemiological observations revealed that infants born with low birth-weight (less than 2500gram) are approximately 20 times more likely to die than heavier babies. [5]

In Ethiopia studies showed that the prevalence of low birth-weight varies from 6 – 10 %, [6] another retrospective study conducted to establish birth-weight changes at Tikur Anbessa hospital showed that low birth-weight has increased trend between 1976 and 1996. [7]

The low birth-weight situation of Addis Ababa according to the 2005/06-health report of Addis Ababa health bureau revealed that among all deliveries attended from health institutions reporting to the regional health bureau is 11%. [10]

Low birth-weight is caused by premature delivery, congenital anomaly, Intra uterine infections, chronic medical illness, multi-fetal gestation or by fetal retardation. It is influenced by nutritional status of the mother and hence reflects the health status of community in to which they are born. [21, 22, 23]

Preterm birth are generally predisposed by pregnancy induced hypertension, chronic medical illness, infections, drug abuse, previous preterm birth, multi-fetal gestation and complications of pregnancy like APH, hydraminos …etc. [22, 23]

There are several studies done on the effect of inter-pregnancy interval on LBW and preterm birth. Some studies showed inter-pregnancy interval as a risk factor while others don't. A study in Scotland has shown that short inter-pregnancy interval was more likely to have an extremely preterm birth and a moderately preterm birth and it is an independent risk factor for preterm delivery and neonatal death in the second birth. [15]

A study done in Latin America showed that infants conceived less than six months has 80-100% increased risk of LBW and VLBW compared to infants conceived 18-23 months; and infants conceived 60 months or more after a birth had about 20% risk of LBW and 25% risk of VLBW. [3]

The North Carolina (USA) study showed that short pregnancy interval exerts its influence on risk of death in infancy through its effect on birth-weight. The estimated reduction in prematurity and infant mortality that might result from the elimination of short pregnancy intervals was 5% and 6% respectively. [24] Another study in UAE, reported that inter-pregnancy interval is a risk factor for spontaneous preterm birth. [9]

A study done in Brazil showed that no association between birth to conception interval and preterm delivery, [25] and another study in Boston (USA) says there is no relations between inter-pregnancy intervals and risk of preterm birth. [26] A study in Egypt showed that the rate of

preterm increased with increasing inter-pregnancy interval until 49-60 months; however, the study reported that it was not significant. [27]

2.3 BIRTH TO PREGNANCY INTERVAL AS RISK FACTOR FOR STILLBIRTH

The causes of still birth can broadly be grouped into placental problems, birth defects, IUGR, and infections. [22, 23] Stillbirth rate is an important indicator of access to and quality of antenatal and delivery care. Stillbirth prevalence at community level is typically less than 1% in more developed parts and could exceed 3% in less developed regions. [11] Some research revealed that, globally, there is 3.2 million (2.5 - 4.1million) still birth per year and the rate in sub-Saharan Africa is 32 per 1000 births. [12]

In Ethiopia a study reported that the prevalence of stillbirth is 19/1000 births. [4] A study done at Tikur Anbessa has shown that stillbirth rate of 53.3/1000 births and contributed to 77.2% of gross perinatal mortality. [13] The Ethiopian DHS 2005 data indicated that the stillbirth rate is 1.8%. [14] The Addis Ababa health bureau 2005/06 report revealed that the prevalence of stillbirth is 2.5%. [10]

The role of inter-pregnancy interval on stillbirth remains controversial. One study in Sweden showed that maternal characteristics have confounded the association between short inter-pregnancy interval and stillbirth. Other studies showed that women with inter-pregnancy intervals longer than 71 months were associated with increased risk of still birth. [28] A study in

Latin America reported that spacing pregnancy could appropriately prevent stillbirth and neonatal death. [3].

2.4 PROGRESSES ON BIRTH TO PREGNANCY INTERVAL

The WHO, through its technical committee on birth spacing, tries to recommend the best time of birth spacing for the health risks and benefits of individuals and couples. On the basis of evidence WHO has; the technical committee fell into two groups- those who considered that the most suitable recommended interval was 18 months and those who considered interval of 27 months. However, they generally agreed that birth to pregnancy intervals shorter than 18 months should be avoided. But, with consensus the two groups reached into agreement that the recommendation for the minimum interval between a live birth and attempting next pregnancy should be 24 months. [29]

From the findings what has been observed so far; the issue of inter-pregnancy interval and its effect on perinatal outcomes remain unresolved. Though, there are recommendations made as to what the inter-pregnancy interval could be to reduce poor perinatal outcomes but the association doesn't show any causal relationship. Therefore, for the better understanding of the effects of inter-pregnancy interval on perinatal outcomes and to reduce the problem associated with either long or short inter-pregnancy interval the need to determine birth to pregnancy interval remains critical, WHO still recommends further study on this topic.

Despite the adverse outcome the inter-pregnancy interval incur, the issue how to counsel clients on birth spacing remain unresolved. In the definition of family planning: birth spacing is one of the chief component, but health professionals working in the area of family planning service

didn't have concrete evidence as to what time should they advice their client when they wish to space their birth.

Conducting research on inter-pregnancy interval and perinatal outcomes has mostly been found confounded by socio-demographic situations and other factors like violence and access to medical care. Maternal nutrition is one of the known confounder in this topic but obtaining maternal nutrition at a point in time basis and reviewing from registered data is not appropriate rather, it is best if it is done in a longitudinal basis. Most researches in this topic use secondary data. Where, those data's are not primarily collected for that purpose. So that, many variables may not been registered at all or there is a high degree of missing values.

In this study, a cross sectional study on influence of inter-pregnancy (Birth to pregnancy) interval on perinatal outcomes at health institutions has been done. It was observed that data coming from health institution are misleading; one thing because most deliveries are attended at home especially in developing countries. And the other thing is most cases coming to health institutions are referrals and are high risk conditions with bad outcomes that may bias the finding.

This study has used primary data where data on most known confounders are collected and we have done our research in area where majority of the delivery (78%) is taking in health institutions. [10,14] and we have exclude those referred from areas out of the catchments. By applying these techniques we have tried to avoid the problem that other researches face.

3. OBJECTIVES

3.1 GENERAL OBJECTIVE

3.1.1- To assess birth to pregnancy interval and its effect on selected perinatal out comes (prematurity, LBW, still birth) in Addis Ababa.

3.2 SPECIFIC OBJECTIVE

3.2.1- To estimate average pregnancy intervals.

3.2.2- To assess the magnitude of low birth-weight, prematurity and stillbirth.

3.2.3- To assess the influence of pregnancy intervals on perinatal outcomes.

4. METHOD

4.1- STUDY SETTING - a cross sectional study was conducted on mothers who deliver on health facilities in Addis Ababa.

Addis Ababa, capital city of Ethiopia, is with an estimated population of 2.9 million. The town is divided into ten sub-city and 100 kebele administrations. The town has twelve hospitals, 29 health centers, 130 clinics, 43 health station and 382 private clinics with potential health service coverage of 143%. [30]

Health care facilities that give delivery service in Addis Ababa includes: five governmental, one Police and two Army hospitals; 21 governmental health centers and 32 private clinics and hospitals. In 2005/06, there were a report of 31,952 deliveries (1,500 – 3000 deliveries per month) attended by different health institutions in Addis Ababa (excluding institutions that report to the FMOH). From reports it was found out that the share of private health institution in the delivery service is between 25- 30%, government health centers between 40-45%, government hospitals 30-35%.[10]

In this study we used primary data by interviewing mothers coming for delivery service, where data on most known confounders are collected.

4.2 - STUDY POPULATION

4.2.1 - Source population – We enrolled all mothers coming to health facilities to give delivery at least for the second time.

Inclusion criteria

- All laboring mothers who had at least one live-birth preceding to this pregnancy with no history of abortion in between this pregnancy and the preceding pregnancy.
- Place of residence is Addis Ababa.
- Singleton deliveries.

Exclusion criteria

- Primi gravida.
- The outcome of preceding pregnancy is abortion.
- Multiple pregnancies.
- Referals from outside of Addis Ababa

4.2.2 - Sample size- using a single population proportion formula

$$S = \frac{P*(1-P)*Z^2}{D^2}$$

P- Proportion of outcome expected is taken the prevalence of still birth- 1.8% [14]

Z- Confidence limit – 95%

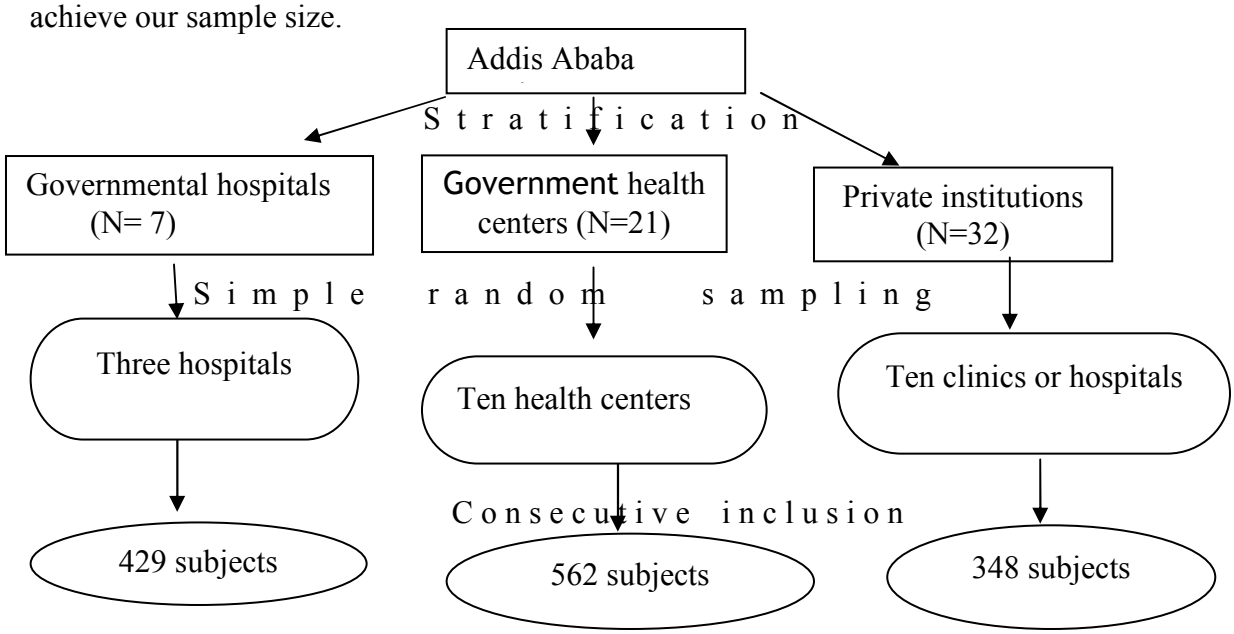
D- Margin of error – 0.75 %

With these assumptions and adding non response rate of 5% the required sample size was 1339.

4.2.3 - Sampling procedure

Health institutions were stratified into government hospitals, government health centers and private institutions. We select three hospitals, ten health centers (one from each sub-city), and ten private clinics (one from each sub-city) by simple random sampling. The number of subjects selected from each stratum was determined according to the proportion of the service they render.

All mothers who are eligible to the study were included in the study consecutively until we achieve our sample size.



4.3 - DATA COLLECTION

4.3.1 – Data collection tools

Data was collected using a pre-tested questionnaire prepared in Amharic. Birth weight of the baby was measured by using a baby scale graded in grams. The baby was weighed without additional clothing within ten minutes after delivery and before taking anything per mouth. The weight scale was always checked for the labeling whether it reads zero or not before weighing is attempted.

Birth to pregnancy interval was calculated by counting the time period from the start of the index pregnancy (as evidenced by last menstrual period) and the date of the preceding live birth. The data collectors write the month and extra days they calculated and again transcribe the days in to nearest month. In estimating gestational week, when there are extra days it is counted to the near lowest gestational age. Weight for gestational age is computed by using standards of LUBCHENCO curve. [31]

4.3.2 - Data collectors

Data collectors were nurses and midwives working in the health institutions selected for the study. Data collectors were given one day training on the content of the questionnaire and how to collect the data. Each data collector has done five pre tests. Then the questionnaire was structured. Data was collected throughout the day (including night). The total data collection time was five months from December 1st 2006 to April 28/2007.

We have employed five supervisors who took similar training with data collectors. They supervise the completeness, accuracy and consistency of data. The filled Questionnaire was

collected and signed by supervisor after it is checked for any missing value, correctness and consistency.

4.3.3 - Variables

The questionnaire consists of three parts:-

- The first part contains the socio-demographic data of the mother; that includes age, occupation, ethnicity, marital status, education, employment & income.
- The second part is past medical, obstetric and gynecologic history that includes last menstrual period, gestational age of the index pregnancy, date of delivery of the preceding birth, parity, gravidity, previous pregnancy complication and outcome, complication of current pregnancy, history of chronic medical illness, contraceptive use, drug use & smoking history, RH factor.
- The third part was on the outcomes of the current pregnancy that includes condition of the baby (live or dead), status of baby (APGAR score), weight of baby, sex of baby and complications of labor.
- Dependent variable –

1. These were poor (adverse) perinatal outcomes pre maturity, low birth weight and still birth.

2. Birth to pregnancy interval of < 24 months and >=24 months and <60 months and >=60 months.

4.3.4 - Operational definitions.

Birth to pregnancy interval- The time period between the start of the index pregnancy (as evidenced by last menstrual period) and the preceding live birth.

If a mother is found to have a history of abortion in between the live birth and index pregnancy, she will not be included in the study. The presence of abortion between index pregnancy and live birth may affect the study in anyway. It will be good if such occurrences are studied in studies like spacing after abortion.

Birth interval is classified as <18 months and >=18 months and <60 months and >=60 months

Live birth- The complete expulsion or extraction of the product of conception from the mother, regardless of the duration of pregnancy, which after such a separation, breathes or shows other evidence of life (e.g. Beating of the heart, pulsation of the umbilical cord or definite movements of the involuntary muscles) whether or not the cord has been cut or placenta detached.

Mature infant- infant born after 37 completed weeks of gestation up until 42 completed weeks of gestation

Premature infant- one with a gestational age of 28 weeks to less than 37 weeks.

Low birth weight- any infant weighing less than 2500 gram at birth.

Fetal death (Still birth) - The absence of signs of life at birth.

Abortion- fetus removed or expelled from the uterus in 28 weeks or less and weighing less than 500 gram.

Small size for gestational age- less than 10^{th} centile from standard Lubchenco curve.

Last menstrual period- the date of the starting of last menstruation the women had to the index pregnancy.

4.3.5 – Data processing and analysis

Data was entered, cleaned and analyzed using EPI 6 and SPSS 11.0 computer software programs. Seventy (5%) questionnaires were selected at random and checked for data entry error, missing value or any inconsistency.

All variables have been analyzed except income of mothers where there was 24.6% missing value. Besides, reports from data collectors and supervisors revealed that even for those with a response on income the figures were not reliable.

Recoding and transformation of some data is done. Accordingly the variable age of respondent's (maternal age) was classified to an age category of five years interval. In the variable educational status, able to read and write are classified under elementary. TVET and preparatory are merged and classified into secondary. In the variable religion catholic was merged into other. The variable Occupation is re-classified in to three categories- Housewives, self employed and government employed.

In the variable housewife category besides the housewives the unemployed are added. In the self employed variable occupations like merchant, small scale business, daily laborer, food and drink seller, and handcraft are merged. In the government employee variable occupations like teacher, health professional, office workers are included.

The univariate analysis such as proportions, percentages, ratios, frequency distributions and appropriate graphic presentations besides measures of central tendency, measures of dispersion and confidence intervals were used for describing data.

Association of socio-demographic, past medical and obstetric history and current pregnancy outcomes and birth to pregnancy intervals were determined using cross-tabulating, chi square test and odds ratio (OR) with 95% confidence intervals. Multiple logistic regression was used to control for confounding.

4.4 - ETHICAL CONSIDERATION

Ethical approval was obtained from research and publication committee of Addis Ababa university- medical faculty. Permission was obtained from head of each health facility. Verbal consent was sought from selected participant to confirm willingness to participate in the study. To ensure confidentiality interview was held in private. Confidentiality was ensured through out the process. Advice has been given for mothers with deliveries of adverse birth outcomes. They have got full information what to do next to their baby if found being under weight and premature. Vaccination to the baby and birth control methods for the mother was advised.

4.5 STRENGTH AND LIMITATION OF THE STUDY

4.5.1- strength

The information is obtained directly from clients (primary data) that avoids missed information and record error, measurements are done specifically for this study and data collectors are trained to do so. We have big sample size and covered all segments of health institutions so that it is more representative to Addis Ababa population.

4.5.2 - Limitation

Some variables like past medical and obstetric history are liable to have recall bias and some are even difficult to define by mothers. Most of the time information is obtained while mothers are in labor or immediately after birth that may create physical and emotional exhaustion which may aggravate the recall bias.

Income of mothers was not included in the analysis of this study but it was believed to be one of the known confounder in association of findings.

4.6 - DISSEMINATION OF THE RESULT

Two copies of the final thesis report will be kept in the library of AAU MF DCH, Other copies will be sent to AAU MF department of obstetrics and Gynecology, Addis Ababa health bureau family health department, FMOH family health department and professional societies (Ethiopian Obstetrics and Gynecology society, Ethiopian Midwifery society, Ethiopian pediatric society and Ethiopian public health association).

The findings will be presented in scientific conferences; finally the findings will be sent for publication in peer reviewed journals.

5. RESULT

5.1 – DESCRIPTION OF THE STUDY SUBJECTS

5.1.1 – Socio demographic characteristics of study subjects

Data was collected from three government hospitals, ten government health centers and ten private health institutions. A total of 1339 mothers [432(32.3%) from government hospitals, 559(41.2%) from government health centers and 348(26%) from private health institutions] were interviewed. As shown in table one, 582(43.5%) mothers were in the age group of 25-29 and 12(0.9%) were below the age of twenty years. The mean age was 28$\pm$ 4.5, ranging from 17 to 41 years. Concerning educational status, 291(21.7%) were illiterate, 431(32.4%) had elementary school education, 461(34.6%) secondary and 148(11.1%) tertiary education. A total of 890(66.5%) mothers were followers of Orthodox Christian, 265(19.8%) Muslims and 172(12.8%) Protestants. Majority of mothers 1282(96.1%) were married. Five hundred and seventy (42.6%) were Amhara, 313(23.4%) Gurage, 274(20.5%) Oromo and 93(6.9%) Tigre ethnicity. Most 948(70.8%) were housewives occupational.

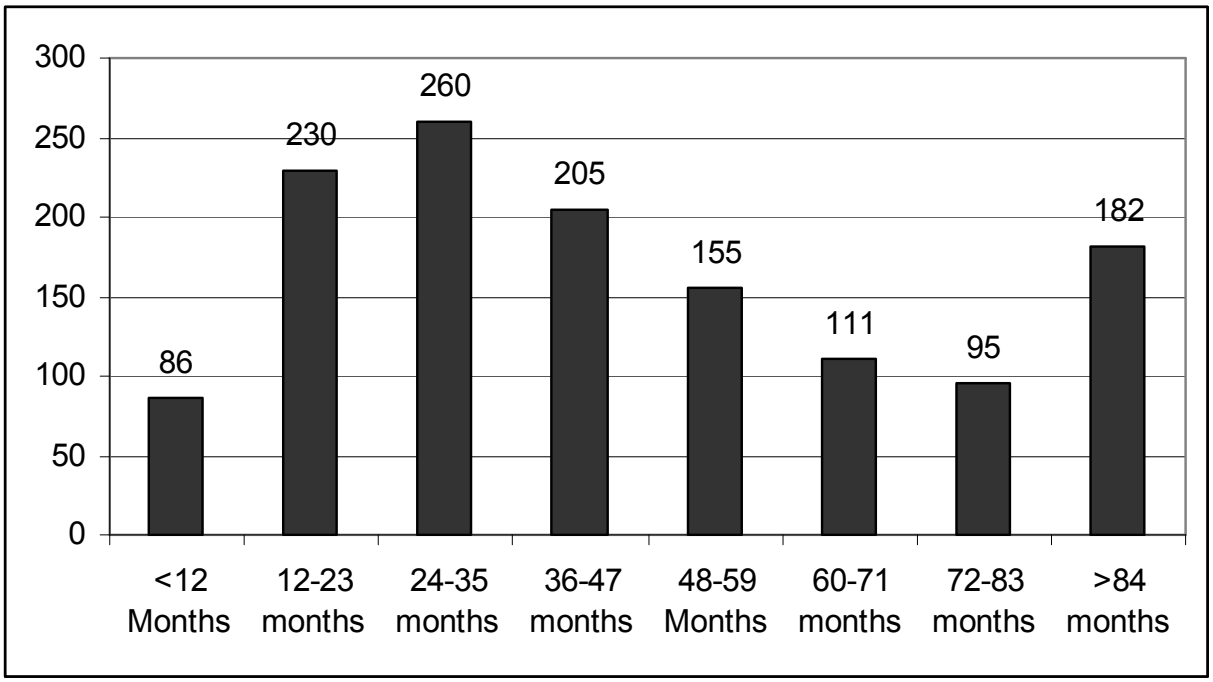
Table 1 -*Socio demographic characteristics of mothers giving birth for the second time and above in Addis Ababa health institutions Dec. to April 2007*

Characteristics (N= 1339)	**No. (%)**
Age in years category	
15-19	12(0.9%)
20-24	258(19.3%)
25-29	582(43.5%)
30-34	327(24.4%)
≥35	159(11.9%)
Marital status	
Married	1282(95.7%)
Divorced	23(1.7%)
Widowed	5(0.4%)
Single	24(1.8%)
No response	5(0.4%)
Educational status	
Unable to read and write	291(21.7%)
Elementary	431(32.2%)
Secondary	461(34.4%)
Tertiary	148(11.1%)
No response	8(0.6%)
Religion	
Orthodox	890(66.5%)
Protestant	172(12.8%)
Muslim	265(19.8%)
No response	12(0.9%)
Ethnic group	
Amhara	570(42.6%)
Oromo	274(20.5%)
Gurage	313(23.4%)
Tigre	93(6.9%)
Other	69(5.2%)
No response	20(1.5%)
Occupation	
House wife	948(70.8%)
Self employed	216(16.1%)
Government employed	155(11.6%)
No response	20(1.5%)

5.1.2 – Past obstetrics history and current pregnancy outcomes of the study subjects.

As shown in table two, 86(8.4%) mothers has a birth interval less than 12 months and 316(23.9%) has birth to pregnancy interval less than 24 months. While 277(20.7%) has greater than 72 months and 388(29.2%) has greater than 60 months. The estimated average Birth to pregnancy interval was 45.9± 27.3 months with 95% CI (44.4, 47.3). The median birth interval was 40 months ranging from 2 month to 99 months.

Fig 1 – *Bar graph showing the distribution of birth to pregnancy intervals among mothers who give birth for two or more times in Addis Ababa health institutions Dec to April 2007*



As shown in table three, the majority 834(62.3%) mothers parity is 2&3 and 135(10.1%) have four and above parity. The estimated average parity is 2.2± 1.2. The median parity is two with parity interval of one to twelve.

As shown in table three, the majority 1098(82%)mothers gravidity is 2 & 3, and 230(17.5%) have four and above gravidity. The estimated average gravidity is 2.7± 1.12. The median gravidity is two with gravidity interval of two to thirteen.

Eight hundred eighty two (34.1%) mothers pregnancy is unplanned, and in 369(80.7%) of the cases it happened accidentally, in 82(17.5%) of the cases it happens by contraceptive failure. Among the contraceptives which fail OCP accounts 59.3%.

Table 2- *Past obstetrics history of mothers who give birth for two or more times in Addis Ababa health institutions Dec to April 2007*

Characteristics (N=1339)	**No. (%)**
Birth to pregnancy Interval in months	
<12	86(6.4%)
12-23	230(17.2%)
24-35	260(19.4%)
36-47	205(15.3%)
48-59	155(11.6%)
60-71	111(8.3%)
>72	277(20.7%)
Un known	14(1.1%)
Number of Parity	
1	359(26.8%)
2 and 3	834(62.3%)
4 +	135(10.1%)
Un known	11(0.8%)
Number of Gravidity	
2 and 3	1098(82%)
4 +	230(17.5%)
unknown	11(0.8%)
Is current pregnancy planned	
Yes	882(65.9%)
No	457(34.1%)

Pregnancy complications to the index pregnancy has happened in 103(7.8%) of the cases, the leading cause of pregnancy complication is APH 31(27.7%) followed by PIH 28(25%) and hyper emesis 20(17.9%). The male to female ratio of the preceding birth was 1.15.

Eight hundred sixty one (64.3 %) of mothers has used contraceptive before they become pregnant to the index pregnancy, Depo provera is used by 739(55.2%) of the mothers and OCP by 97(37.2%).

The period after the mother has stopped taking contraceptive till she gets pregnant ranges from one month to 93 months, the mean time being 8.5 $\pm$ 12.3 months. Eighty six (10%) of mother conceived within one month after discontinuing their contraceptive. Nearly 48% do so within 12 months. 82(9.5%) conceived while taking the contraceptive.

The period that mothers used contraceptive ranges from one month to 100 months, the mean duration being 33$\pm$ 22.5 months. Among mothers who used contraceptive 646(75%) have used contraceptive at least one year and above.

Forty three (3.2%) mothers coming for delivery report that they have chronic medical problem. Among it, diabetes constitutes 13(32.5%), hypertension 12(27.9%), cardiac disease 4(9.3%) and tuberculosis 3(6.9%).

Ten mothers have reported they ever use narcotics, of whom three said they are still using. The duration of use since they started narcotics ranges from 3 – 96 months. Out of the seven who are not current narcotic users, it is 2–60 months that they stop using the narcotics prior to their

pregnancy. Nine mothers report that they ever smoke cigarette, three are still smoking. The duration of their smoking habit is all less than one year (4 - 12 Months). They smoke 1-8 cigarettes per day. The gap between stopping smoking and pregnancy, among those who stopped smoking ranges from one year to 12 years.

Table 3- *Current pregnancy complications and preceding birth outcomes of women who give birth for second time and more in Addis Ababa health institutions from Dec to April2007.*

Characteristics (N=1339)	**No. (%)**
Do the current pregnancy has complications	103(7.8%)
YES	1225(92.2%)
NO	11(0.8%)
unknown	
Types of complications	31(27.7%)
APH	11(9.8%)
poly hydraminos	2(1.8)
cervical incompetence	28(25%)
PIH	14(12.5%)
PROM	20(17.9%)
hyper emesis	6(5.4%)
Preceding birth outcome	
Preterm Birth	14(1%)
Cesarean section	122(9.1%)
PPH	19(1.4%)
SVD	1217(90.9%)
Preceding Birth/child/ sex	
MALE	712(53.2%)
FEMALE	620(46.3%)
No response	7(0.5%)
Use of contraceptive in current pregnancy	
Yes	861(64.3%)
No	478(35.7%)

Table 4 shows that, among all deliveries attended 171(12.8%) had experienced complications out of which 62.6% is managed in hospitals, the leading 64(37.4%) cause of labor complication was

prolonged labor followed by mal position/ mal presentation 45(26.3%), neonatal asphyxia 26(15.2%) and obstructed labor 17(9.9%).

Deliveries that are completed spontaneously with vaginal delivery are 1050(78.6%) and 218(16.3%) delivered through cesarean section, a total of 1294(96.6%) of the neonates born alive and 42 born being dead in utero making the rate of still birth to mothers who deliver for the second time 3.1%.

The mean birth weight of the neonates was 3172± 515 grams with 95% CI (3144, 3200). The rate of low birth weight was 7.2%. Among all deliveries attended, when the birth weight was computed to their gestational age, 109(8.4%) had $<10^{th}$ centile value showing low birth weight (small) for gestational age. Nine (0.7%) neonates were born with different types of congenital malformations like club foot, anencephaly, cleft palate …. out of the nine congenital malformations seen four were stillbirths.

The preterm birth rate of mothers who give birth for second time and above is 7% and post term was 5%. The mean gestational age was 39.2±2.1 months with 95% CI (39.1, 39.3).

The male to female ratio of the current birth was 1.05.

Table 4– *Current pregnancy outcome and complications of mothers who give birth for two or more times in Addis Ababa health institutions from Dec to April 2007*

Characteristics (N=1339)	**No. (%)**
RH type	
Positive	1218(91.9%)
Negative	51(3.8%)
Unknown	70(5.2%)
Complications of labor	
YES	171(12.8%)
NO	1168(87.2%)
Methods of delivery	
Vaginal	1050(78.4%)
Cesarean section	218(16.3%)
Instrumental	57(4.3%)
Augmentation or Induction	10(0.7%)
No response	3(0.2%)
Is the neonate born alive?	
YES	1294(96.6%)
NO	42(3.1%)
No response	3(0.2%)
Birth weight	
low birth weight	94(7.2%)
normal birth weight	1212(90.3%)
Un known	33(2.5%)
Gestational age	
Pre Term	93(7%)
Term	1165(86.9%)
Post Term	75(5.6%)
Un known	6(0.4%)
Sex of new born (N=1305)	
Male	667(49.8%)
Female	638(47.6%)
No response	34(2.5%)

5.2 – FACTORS ASSOCIATED WITH CURRENT PREGNANCY OUTCOMES

5.2.1- Factors associated with pre term birth

Preterm birth happens in 7.1% of the cases. Mothers of the age group ≥35 has the highest proportion 18(11%) of preterm delivery, Mothers who are unable to read and write has highest rate 26(9%) of preterm delivery. Protestants has the highest 18(10.5%) preterm delivery. Self employed have the lowest rate of preterm birth 10(4.7%). Deliveries that happen following contraceptive failure have high preterm birth 9(11%). But all these variations are not statistically significant differences.

Deliveries that happen from mothers who have complications of pregnancy like PIH and APH had highest preterm birth (21.4% and 29% respectively). The presence of any form of pregnancy complication to current pregnancy with OR 3.1 and 95% CI = [1.8, 6.2] has a statistically significant association to preterm birth.

Those mothers who has experienced complication of labor, PPH, in the preceding delivery have highest 4(21%) preterm birth. And this occurrence with OR 3.8 and 95% CI= (1.2, 12) has a statistically significant association to preterm birth.

Mothers who have a known chronic medical problems like DM, HTN and cardiac disease has high(14%-25%) preterm birth but those with TB has no preterm birth. Those who have a history

of use of narcotics and cigarette smoking have highest preterm birth (10-11%). but, this all association is not statistically significant.

No statistically significant association was observed between birth to pregnancy interval and preterm birth.

Table 5- *Socio-Demographic Characteristics of pre term birth in Women who give Birth for two or more times in Addis Ababa health institutions from Dec to April 2007*

Variables	Pre term birth (7.1%)		
	Yes N=94	OR (95% CI)	Adjusted OR (95% CI)
Age of mother			
15 – 19	1(8.3%)	1.00	1.00
20 – 24	15(5.8%)	0.7 [0.08,5.6]	0.46[0.05,4.17]
25 – 29	41(7.1%)	0.8[0.11,6.6]	0.65[0.07,5.7]
30 - 34	19(5.9%)	0.68[0.08,5.6]	0.54[0.06,4.9]
≥ 35	18(11%)	1.45[0.18,11.9]	0.94[0.1,8.6]
Educational status			
Unable to read &write	26(9.0%)	1.00	1.00
Elementary	29(6.8%)	0.7[0.4,1.2]	0.64[0.36,1.15]
Secondary	28(6.1%)	0.65[0.4,1.1]	0.5[0.3,0.95]*
Tertiary	11(7.4%)	0.8[0.4,1.7]	0.7[0.3,1.8]
Religion			
Orthodox	60(6.8%)	1.00	1.00
Protestant	18(10.5%)	1.6 [0.9,2.8]	1.5[0.81,2.8]
Muslim	15(5.7%)	0.8 [0.5,1.5]	0.85[0.47,1.6]
Occupation			
Housewife	73(7.7%)	1.00	1.00
Self employed	10(4.7%)	0.6 [0.3,1.2]	0.7[0.34,1.4]
Government employed	8(5.2%)	0.7 [0.3,1.4]	0.57[0.23,1.4]

Table 6- *Past obstetrics history and Birth to pregnancy intervals Characteristics of pre term birth in Women who give Birth for two or more times in Addis Ababa health institutions from Dec to April 2007*

Variables	Pre term birth (7.1%)		
	Yes N=94	OR 95% CI	Adjusted OR 95% CI
Parity			
1	29(8.1%)	1.00	1.00
2 and 3	56(6.7%)	0.8[0.5,1.3]	1.02[0.6,1.8]
≥4	10(7.5%)	0.9[0.4,1.9]	0.6[0.2,2.1]
Gravidity			
2 and 3	76(6.9%)	1.00	1.00
≥4	19(8.3%)	1.3[0.74,2.2]	1.29[0.55,2.7]
Preceding pregnancy outcome			
Pre term	3(21.4%)	3.6[0.98,13.3]	3.8[0.89,16.5]
SVD	82(6.8%)	0.7[0.4,1.44]	0.74[0.36,1.5]
PPH	4(21%)	3.8[1.2,12]*	5.1[1.5,17.1]*
C/S	11(9%)	1.3[0.7,2.6]	-
Current pregnancy			
Current pregnancy planned	59(6.7%)	0.9[0.6,1.4]	1.01[0.6,1.7]
Contraceptive failure	9(11.4%)	2[0.9,4.2]	1.6[0.7,3.9]
Complications to current pregnancy	18(17.5%)	3.1[1.8,5.5]*	3.4[1.8,6.2]*
RH factor			
Positive	87(7.2%)	1.00	1.00
Negative	3(6%)	1.9[0.6,6.4]	0.9[0.25,2.9]
Unknown	3(4.3%)	0.5[0.2,1.8]	0.56[0.2,1.9]
Birth to pregnancy interval			
<18months	16(8.1%)	1.2[0.67,2.1]	1.7[0.68,4.4]
< 24 months	24(7.6%)	1.1[0.7,1.8]	0.8[0.34,1.87]
≥60 months	29(7.5%)	1.7[0.7,1.7]	1.06[0.45,2.5]
≥72 months	22(8%)	1.2[0.7,1.9]	1.1[0.4,2.72]

5.2.2 – Factors associated with Low Birth Weight

Low Birth weight is reported in 7.2% of cases. Eighteen (11.3%) mothers who gave birth at age of ≥ 35 years have given LBW delivery. Birth to pregnancy interval of less than 18 month and greater than 72 months had high LBW deliveries 18(9%) and 24(9.2%) respectively. Six (11.8%) of mothers of RH negative had given LBW babies. Non-planned deliveries have 9.4% LBW deliveries. 25% of mothers who are known cardiac disease patients have given LBW babies. Mothers who give birth after sustaining complications of pregnancy like APH, PROM and PIH has 32.1%, 5.4%, 21.4% LBW deliveries respectively.

Twenty seven (9.7%) of mothers who are unable to read and write had given LBW. Mothers with secondary education level when compared with unable to read and write were less likely to have LBW with OR 0.5 and 95% CI= [0.2, 0.8]. Muslims when compared to Orthodox followers are less likely to have LBW with OR 95% CI =0.4 [0.22, 0.8].

Mothers who has history of PPH in the preceding delivery and pregnancy complication to current pregnancy with OR 3.5 and 95% CI = [1.2, 10] and OR 4.5 and 95% CI = [2.6, 7.7] respectively has a statistical significant association to LBW.

Planned pregnancies with OR 0.6 and 95% CI = [0.4, 0.97] were significant to LBW, but when adjusted for other variables like other past medical and obstetric history, preceding birth outcome, complication of labor and inter pregnancy interval the association was not significant.

No statistically significant association was observed between Birth to pregnancy interval and Low Birth Weight.

Table 7- Socio-Demographic Characteristics *of low birth weight in Women who give Birth for two or more times in Addis Ababa health institutions from Dec to April 2007*

Variables	Low birth weight (7.2%)		
	Yes N=94	OR 95% CI	Adjusted OR (95% CI)
Age of mother			
15 – 19	1(8.3%)	1.00	1.00
20 – 24	16(7%)	0.8[0.1,6.76]	0.63[0.07,5.6]
25 – 29	42(7.3%)	0.86[0.11,6.8]	0.69[0.08,5.99]
30 - 34	17(5.3%)	0.6[0.07,5.03]	0.5[0.05,4.3]
≥ 35	18(11.3%)	1.4[0.17,11.6]	0.8[0.09,7.5]
Educational status			
Unable to read and write	27(9.7%)	1.00	1.00
Elementary	36(8.5%)	0.9[0.5,1.4]	0.75[0.43,1.3]
Secondary	23(5.1%)	0.5[0.2,0.8]*	0.35[0.18,0.7]*
Tertiary	8(5.6%)	0.5[0.2,1.2]	0.4[0.14,1.1]
Religion			
Orthodox	73(8.5%)	1.00	1.00
Protestant	11(6.5%)	0.8[0.4,1.4]	0.84 [0.41,1.7]
Muslim	10(3.8%)	0.4 [0.22,0.8]*	0.35[0.17,0.71]*
Occupation			
Housewife	68(7.3%)	1.0	1.00
Self employed	19(8.9%)	1.2[0.8,2.1]	1.54[0.9,2.71]
Government employed	6(4.1%)	0.5[0.2,1.2]	0.62[0.22,1.7]

Table 8 – *Past obstetrics history and birth to pregnancy interval of low birth weight observed in Women who give Birth for two or more times in Addis Ababa health institutions from Dec to April 2007*

Variables		LBW (7.2%)		
		Yes N=94	OR 95% CI	Adjusted OR 95% CI
Parity	1	23(6.5%)	1.00	1.00
	2 and 3	63(7.7%)	1.2[0.74,1.98]	1.43[0.8,2.5]
	≥ 4	8(7.3%)	1.13[0.5,2.6]	1.33[0.4,5.3]
Gravidity				
	2 and 3	81(7.5%)	1.00	1.00
	≥4	14(6.3%)	0.9[0.5,1.65]	0.53[0.2,1.5]
Preceding pregnancy outcome				
Pre term		1(7.7%)	1.1[0.1,8.4]	0.4[0.04,3.9]
SVD		88(7.4%)	1.5[0.7,3.5]	1.4[0.6,3.5]
PPH		4(21%)	3.5[1.2,10]*	4.7[1.3,17]*
C/S		6(5%)	0.6[0.3,1.5]	0.7[0.4,1.2]
Current pregnancy				
Current pregnancy planned		53(6.1%)	0.6[0.4,0.97]*	0.72[0.44,1.2]
Contraceptive failure		7(8.9%)	1.3[0.5,3.1]	0.9[0.3,2.3]
Complications to current pregnancy		22(21.4%)	4.5[2.6,7.7]*	6.05[3.3,11]*
RH factor				
Positive		80(6.1%)	1.00	1.00
Negative		6(11.8%)	1.8[0.7,4.4]	1.86[0.71,4.9]
Unknown		8(11.8%)	1.8[0.8,3.9]	1.98[0.84,4.6]
Birth to pregnancy interval				
<18 months		18(9.3%)	1.3[0.8,2.4]	2.5[0.9,6.98]
< 24 months		24(7.8%)	1.1[0.7,1.8]	0.67[0.26,1.7]
≥60 months		29(7.7%)	1.6[0.7,1.7]	0.67[0.25,1.8]
≥72 months		24(9.0%)	1.4[0.8,2.1]	1.76[0.6,4.9]

5.2.3 – Factors associated with still birth

The occurrence of still birth was 3.1%. Fifteen (4.6%) of mothers with the age group 30 -34 have still birth. Muslims have the lowest (0.4%) still birth rate. Government employed had 4.6% still birth rate and both of these associations are not statistically significant.

The maternal age groups where low still birth rate occurred were the age group 25 - 29 and ≥.35 with frequency of 9(1.5%) and 4(2.7%) respectively, this occurrence when compared with maternal age group 15-19 was not significant but when it is adjusted for variables of socio demographic factors, other past medical and obstetric history, preceding birth outcome, complication of labor, current pregnancy outcomes and birth to pregnancy interval is less likely to have still birth with OR 0.05 and 95% CI [0.005,0.55] and OR 0.04 and 95% CI[0.003,0.6] respectively.

Mothers with educational status of elementary and secondary when compared with those who are un able to read and write with OR 0.2 and 95% CI = (0.1, 0.5) and OR 0.4 and 95% CI (0.17, 0.8) respectively are less likely to have still birth. Mothers from Muslim religion compared to Orthodox religion followers with OR 0.1 and 95% CI [0.013, 0.7] were less likely to have still birth.

Birth to pregnancy intervals of >72months has the lowest still birth rate (2.2%). RH negative mothers have 5.9% still birth. All associations are not statistically significant.

Complications of labor have the highest (10.5%) still birth rate, the presence of complications of labor to index (current) pregnancy with OR 5.6 and 95% CI= [2.9, 10] is associated with still birth. Among infants born with congenital malformations 44.4% were stillbirths this result with OR 27 and 95% CI = [7,104] is associated with still birth.

Among those mothers who have pregnancy complications to the current pregnancy 10.7% has ended in still birth, the presence of pregnancy complications to index (current) pregnancy with OR 4.7 and 95% CI = [2.3, 9.7] has statistically significant association with still birth.

From mothers who have known chronic medical problems 8.3% of diabetics, 14.3% of hypertensive and 25% of cardiac patients has experienced still birth. Mothers using narcotics and smokes cigarettes don't have still birth. All these associations are not statistically significant.

No statistically significant association is observed between birth to pregnancy interval and still birth.

Table 9 – *socio demographic characteristics of still birth observed in Women who give Birth for two or more times in Addis Ababa health institutions from Dec to April 2007*

Variables	Still birth (3.1%)		
	Yes N=42	OR (95% CI)	Adjusted OR (95% CI)
Age of mother			
15 – 19	1(8.3%)	1.00	1.00
20 – 24	12(4.7%)	0.54[0.06,4.5]	0.15[0.01,1.66]
25 – 29	9(1.5%)	0.17[0.02,1.45]	0.05[0.005,0.55]*
30 - 34	15(4.6%)	0.53[0.06,4.4]	0.13[0.013,1.5]
≥35	4(2.7%)	0.3[0.03,3.02]	0.04[0.003,0.6]*
Educational status			
Unable to read and write	18(6.2%)	1.00	1.00
Elementary	5(1.2%)	0.2[0.1,0.5]*	0.17[0.06,0.5]*
Secondary	11(2.4%)	0.4[0.17,0.8]*	0.36[0.14,0.9]*
Tertiary	8(5.4%)	0.87[0.4,2.1]	0.73[0.2,2.69]
Religion			
Orthodox	33(3.7%)	1.00	1.00
Protestant	8(4.7%)	1.22(o.6,2.6)	1.5[0.63,3.8]
Muslim	1(0.4%)	0.1[0.013,0.7]*	0.1[0.01,0.77]*
Occupation			
Housewife	29(3.1%)	1.00	1.00
Self employed	5(2.3%)	0.7[0.3,1.9]	0.9[0.3,2.5]
Government employed	7(4.6%)	1.5[0.6,3.5]	1.04[0.3,3.5]

Table 10 - *Past obstetrics history and birth o pregnancy interval of still birth observed in Women who give Birth for two or more times in Addis Ababa health institutions from Dec to April 2007*

Variables	Still birth (3.1%)		
	Yes N=42	**OR 95% CI**	**Adjusted OR 95% CI**
Parity			
1	12(3.4%)	1.00	1.00
2 and 3	25(3%)	0.89[0.44,1.8]	1.32[0.6,3.1]
≥ 4	6(4.4%)	0.53[0.12,2.4]	0.96[0.12,7.76]
Gravidity			
2 and 3	35 (3.2%)	1.00	1.00
≥4	8(3.5%)	0.64[0.23,1.8]	0.92[0.2,4.65]
Preceding pregnancy outcome			
Pre term	1(7.1%)	2.4[0.3,19]	0.4[0.02,8.4]
SVD	40(3.3%)	2.0[0.5,8.4]	2.8[0.6,13.3]
PPH	1(5.3%)	1.7[0.2,13]	1.28[0.13,12]
C/S	2(1.7%)	0.5[0.12,2.1]	-
Current pregnancy			
Current pregnancy planned	23(2.6%)	0.6[0.3,1.2]	0.65[0.3,1.4]
Contraceptive failure	3(3.8%)	1.7[0.5,5.2]	0.89[0.22,3.8]
Complications to current pregnancy	11(10.7%)	4.7[2.3,9.7]*	3.7[1.69,8.02]*
RH factor			
Positive	38(3.1%)	1.00	1.00
Negative	3(5.9%)	1.9[0.6,6.5]	3.4[0.9,12.7]
Unknown	1(1.4%)	0.4[0.1,3.3]	0.4[0.04,3.7]
Compl. of labor	18(10.5%)	5.6[2.9,10]*	4.2[1.76,10]*
Congenital abn.	4(44.4%)	27[7,104]*	20[2.5,164]*
Birth to pregnancy interval			
<18 months	6(3.0%)	0.9[0.4,2.3]	0.6[0.16,2.3]
< 24 months	11(3.5%)	1.1[0.6,2.2]	1.98[0.6,6.3]
≥60 months	11(2.8%)	0.9[0.4,1.7]	1.7[0.54,5.8]
≥72 months	6(2.2%)	0.6[0.3,1.5]	0.37[0.09,1.52]

5.2.4 – Factors associated with birth to pregnancy interval

Mothers with educational status of Tertiary level have the birth to pregnancy interval of <24 months in 34% of the cases and this association with OR 1.8 and 95% CI= [1.15, 2.76] is statistically significant and also this mothers with OR 0.5 and 95% CI= [0.29, 0.78] are less likely to have a birth to pregnancy interval >60 months.

Muslims with OR 0.45 and 95% CI= [0.3, 0.64] are less likely to have a birth to pregnancy interval of >60 months when compared to Orthodox religion followers.

Planned pregnancies when compared to unplanned pregnancy with adjusted OR 0.47 and 95% CI [0.35, 0.6] are less likely to have birth to pregnancy interval of < 24 months and with adjusted OR 1.43 and 95% CI= [1.1, 1.9] has a statistically significant association with birth to pregnancy interval of >60 months.

Mothers who give birth through C/S in their previous delivery with OR 0.5 and [95% CI= 0.26, 0.8] is less likely to have birth to pregnancy interval of <24 months and also with OR 0.5 and 95% CI = [0.4, 0.9] are less likely to have >60 months birth to pregnancy interval. And mothers whose previous mode of delivery was in SVD with OR 2.2 and 95% CI = [1.2, 3.8] has significant association with birth to pregnancy interval of <24 months and with OR 1.8 and 95% CI = [1.1, 2.8] is also associated with birth to pregnancy interval of >60 months.

Those with previous mode of delivery C/S has birth to pregnancy interval between 24 and 60 months while with SVD has either less than 24 or greater than 60 month interval.

Mothers who has a known chronic medical problem with OR 1.9 and 95 % CI = [1.06, 3.7] has seen to have a birth to pregnancy interval of <24 months but when this variable was adjusted with other variables like maternal socio demographic factors preceding mode of delivery and sex of baby and history of chronic medical problem it is found to be non significant.

Mothers with parity 2 & 3 with OR 0.7 and 95% CI [0.5,0.94] are less likely to have birth to pregnancy interval of < 24 months. While mothers with ≥ 4 parity with OR 1.98 and 95% CI [1.3,3.02] have statistical significant association to birth to pregnancy interval of > 60 months but when it was adjusted for other socio-demographic, past obstetrics and medical history it is non significant.

Preceding baby sex has no difference in birth to pregnancy interval occurrence.

Table 11 - Association of *Birth to pregnancy interval to maternal socio-demographic situation among women who delivered for two and more times in Addis Ababa at health institutions from December – April 2007.*

Variables	**Birth to pregnancy interval <24 month (23.9%) N=316**	**OR (95% CI)**	**Adjusted OR (95% CI)**
Age of mother			
15 – 19	3(27.3%)	1.00	1.00
20 – 24	71(27.7%)	1.02[0.3,3.9]	0.8[0.2,3.1]
25 – 29	139(24%)	0.8[0.2,3.2]	0.64[0.16,2.55]
30 - 34	66(20.6%)	0.7[0.2,2.6]	0.49[0.12,2.01]
≥35	37(24.1%)	0.8[0.2,3.3]	0.59[0.14,2.4]
Educational status			
Unable to read and write	65(22.6%)	1.00	1.00
Elementary			1.1[0.76,1.7]
Secondary	95(22.3%)	0.98[0.7,1.4]	1.3[0.88,1.9]
Tertiary	105(23%)	1.02[0.7,1.44]	2.6[1.52,4.4]*
	50(34.2%)	1.8[1.15,2.76]*	
Religion			
Orthodox			1.00
Protestant	203(23.1%)	1.00	0.98[0.7,1.5]
Muslim	42(24.4%)	1.07[0.7,1.6]	1.26[0.9,1.77]
	68(25.9%)	1.2[0.8,1.6]	
Occupation			
House wife			1.00
Self employed	222(23.7%)	1.00	1.03[0.7,1.5]
Government employed	52(24.1%)	1.02[0.7,1.4]	0.89[0.6,1.43]
	40(26.5%)	1.2[0.8,1.7]	
Current pregnancy planned -Yes	175(20.1%)	1.1[0.8,1.4]	0.47[0.35,0.6]*
Preceding pregnancy mode of delivery -C/S	39(32%)	0.5[0.26,0.8]*	1.65[1.07,2.54]*
-SVD	277(23%)	2.2[1.2,3.8]*	-
Chronic medical illness – yes(42)	10(23.8%)	1.9[1.06,3.7]*	0.92[0.43,1.96]
Sex of preceding baby-Male	166(23.5%)	1.00	1.00
Female	147(23.9%)	1.02[0.8,1.3]	1.03[0.79,1.36]
Parity 1	100 (28.5%)	1.00	1.00
2&3	183(22%)	0.7[0.5,0.94]*	0.73[0.54,0.99]*
≥ 4	32(24.1%)	0.7[0.5,1.26]	0.77[0.45,1.3]

Table 12 - *Association* of *Birth to pregnancy interval to maternal socio-demographic situation among women who delivered for two and more times in Addis Ababa at health institutions from December – April 2007.*

Variables	**Birth to pregnancy interval >60 month (29.2%) N=388**	**OR(95% CI)**	**Adjusted OR (95% CI)**
Age of mother			
15–19	1(9.1%)	1.00	1.00
20–24	48(18.8%)	2.2[0.3,18]	2.1[0.3,16.8]
25–29	158(27.3%)	3.7[0.5,29]	3.6[0.45,28.7]
30-34	110(34.4%)	5.2[0.7,40]	4.8[0.6,39.1]
≥ 35	61(42.1%)	7.2[0.9,57]	7.2[0.9,59]
Educational status			
Unable to read and write	87(30.3%)	1.00	1.00
Elementary	122(28.6%)	0.9[0.7,1.3]	0.8[0.6,1.19]
Secondary	150(32.8%)	1.12[0.82,1.5]	0.89[0.6,1.27]
Tertiary	25(17.1%)	0.5[0.29,0.78]*	0.36[0.2,0.65]*
Religion			
Orthodox	285(32.5%)	1.00	1.00
Protestant	50(29.1%)	0.85[0.59,1.2]	1.01[0.69,1.5]
Muslim	47(17.9%)	0.45[0.3,0.64]*	0.45[0.3,0.64]*
Occupation			
House wife	279(29.8%)	1.00	1.00
Self employed	62(28.7%)	0.95[0.7,1.3]	0.96[0.68,1.35]
Government employed	38(25.2%)	0.79[0.5,1.17]	0.98[0.6,1.6]
Current pregnancy planned -Yes	265(30.4%)	1.2[0.9,1.5]	1.43[1.1,1.9]*
Preceding pregnancy mode of delivery -C/S	24(19.7%)	0.5[0.4,0.9]*	0.53[0.32,0.87]*
-SVD	363(30.3%)	1.8[1.1,2.8]*	-
Chronic medical illness - yes	18(41.8%)	1.8[0.99,3.47]	1.6[0.8,3.1]
Sex of preceding baby-Male	206(29.2%)	1.00	1.00
- Female	182(29.6%)	1.02[0.8,1.3]	1.04[0.81,1.34]
Parity 1	86(24.5%)	1.00	1.00
2&3	246(29.6%)	1.3[0.97,1.7]	1.25[0.9,1.7]
≥ 4	52(39.1%)	1.98[1.3,3.02]*	1.4[0.86,2.3]

6. DISCUSSION

In this study it was found that the mean birth to pregnancy interval is 45.9± 27.3 months (95% CI 44.4, 47.3). This finding was consistent with the finding from DHS 2005 for Addis Ababa which says 45.2 months. [32] About 6.5 % has a birth interval less than 18 months while in DHS 2000 it is 8% and 23.9% of non first pregnancy occurs less than 24 months and in DHS 2000 it was 20%. [17] The mean birth to pregnancy interval in Addis Ababa is generally higher when compared to other developing countries which are three years (36 months). [19]

The characteristics of study subjects in this study in terms of religion, literacy and ethnicity composition was comparable to the DHS 2005 data for Addis Ababa.

This may happen because the total wanted fertility for Addis Ababa according to DHS Ethiopia 2005 is 1.2. This figure shows that women in Addis Ababa tend to have small family size therefore need to space their child could be there which affects the birth to pregnancy interval.

From our study we have also seen that birth to pregnancy interval that happens following planned pregnancies have 1.4 times more chance to occur in greater than 60 months than unplanned pregnancies. This tells us that if pregnancies had happened according to the plan of mothers most pregnancies in Addis Ababa occur in long intervals.

Generally short birth to pregnancy interval (<24 months) is influenced by mothers educational status of tertiary education level, having previous mode of delivery through C/S and having

chronic medical problem. Long birth to pregnancy interval (>60 months) is also influenced by planned pregnancy and preceding birth delivered through SVD. Though the DHS Ethiopia 2005 finding reveals that there is a significant increase in the median number of months as maternal age increases [31] but our finding is not consistent with that and there is no association seen.

According to the report of DHS Ethiopia 2005 there is no substantial difference in length of median birth interval by sex of preceding baby. This finding was consistent to our study and we have seen no significant relationship between sex of preceding baby and birth to pregnancy interval.

Mothers with tertiary education level have a significant short birth to pregnancy interval. This finding may contradict to the fact that as education increases the desire to limit family size increases. But, the relation between short birth to pregnancy interval and higher maternal education might be explained by; First, the presence of short birth to pregnancy interval might not necessarily reflect big family size. This study has used data from two consecutive births only and this data doesn't show the entire birth interval trend. The second reason might be that women who were busy in schooling definitely get older before getting married and have their family. These women when realize this fact urges to meet their desired family size so soon before their age become too late and will have short birth to pregnancy interval.

Birth to pregnancy interval has been seen non significant for adverse perinatal outcomes. This finding may contradict from other similar studies done in St. paul's and black lion hospital in Ethiopia which says conceiving within 12 months of previous delivery is a critical interval to cause low birth weight.[18] But the finding of this study is consistent with findings from some

other countries where they stated that birth to pregnancy interval has no association in causing preterm birth in Brazil, [25] In Sweden the association between birth to pregnancy interval and still birth is confounded by maternal socio demographic status.[28] and a study done in Boston (USA) says there is no relation between inter pregnancy interval and risk of preterm birth. [26]

In this study it is observed that factors like having PPH in the preceding delivery and complications of pregnancy & labor to current pregnancy contribute to poor perinatal outcome than birth to pregnancy interval. This finding was almost found to be a universal fact and has been revealed in many literatures and texts. [1, 21, 22, 23]

Having a preterm birth in the preceding delivery has no effect in poor perinatal outcomes and this finding is not consistent from other findings that states: It is generally accepted that there is a tendency to repeat adverse pregnancy outcomes, such as stillbirth, early neonatal death, preterm delivery, or delivery of a small for gestational age infant [28].

The rate of poor perinatal outcomes i.e. premature delivery and LBW are almost consistent with other studies done in Ethiopia. [6, 7] But the findings from this study have shown low rate in LBW and prematurity as compared to the Addis Ababa health bureau 1998 EC annual report. [10] This might happen because this study has used primary data in health facility level that decreases non response bias and avoids missing data. Additionally this study is limited to deliveries happening for second time and above; it excludes primipara.

The rate of still birth in this study is consistent with other findings which says, the still birth rate in less developed countries could exceed 3%. [12] But, much higher than the DHS 2005 report

which says 1.8%, also from other study done in Ethiopia which reveal 1.9% still birth rate [4] and the Addis Ababa health bureau 1998 EC report 2.5%. [10] But also very smaller when compared with another study conducted in Black lion hospital with rate of 5.3%.[13] This may happen because in DHS data is collected by interview technique which creates a recall bias and social desirability bias, culturally most mothers don't want to remember and mention their lost child creating under reporting of still births. This study uses primary data and there is no chance of under reporting.

While in the black lion hospital case; it is a hospital where most complicated cases are referred to it as a result to get higher still birth rate in Black lion hospital might not be strange thing, this study uses data from health centers and it will dilute the still birth report from hospitals. In this study also 53% of still births are reported from government hospitals.

7. CONCLUSION

- The rate of pre term birth, low birth weight and still birth among mothers who give birth for second time and above in Addis Ababa is 7.1%, 7.2% and 3.1% respectively.

- Birth to pregnancy interval has no association with poor perinatal outcomes (still birth, LBW and prematurity).

– Complication to the index labor attributes to poor perinatal outcomes than birth to pregnancy interval.

- Prematurity and LBW – influenced by complication to current pregnancy and PPH in the preceding labor.

- Still birth – influenced by maternal age >25 years, maternal educational status, religion, complication of pregnancy & labor and presence of congenital malformations to the fetus.

- Birth to pregnancy intervals are generally influenced by maternal education level, parity, preceding birth mode of delivery and planned pregnancy.

8. RECOMMENDATIONS –

- Upgrading health institutions both in personnel and logistics to a level to be able to identify and treat pregnancy and labor complications.

- This study is only limited to selected perinatal outcomes. Further study on the effect of birth to pregnancy interval to early neonatal death and maternal well being has to be studied.

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10. ANNEX

10.1 - Annex 1 –Questionnaire (English)

A Questionnaire prepared to collect data on birth to pregnancy interval and its effect in perinatal outcomes in Addis Ababa.

Questionnaire Number _____

Hello! Good morning/ evening?

My name is Sr. / Ato_____ I am working in this health institution.

Now I am a research team member of Addis Ababa University. I am here today to collect data on birth to pregnancy interval and perinatal outcomes in Addis Ababa. The objective of this questionnaire is to see or identify birth to pregnancy interval and its birth outcome in Addis Ababa. We collect data from mothers who are giving birth at least for the second time. The questions are simple and focus only in your status, past medical, obstetric and medical history.

I assure you that the study is confidential. I will not keep a record of your name and address. You have a right to stop the interview at any time, or to skip any question that you do not want to answer. By doing so you will face no other problem or the care that is given to you will not be changed in any form. But, your correct answer to the questions can make the study achieve the goals. Therefore, you are kindly requested to respond genuinely and voluntarily with patience. The interview may take about 10 minutes.

Do you have any question?

Are you willing to participate in the interview?

[ ] Yes, Go to the next page

[ ] No, Thank them and interrupt the interview

Name and Sign of the consenting interviewer_____

Result of the interview: 1. Completed 2. Partially completed

3. The interviewee refused 4. Others_____

Supervisor's name_____ sign _____

Time interview started _____ Time interview Finished_____

Name of institution data collected_____

Date _____

Questionnaire - Part one – socio demographic characteristics of the mother

No	Questions	Response	Skip
001	Age the mother in years	[_ _]	
002	Marital status	Married _ 1 Divorced – 2 Widowed – 3 Single- 4 other – 99	
003	Educational status	Un able to read and write – 1 Read and write only - 2 Elementary – 3 Secondary – 4 TVET – 5 Preparatory – 6 Tertiary – 7 other _____ – 99	
004	Religion	Orthodox – 1 Protestant – 2 Catholic – 3 Moslem – 4 Other _____ – 99	
005	ethnicity	Amhara – 1 Oromo – 2 Gurage – 3 Tigre – 4 Other _____ - 99	
006	Occupation	House wife – 1 Merchant – 2 Small scale business – 3 Daily laborer - 4 Food and drink seller – 5 Teacher – 6 Police – 7 Office worker – 8 Retired – 9 Handcraft – 10 Student – 11 Health professional – 12 Un employed – 13 Other _____ - 14	
007	Employment	Government – 1 Private organization – 2 NGO -3 Private organization owner -4 Working in family business – 5 No permanent income – 6 Other _____ - 7	
008	In come per month	Personal income [_ _ _ _] Husband's[_ _ _ _] Other means[_ _ _ _] Total [_ _ _ _]	

Part two – past medical, obstetric and gynecologic history

No.	Question	Response	Skip
101	The first day of the Last menstrual period	dd/m/y [__ __ __]	
102	Gestation in weeks.	[__ __]	
103	Date of live birth given preceding to this pregnancy.	dd/m/y [__ __ __]	
104	Inter pregnancy interval in months	[__ __]	
105	Parity	[__ __]	
106	Gravidity	[__ __]	
107	Is the current pregnancy planned (wanted)?	Yes – 1 No - 2	Skip to No 109
108	If No, What was the reason?	Accidental – 1 Contraceptive failure – 2 Rape – 3 Other _____ - 99	
109	Does the current pregnancy have complications?	Yes – 1 No - 2	Skip to No 111
110	If Yes, what type?	APH – 1 Poly hydraminos – 2 Cervical incompetence – 3 PIH – 4 PROM – 5 Multi fetal gestation – 6 Other _____ 99	
111	What was the preceding pregnancy and labor out comes? (*multiple responses are possible*)	Yes No 1-Live birth 1 2 2-Still birth 1 2 3-Pre term birth 1 2 4 C/S - 1 2 5- PPH 1 2 6- SVD 1 2 Other _____ 99	
112	Sex of the preceding baby.	Male – 1 Female - 2	
113	Was she taking contraceptives to current pregnancy	Yes – 1 No - 2	to 117

114	If yes, how many months before this pregnancy did she discontinued?	[___ ___]-1 She is pregnant while taking the contraceptive - 2	
115	If yes, For how long did she take? *In months*	[___ ___]	
116	If yes, What type of contraceptive was she taking? (*last time used)*	OCP- 1 Depo provera _ 2 Norplant – 3 IUCD _ 4 Others _____ 5	
117	Does the mother have history of chronic medical illness?	Yes – 1 No – 2	Skip to No 119
118	If yes, what are the problems? (*multiple responses are possible*)	Yes No 1-Diabetes mellitus 1 2 2-Hypertension 1 2 3-Cardiac disease 1 2 Other _____ 99	
119	Did the mother Has history of drug use? (cocaine, mariwana ...)	Yes – 1 No – 2	Skip to No 123
120	Is she still using?	Yes – 1 No – 2	to 122
121	If yes, for how long?	[__ __]	
122	If No, how many years since she stops	[__ ___]	
123	Did the mother Has history of cigarette smoking?	Yes – 1 No - 2	Skip to No 128
124	If Yes, Is she still using?	Yes – 1 No - 2	to 127
125	If Yes, For how long?	[__ __]	
126	If Yes, how many cigarettes per day?	[__ __]	
127	If No, how many years since she stops	[___ ___]	
128	RH factor of the mother	Positive – 1 Negative – 2 Un known - 3	

Part Three – Birth out comes and situation of current pregnancy

No.	Question	Response	Skip
201	Does the current labor have any problem or complication?	Yes – 1 No - 2	 Skip to 203
202	If yes , what type	Prolonged labor – 1 Malposition or malpresentation -2 Obstructed labor - 3 Other specify _____-99	
203	Method of delivery	Vaginal (with or without episiotomy) – 1 Cisarean Section – 2 Instrumental – 3 Augmentation or induction - 4 Other _____ 99	
204	Is the child born alive?	Yes – 1 No – 2	 Skip to 209
205	Sex of the baby	Male – 1 Female – 2	
206	Weight of baby in Gram	[__ __ __ __]	
207	Percentile of weight to gestational age	[__ __]	
208	APGAR score with in five minutes	[__]	
209	Does the new born baby have congenital abnormalities?	Yes – 1 No - 2	
210	If Yes, What type?	1. _____ 2. _____ 3. _____	

Signature of supervisor _____

Date_____

10.2 - Annex 2 – Amharic questionnaire

በእርግዝናዎች መካከል ያስ ርዝመት/ርቀት በተከታይ በሚወለዱ ህጻናት ላይ ያለው ተጽዕኖና የሚያመጣው ውጤት በአዲስ አበባ ምን መልክ እንዳለው ለማየት የሚደረግ ጥናት መጠይቅ

የመጠይቅ ቁጥር _____

እንደምን አደሩ/ ዋሉ/ አመሹ ?

የኔ ስም_____ **ይባላል። የምሰራው በዚህ ጤና ድርጅት/ሆስፒታል ውስጥ ሆኖ አሁን በተለይ በአዲስ አበባ ዩኒቨርሲቲ የህክምና ፋከልቲ ለሚካሄድ ጥናት ይህን መረጃ በመሰብሰብ ላይ እገኛለሁ። የጥናቱ አላማ በእርግዝናዎች መካከል ያለ ርዝመት/ርቀት በተከታይ በሚወለዱ ህጻናት ላይ ያለው ተጽዕኖና የሚያመጣው ውጤት በአዲስ አበባ ምን መልክ እንዳለው ለማወቅ/ለመረዳት የሚደረግ ነው። መረጃው የሚሰበሰበው ቢያንስ ለሁለተኛ ጊዜ እየወለዱ ካሉ እናቶች ላይ ነው። ጥያቄዎቹ ቀላልና በእርስዎ አጠቃላይ ጤንነት እንዲሁም ያለፉት የእርግዝና ታሪኮችና ውጤቶች ላይ ያተኮሩ ናቸው።**

የሚሰጡን መረጃ ሙሉ በሙሉ በሚስጥር ይጠበቃል፤ለዚህ ጥናት አላማም ብቻ ይውላል፤ከጥናቱ ቡድን ውጭ ለሌላ ሶስተኛ አካል ተላልፎ አይሰጥም። በመረጃው ላይ ስምዎትና አድራሻዎት አይጠቀስም።

ከጥያቄዎቹ *መካከል መመለስ የማይፈልጉት ካለ ያለመመለስ* መብት አለዎት። እንዲሁም አጠቃላይ መጠይቁን ማቋረጥ ከፈለጉም ያንን ማድረግ ይችላሉ። ይህን በማድረግዎ ከጤና ድርጅቱ/ ሆስፒታሉ በሚያገኙት እርዳታ ወይም እንክብካቤ ላይ ምንም ተጽእኖ አይኖረውም። ነገር ግን በጥናቱ ቢሳተፉና ትክክለኛ መልስ ቢሰጡን ጥናቱ የተነሳለትን አላማ ከግቡ እንዲያደርስ ትልቅ አስተዋጽኦ ይኖረዋል። በመሆኑም በጥናቱ ላይ በቅንነትና በሙሉ ፍላጎት/ፈቃደኝነት እንዲሳተፉልን በአክብሮት እንጠይቃለን። መጠይቁ በአማካይ 10 ደቂቃ የሚፈጅ ነው።

ወደ መጠይቁ ከማለፋችን በፊት ጥያቄ አለዎት?
በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት?

ሀ. አዎ --- ይህን ካሉ ወደሚቀጥለው ገጽ ይለፉ።
ለ. አይደለሁም ---- ***ይህን ካሉ አመሰግነው መጠይቁን ያቋርጡ።***

መጠይቁን የሞላው/የሞላችው ባለሙያ ስም_____
ፊርማ _____

<u>የ</u>መጠይቁ ውጤት
1. ሙሉ በሙሉ የተጠናቀቀ
2. በከፊል የተጠናቀቀ
3. ተጠያቂዋ ባለመስማማታቸው ያልተሞላ
4. ሌላ ይጠቀስ _____
መጠይቁ መሞላት የተጀመረበት ሰአት_____
መጠይቁ የተጠናቀቀበት ሰአት_____
መጠይቁ የተሰራበት ጤና ድርጅት _____

ቀን _____

Part one – socio demographic characteristics of the mother

No.	Questions	Response	Skip
001	ዕድሜ	[_ _]	
002	የጋብቻ ሁኔታ	ያገባች_ 1 የፈታች – 2 የሞተባት – 3 ያላገባች- 4 ሌላ ይጠቀስ _____ – 99	
003	የትምህርት ደረጃ	ማንበብና መጻፍ የማትችል – 1 ማንበብና መጻፍ ብቻ የምትችል –2 አንደኛ ደርጃ – 3 ሁለተኛ ደረጃ – 4 ቴክኒክና ሙያ – 5 መሰናዶ – 6 ከፍተኛ ትምህርት የተማረች /በመማር ላይ ያለች/-7 ሌላ ይጠቀስ _____ – 99	
004	ኃይማኖት	ኦርቶዶክስ – 1 ፕሮቴስታንት – 2 ካቶሊክ – 3 ሙስሊም – 4 ሌላ ይጠቀስ _____ –99	
005	ብሔር	አማራ - 1 ኦሮሞ - 2 ጉራጌ - 3 ትግሬ - 4 ሌላ ይጠቀስ_____ - 99	
006	ሥራ (መተዳደሪያ)	የቤት እመቤት – 1 ነጋዴ – 2 ጥቃቅንና አነስተኛ ንግድ – 3 የቀን ሰራተኛ - 4 ምግብና መጠጥ ሻጭ – 5 አስተማሪ - 6 ፖሊስ - 7 የቢሮ ሰራተኛ - 8 ጡረተኛ - 9 የዕደ ጥበብ ባለሙያ - 10 ተማሪ - 11 ጤና ባለሙያ - 12 ስራ የሌላት - 13 ሌላ ይጠቀስ _____ - 99	
007	ሥራዎትን የሚሰሩት በተቀጣሪነት ወይስ በግል ነው?	የመንግስት ተቀጣሪ - 1 ግል ድርጅት ተቀጣሪ - 2 መንግስታዊ ያልሆነ ድርጅት ተቀጣሪ - 3 የግል ድርጅት ባለቤት - 4 የቤተሰብ ድርጅት ውስጥ አገልጋይ - 5 ቋሚ ገቢ የሌላት - 6 ሌላ ይጠቀስ_ _____99	
008	ወርሃዊ ገቢዎት በብር ሲገመት /ሲገለፅ/ ስንት ይሆናል ?	የግልዎ[_ _ _ _ _] የባለቤትዎ[_ _ _ _ _] ሌላ ተጨማሪ ገቢ [_ _ _ _ _] ጠቅላላ የገቢ ድምር [__ __ __ __]	

Part two – Past medical, obstetric and gynecologic history

No.	Question	Response	Skip
101	**ለመጨረሻ ጊዜ ያዩት የወር አበባ መፍሰስ የጀመረበት ቀን** (The first day of the LMP)	**ቀን/ወር/ዓ.ም** [__ __ __]	
102	**የእርግዝናው እድሜ በሳምንታት** (Gestation in weeks.)	[__ __]	
103	**ከዚህ እርግዝና በፊት የነበረዎት በህይወት የተወለደ ልጅ የተወለደበት ቀን** (Date of live birth given preceding to this pregnancy.)	**ቀን/ወር/ዓ.ም** [__ __ __]	
104	Inter pregnancy interval in months	[__ __]	
105	Parity	[__ __]	
106	Gravidity	[__ __]	
107	**የአሁኑ እርግዝና ያቀዱት ወይም ፈልገውት የተከሰተ ነው ?** Is the current pregnancy planned (wanted)?	**አዎ** – 1 **አይደለም** - 2	Skip to No 109
108	**አይደለም ካሉ እርግዝናው እንዴትና በምን ሁኔታ ሊከሰት ቻለ?**	**በአጋጣሚ** – 1 Contraceptive failure – 2 Rape – 3 Other _____ - 99	
109	Does the current pregnancy have complications?	Yes – 1 No - 2	Skip to No 111
110	If Yes, what type?	APH – 1 Poly hydraminos – 2 Cervical incompetence – 3 PIH – 4 PROM – 5 Multi fetal gestation – 6 Hyper emesis - 7 Other _____ 99	
111	What was the preceding pregnancy and labor out comes? **(ከአሁኑ እርግዝና በፊት የነበረዎት እርግዝናና ምጥ ውጤቱ ምን ነበር?)** (*multiple responses are possible ከአንድ በላይ መልስ ይቻላል*)	Yes No 1-Live birth 1 2 2-Still birth 1 2 3-Pre term birth 1 2 4 C/S 1 2 5- PPH 1 2 6- SVD 1 2 Other _____ 99	
112	**ከዚህ እርግዝና በፊት የወለዱት ልጅ ጸታ ምንድን ነው?** (Sex of the preceding baby)	**ወንድ** – 1 **ሴት** - 2	
113	**የወሊድ መከላከያ በዚህ እርግዝና ተጠቅመው ያውቃሉ ?**	**አዎ** – 1 **አላውቅም** - 2	Skip to 117

114	**አዎ ካሉ ፡ ይህ እርግዝና ከመከሰቱ ከስንት ጊዜ በፊት የወሊድ መከላከያውን አቆሙ/ አቋረጡ ? /**	[___ ___]-1 She is pregnant while taking the contraceptive - 2	
115	**አዎ ካሉ የወሊድ መከላከያውን ለምን ያህል ጊዜ ወሰዱ/ ተጠቀሙ?**	[___ ___]	
116	**አዎ ካሉ ምን አይነት የወሊድ መከላከያ ነበር የተጠቀሙት**? *(ለመጨረሻ ጊዜ የተጠቀሙትን ይግለጹ)*	OCP- 1 Depo provera _ 2 Norplant – 3 IUCD _ 4 Others _____5	
117	**የቆየና የሚታወቅ የጤና ችግር አለብዎት?** Does you have history of chronic medical illness?	**አዎ - 1** **የለም** - 2	Skip to No 119
118	**አዎ ካሉ ምን አይነት የጤና ችግር?** If yes, what are the problems? *(Multiple responses are possible. ከአንድ በላይ መልስ ይቻላል*)	Yes No 1-Diabetes mellitus 1 2 2-Hypertension 1 2 3-Cardiac disease 1 2 4- pul. Tuberculosis 1 2 Other _____ 99	
119	**የአደንዛዥ ዕፅ ወይም ሱስ አምጭ መድሃኒት ተጠቅመው ያውቃሉ?** (cocaine, mariwana ...)	**አዎ** – 1 **አላውቅም** – 2	Skip to 123
120	**አዎ ካሉ ፧ አሁንም እየተጠቀሙ ነው?**	**አዎ** – 1 **አልጠቀምም** – 2	Skip to 122
121	**አዎ ካሉ ፧ ለምን ያህል ጊዜ ተጠቀሙ ?**	[__ __]	
122	**አሁን አልጠቀምም ካሉ ፡ መጠቀም ካቆሙ ስንት ጊዜ ሆነዎት?**	[__ ___]	
123	**ሲጋራ ወይም ሺሻ አጭሰው ያውቃሉ** ?	**አዎ** – 1 **አላውቅም** - 2	Skip to 128
124	**አዎ ካሉ ፧ አሁንም እያጨሱ ነው** ?	**አዎ** – 1 **አይደለም** - 2	Skip to 127
125	**አዎ ካሉ ፧ለምን ያክል ጊዜ አጨሱ** ?	[__ __]	
126	**አዎ ካሉ ፧ በቀን ምን ያክል ሲጋራ ወይም ሺሻ ያጨሳሉ ?**	[__ __]	
127	**አሁን አላጨስም ካሉ ፡ ማጨስ ካቆሙ ስንት ጊዜ ሆነዎት?**	[___ ___]	
128	RH factor of the mother	Positive – 1 Negative – 2 Un known – 3	

Part Three – Birth out comes and situation of current pregnancy

No.	Question	Response	Skip
201	Does the current labor have any problem or complication?	Yes – 1 No - 2	Skip to 203
202	If yes , what type	Prolonged labor – 1 Malposition or malpresentation -2 Obstructed labor - 3 Other specify _____-99	
203	Method of delivery	Vaginal (with or without episiotomy) – 1 Cisarean Section – 2 Instrumental – 3 Augmentation or induction - 4 Other _____ 99	
204	Is the child born alive?	Yes – 1 No – 2	Skip to 209
205	Sex of the baby	Male – 1 Female – 2	
206	Weight of baby in Gram	[__ __ __ __]	
207	Percentile of weight to gestational age	[__ __]	
208	APGAR score with in five minutes	[__]	
209	Does the new born baby have congenital abnormalities?	Yes – 1 No - 2	
210	If Yes, What type?	4. _____ 5. _____ 6. _____	

የተቆጣጣሪው/ዋ ፊርማ _____

ቀን_____