ADDIS ABABA UNIVERSITY

COLLAGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF THE PREVALENCE AND ASSOCIATED FACTORS OF BIRTH PREPAREDNESS AND COMPLICATION READINESS AMONG PREGNANT W0MEN IN PUBLIC HEALTH CENTERS OF ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH IN REPRODUCTIVE AND FAMILY HEALTH

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Addis Ababa, Ethiopia

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List of Abbreviations

ANC- Ante Natal Care

BP/CR- Birth Preparedness and Complication Readiness

EDHS- Ethiopian Demographical Health Survey

FIGO- Federation of Gynecology and Obstetrics

FMOH- Federal ministry of health

HSTP- Health Sector Transformation Plan

MDG- Millennium Developmental Goal

MMR- Maternal Mortality Ratio

SSA- Sub-Saharan Africa

SDG – Sustainable Developmental Goal

WHO - World Health Organization

Abstract

Background; - Ethiopia is one of the countries with higher maternal mortality in the world that was estimated 11,000 in 2015 alone. Birth preparedness and complication readiness (BPCR) is important measure to improve utilization of maternal health which contributes for reducing maternal mortality. BPCR is a comprehensive package aimed at promoting timely access to skilled maternal and neonatal services. But limited study was found in Addis Ababa on BP/CR

Objective: - To determine the prevalence and associated factors of birth preparedness and complication readiness among pregnant women in public health centers in Addis Ababa

Method: - Facility based cross-sectional study was done in selected ten health centers in Addis Ababa. Multistage sampling technique was used to select health facilities by taking clients flow chart into account. Training was given to the data collectors prior to data collection. There were ten data collectors and two supervisors. Data was collected from March to April 2019 using structured questioner which was pretested in other health center. Then data was entered to Epi-data software version 3.1 by the principal investigator and SPSS 20 software program was used to analyze the entered data. OR were used to measure association and 95% CI and P-Value<0.05 were used as predictors of significant association. Binary and multivariable logistic regression was tatted.

Result: - A total of 633 pregnant mothers were participated in the study. 322 (50.9%) of the participants were prepared for birth and ready for complication management. Mothers who came for ANC follow up and have ultrasound were found to be 98.3%. Government employee mothers (AOR=2.29 1.03, 5.09), educated mothers secondary (AOR=2.459; 1.002, 5.038), preparatory (AOR=3.254; 1.245, 8.506) and tertiary (AOR= 3.001; 1.173, 7.679), decision making power (AOR=0.56: 0.33, 0.95), and counseling on danger sign (AOR=1.78; 1.196 2.65), and counseling on birth preparedness complication readiness during ANC visit (AOR=1.395; 1.90, 2.16) had found significantly associated with birth preparedness complication readiness.

Conclusion and recommendation: - Birth preparedness and complication readiness was low among study participants. Even if there were higher prevalence of ultrasound, Most birth prepared and complication ready mothers were those who were counseled. I suggest health providers to give more attention on counseling on danger sign and birth preparedness and complication readiness

1. Introduction

1.1. Background

Globally, an estimated, 303,000 women died in 2015 from complications during pregnancy and child birth [1]. The developing world continues bearing a disproportionately high burden of maternal mortality, with Sub-Saharan Africa (SSA) alone contributed a whopping 66% [1]. Women's life time risk of death during child birth is 1 in 39 in SSA which is unacceptably high compared to that of women In the developed world with1in 3,800 [2].

With an average of 11,000 maternal deaths in 2015 alone, Ethiopia is positioned among the ten high maternal mortality burden countries which represent nearly 60% of the global maternal deaths [1]. By the deadline of Millennium Development Goal (MDG), Ethiopia fell short of hitting the fifth MDG which was reducing maternal mortality ratio by three-quarter between 1990-2015, though the achievement was remarkable [3].

As time of labor or time of emergency is not the time to decide what to do. The time required to make arrangements, which could have been made prior to the emergency, may define the line between survival and mortality.[4]

Main reason for maternal death can be categorized in to three types of delays based on Thaddeus and Maine explanatory modal named as delay in seeking care, delay in reaching care, and delay in receiving adequate care [4].

Anything that cause delay in getting treatment may cost women's life. These delays can be prevented by Birth-preparedness and complication- readiness (BPCR) allows a pregnant woman and her family to plan ahead, so that they can have safe and healthy pregnancy and delivery [5].

Birth preparedness and complication readiness is a strategy to promote the timely use of skilled maternal and neonatal care, especially during childbirth. Based on the theory that preparing for childbirth, and being ready for complications reduces delays in obtaining this care.[6]

Many more women and newborns would survive childbirth if they received the care they need when they need it [7]. Making a birth plan before and during pregnancy has shown to facilitate a feeling of self-control and autonomy for pregnant women which in-turn positively influences pregnancy and birth outcomes [8].

BPCR is a comprehensive package aimed at promoting timely access to skilled maternal and neonatal services [6]. The birth-preparedness package promotes active preparation and decision-making for delivery by pregnant women and their families [9]. BPCR is an important measure to improve utilization of maternal health services by planning for normal birth and predicting actions needed in case of emergency [6]. The issue of BPCR can be addressed by a tool, which containing :- knowledge of danger signs, plan for place of birth; plan for a skilled birth attendant, plan for transportation and plan for saving money and plan for blood donor as a key elements [6]

WHO recommends that all pregnant women have a written plan for dealing with birth and any unexpected adverse events, such as complications or emergencies that may occur during pregnancy, childbirth or the immediate postnatal period [10]. The government of Ethiopia started implementing birth-preparedness and complication readiness package as one component of focused antenatal care since 2007 to enable pregnant woman get timely care during child birth and in case of emergency[11].

1.2 Statement of the problem

According to SDG the annual rate set for redaction of MMR should be 7.5% starting from 2016 in order to accomplish the target goal which is higher than 5.5 in MDG which we can't achieve [3]. As these point accelerating and continues progress requiring additional interventions is urgently needed in most countries including Ethiopia [3].

BPCR is recommended interventions as essential element of ANC to prevent maternal death [8]. According to Ethiopia demographic health survey (EDHS) 2016 report among women who received antenatal care (ANC) for their most recent live birth in the past 5 years, 56% were informed about a birth preparedness plan. Eighty seven percent of women were informed about place of birth, 39% about supplies needed for giving birth, 20% about emergency transportation, 19% about an emergency fund or money, 5% about support during and after birth, and 3% about potential blood donors [12].

Majority of maternal deaths relate with pregnancy, delivery, and within 24 h post-partum. There are numerous determinant sociocultural factors, apart from medical causes, that which delay care-seeking and contribute to these deaths. [6]

Providing of a skilled care provider during pregnancy and childbirth has been identified as the greatest involvement to decrease complications and maternal death. About 99% of all maternal deaths occur in the developing countries. [7]

The role of ultrasound in the developing world during pregnancy has been controversial with several investigators concluding that it provides only a modest benefit not felt to be worth the cost of the programs [13, 14].

There have been numerous study's concerning BPCR on different aspects like prevalence of BP/CR [15-18], factors associate with BPCR[19], obstetric danger sign [20-22], male involvement [23, 24], knowledge and practice [25, 26], determination of place of delivery [27]. However there is limitation to this study and there is no current study that asses the prevalence and associated factor of BPCR which could have an implication for better intervention.

1.3 Rationale of the study

Every pregnancy is at risk of facing a risk of sudden, unpredictable complications that could end in death or injury to herself or to her infant. Pregnancy related complications cannot be reliably predicted, hence, it is necessary to employ strategies to overcome such problems as they arise.[7]

Women need timely access to skilled care during pregnancy, childbirth, and the post-partum. However, most of the time, their access to care is impeded by delays. Those are delays in deciding to seek care, delays in reaching care, and delays in receiving care.[15] One of the ways to overcome these delays is by using a birth preparedness and complication readiness tools. [15]

Limited study was found in Ethiopia on BP/CR. Therefore, this research was designed to evaluate birth preparedness and complication readiness and factors associated with their practices among antenatal care clients, in selected health center Addis Ababa.

The finding of this study generate relevant information that will be used by policy makers and programmers to develop appropriate and evidence based strategies to increase maternal health service and reduce maternal mortality. And it will address the gap in knowledge and practices of birth preparedness and complication readiness in relation to ultrasound service and other associated factors. It will also help the public health centers of Addis Ababa to develop context based interventions to implement evidences generated from this study.

2. Literate review

2.1. Birth preparedness and complication readiness

Birth preparedness help to decrease the delays that happen when women undergo obstetric complications, such as recognizing the complication and deciding to seek care, reaching a facility where skilled care is available.[6] and it also reduces delays in receiving appropriate care. It calls on providers and facilities to be prepared to attend births and ready to treat complications.[4] BP/CR encourages women, households, and communities making swift decision-making, reduce delays in reaching care once a problem arises and reduces delays in receiving appropriate care. [7] It also calls for providers and facilities to be prepared to attend births and get ready to treat complications

The Maternal and Neonatal Health Program relied on these commonly cited factors can be prohibited with improve preparation and quick action. BP/CR is a comprehensive matrix that comprises the woman and her family, as well as the community, healthcare providers, facilities that serve them, and the policies that affect care for the woman and the newborn [6]

The main core of Birth Preparedness and Complication Readiness is to decreasing the delays in seeking, reaching or receiving care. In order to assist rapid decision making and reduce delays in reaching care once a problem arises.[5]

2.2. Degree and associated factor of Birth preparedness and complication readiness

BP/CR requires identifying a skilled provider and a birth location, recognition of danger signs that may indicate life-threatening complications for the mother and baby, saving money, arranging for transportation, preparing emergency fund and identifying a blood donor which showed pregnant women, their families and communities need to seek assistance in case of emergencies. In addition, BP/CR requires health providers and facilities to be prepared to attend births and treat complications. [11] BP/CR improves preventive behaviors, improves knowledge of mothers about danger signs, and leads to improvement in care-seeking during obstetric emergency [27].

Among the sociodemographic factors, participant's education and occupation, socioeconomic status, number of family members, and the education of husband of the participant were found to be significantly associated with the practice of preparedness of BP/CR according study done in rural block of Haryana. better BPACR practices were observed among those belonging to upper socioeconomic status, dominant caste, having more than five family members, and where the husband has a higher educational status. [27]

Obstetric ultrasound has become a necessary part of ANC around the world, Ultrasound during pregnancy is mainly used to monitor the growth, development, and well-being of the fetus [28, 29] Most pregnant women have a strong demand for ultrasound examinations to attain early diagnostics findings which permits them to acquire appropriate action to be given during pregnancy and childbirth. [30]

2.3. Prevalence of Birth Preparedness and Complication Readiness

Every pregnancy faces "risks" women should be made aware of danger signs of obstetric complications and be ready for complication. The knowledge will eventually permit them and their families to make appropriate decisions to seek care from skilled birth attendants [20].which ultimately directed to partially prevention of Maternal deaths. [23] Counseling on pregnancy danger signs is to be conducted according to focused antenatal care (FANC) guidelines, which include, fetus movement reduced or absence [31].

Studies conducted in Tanzania report low awareness of these danger signs among women with delivery experience only 47% of women attending antenatal visits recall having been informed of such complication [31].

Similar study In Ethiopia , East Harerge, Haremaya wereda study, knowledge on obstetric key danger signs: (three and above danger sign) were mentioned only 11.2%, [21]

Previous studies show that BPCR is less common in many developing countries, and it was practiced differently in different countries: like in North Ethiopia, 22.0 %, [25] Northern Nigeria 27.5 %,[24] Southern Ethiopia 17% [22], Kenya 15% ,[26] and Uganda 27.5% [20]

In India result shows that 76.9% of the families saved some money and kept it aside for incurring cost of delivery and obstetric emergencies; 63.8% of the mothers identified a health facility for obstetric emergency &29.5% Preparedness for transport for emergency.[16].

Study done in India to assess birth preparedness and complication readiness indicated that 47.8% were identified a trained birth attendant, a health facility, arranged for transport, and saved money for emergency considered as well-prepared. In the study, factors associated with well-preparedness were maternal literacy and availing of antenatal services. Deliveries in the slum-home (India) were high (56.4%). Among these, skilled attendance was low (7.4%), 77.3%of them were assisted by traditional birth attendants. Skilled attendance during delivery was three times higher in well-prepared mothers compared to less-prepared mother.[16].

BPCR reduces delays in deciding to seek care. Birth preparedness encourages people to plan to have a skilled health care provider and complication readiness raises awareness of danger signs among women, families, and communities, thereby improving problem recognition and reducing the delay in deciding to seek care. In general, at the demand level, BP/CR promotes the use of a skilled provider at birth through increasing demand and improving access.[32]And it has been concluded that skilled attendant to assist childbirth is the single most critical intervention to reduce maternal mortality[33]

However, according to the demographic and health surveys, only 51% of women in developing countries were assisted by a skilled provider. [34]

Based on previous study's there are five main factors affecting birth preparedness & complication readiness that are Socio-economical factor, governmental factors, Service utilization, Obstetric factors, Cultural factor however these study was focus on socio-economic factors, service utilization and obstetric facts(parity).

Conceptual framework

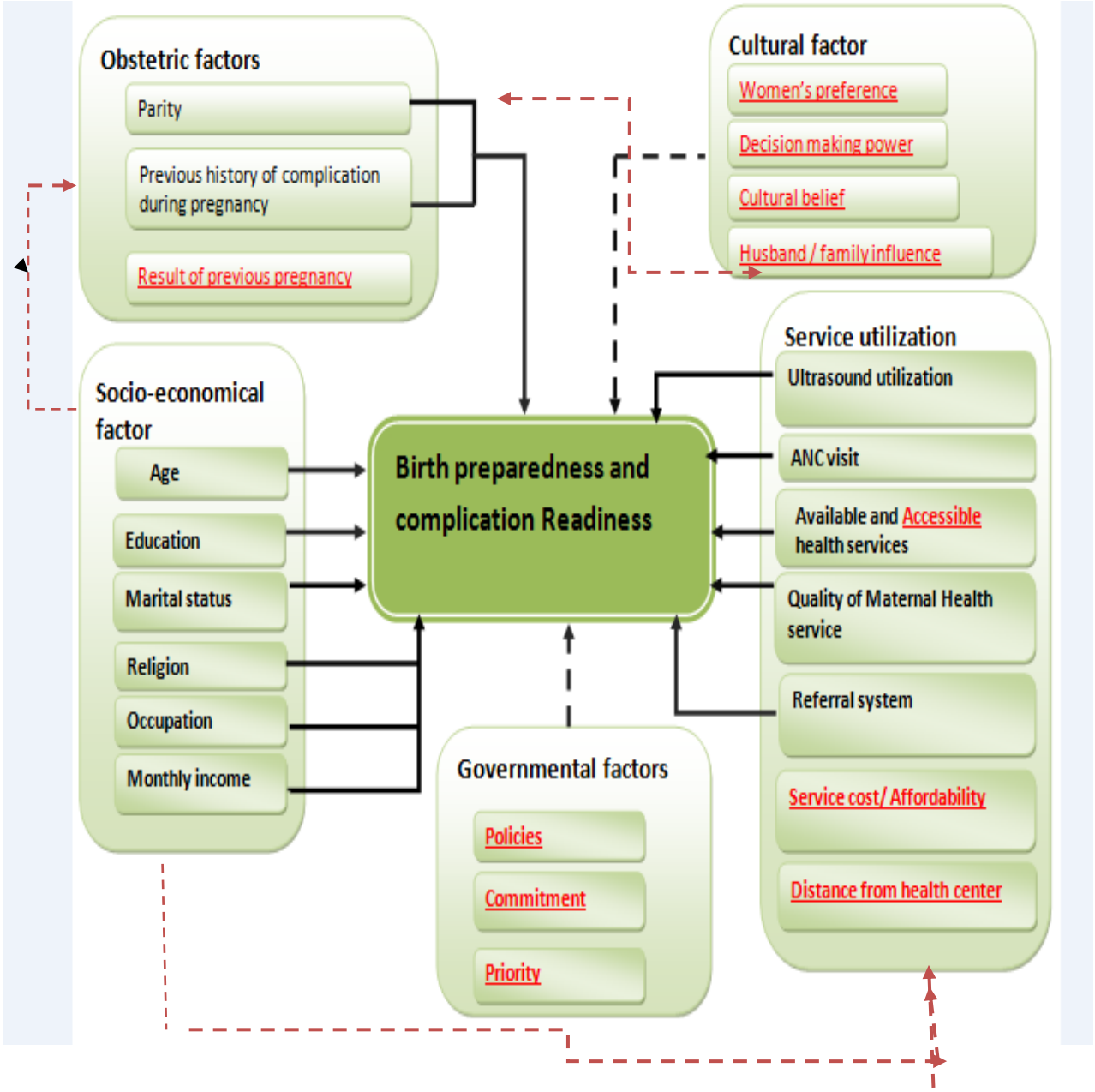

Figure 1- Conceptual frame work for factors related with birth preparedness and complication readiness of pregnant women's in public health centers of Addis Ababa, Ethiopia, 2019

3. Objective

3.1. General objective

- To assess the prevalence and associated factors of birth preparedness and complication readiness among pregnant women during antenatal visit in public health centers in Addis Ababa

3.2. Specific objective

- To assess the prevalence of birth preparedness and complication readiness among pregnant women attending ANC in selected health centers in Addis Ababa
- To determine factors association with birth preparedness and complication readiness among pregnant women attending ANC in selected health centers in Addis Ababa

4. Methods

4.1. Study area and period

The study was conducted in Addis Ababa city administration, the capital and largest city of Ethiopia. its situated in central Ethiopia at an elevation of about 2440 m (about 8000 f.t) above sea level on a plateau[35] Addis Ababa encompasses 10-sub cities and 116 woreda [12]. Each sub-city is expected to serve for a total population of 300,000 and each Woreda for 30,000 people.[12] According to Addis Ababa city administration integrated land information center report Addis Ababa covers an area of 530.14 square kilometers with projected 2017 total population of 3,435,030 [35] with annual growth rate of 2.1%. Among the total population 2.4%women were expected to be pregnant annually. The overall health care activity of the city is coordinated by Addis Ababa regional health bureau. There are 52 hospitals: 12 government, 40 private and 102 health centers. From these 7 of the government hospitals and all of the health centers are under Addis Ababa Regional Health Bureau. One health center is estimated to give service to 40,000 populations. Annual number of expected pregnant women is 35,449. The city has classified into two Administrative layers such as the Sub-City top layer followed by Woreda based on current classification[12]. The study was conducted for a period of one year September2018 to August 2019

4.2. Study design

A cross-sectional study design was used to conduct the study using quantitative method.

4.3. Source population

The source population for this study was all pregnant women having ANC visit in Addis Ababa city Administration during the study period.

4.4. Study population

All pregnant mothers who came to the selected health center for ANC visit during study period and those who meet the eligibility criteria to have

4.5. Inclusion criteria

- Pregnant mothers who are attending 3rd ANC visit and above.
- Women who are mentally capable of being interviewed.

4.6. Exclusion criteria

- Mothers with known chronic disease
- Mothers with complications

4.7. Sample size determination

Sample size was calculated by using single proportion formula by assuming that 50% of the pregnant mothers who have ANC follow up for assessment and evaluation of their pregnancy was birth prepared and ready for complication (to acquire maximum sample size) with 95% confidence interval (CI) and margin of error (D) 0.05.

Where Z=95% confidence interval (1.96)

P= estimates prevalence rate

D=margin of sampling error (0.05)

N=minimum sample size

$$N = \frac{Z\alpha/2^2 \, P(1-P)}{D^2}$$

The maximum sample size was used = 384 then by adding 1.5 design effect and 10% non-respondent rate

Total sample size was = 640

4.8. Sampling technique or procedure

For this study multi-stage sampling technique was used. Out of the ten sub-cities which are found in Addis Ababa city five were chosen by simple random sampling/ lottery methods which gave equal chance for each sub-city, then we use the late six month ANC flow chart to select two health centers from each sub-cities that make a total of ten health centers. Then the total sample size was proportionally allocated for the selected ten Health Centers, depending on the client flow in each Health facilities.

The study participants were selected using systematic random sampling method. Woman who came for their ANC follow-up for the last one month was used as a data frame to calculate the K value.

KOLFE KERANEO sub-city

- Woreda 03 H.C=131 (20.7%)
- Alam bank H.C =110 (17.5)

NIFASILK- LAFTO sub-city

- Woreda-11 H.C =78(12.3%)
- Woreda-02 H.C =68(10.6%)

BOLE sub-city

- Gerge H.C =52(8.1%)
- Mari H.C=39 (6%)

YEKA sub-city

- Kotaba H.C =45(7%)
- Woreda-13 H.C =35(5.4%)

AKAKI-KALITY sub-city

- Akaki H.C =44(6.4%)
- Kality H.C =38 (6%)

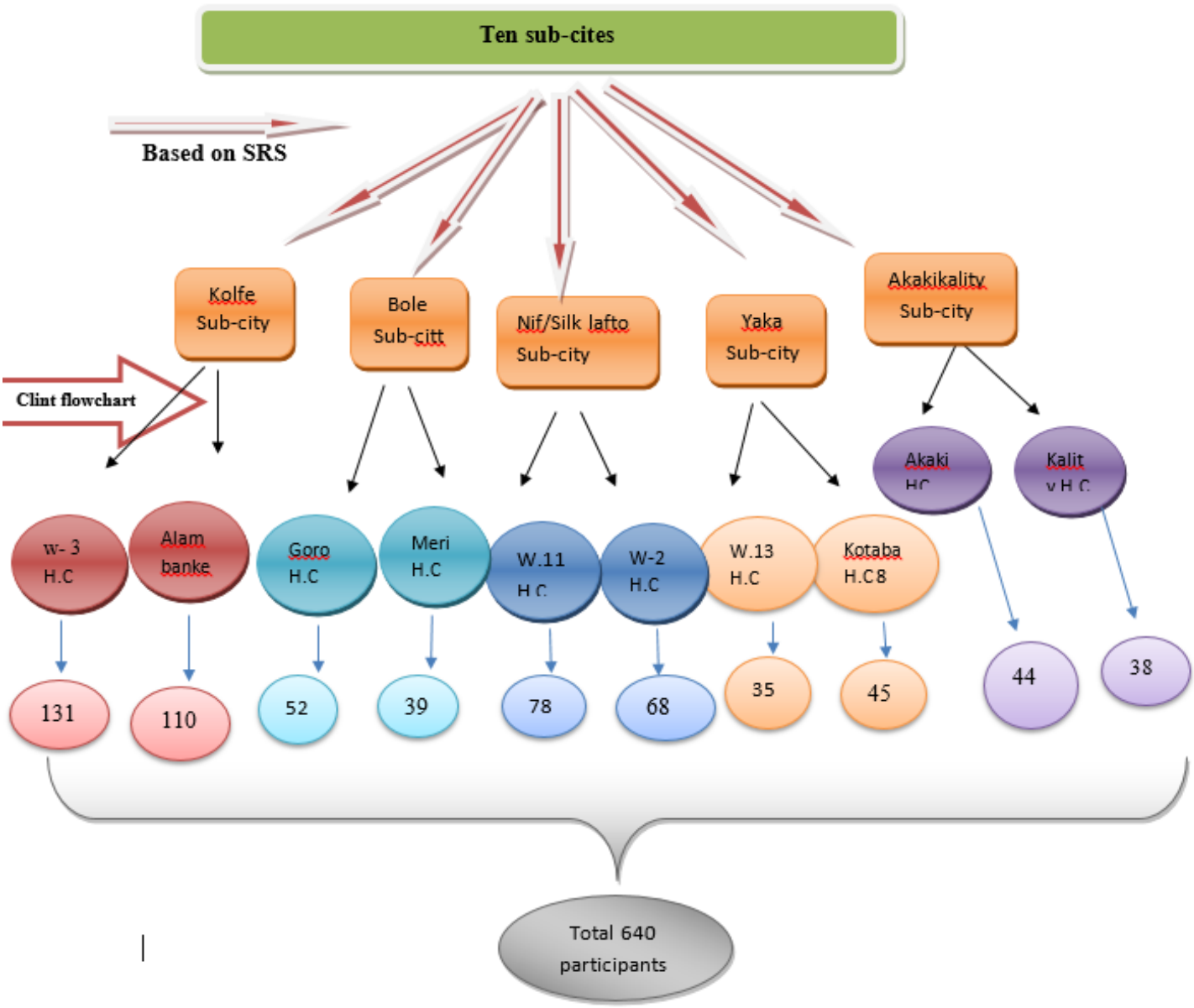

Figure.2 Schematic presentation of the sampling technique procedure

4.9. Data collection procedures

A structured quantitative questionnaire develop by reviewing EDHS questioners and different literatures and adapted to local situation with necessarily modifications.

Data was collected by face to face interview from pregnant woman who came for ANC follow-up during the study period between March to April 2019 and pregnant women who fulfilled the inclusion criteria in the selected health center using structured questioners

The questionnaires were prepared originally in English and then translated in Amharic (local language) version then translated back to English version to check for its consistency. The questionnaires were pre-tested on 5% of the sample size other than the selected health centers in order to know the clarity of the questioner and realize the questioner contains all the relevant variables, to meet the objectives and modifying it. The data was collected by professional BSC nurses and midwifes and supervised by two master's public health officers

4.10. Data quality management

The quality of the data was assured in different ways starting with the questioner by ensuring that it is standard, meets its objective and can be easily understandable to the data collectors and respondents by doing pretesting before data collecting. Experienced ten midwives and nurse data collectors and two health officers as supervisors which doesn't work in the selected health center were recruited. Training was given for two days by principal investigator on how to choose participants, data collection method /process, clarifying how to interview mothers and also about the objective of the study. Then guiding manual was developed that could guide and clarify if any misunderstanding of the questioner for the data collectors. The data collectors make sure that every participant was voluntary to involve in the study before proceeding to the interview. The principal investigator closely followed data collection along with the supervisor on site throughout the data collection period. The questionnaire was checked daily for completeness, inconsistency and error was corrected at the spot.

4.11. Study variables; -

Dependent variable: -

- Birth Preparedness and Complication Readiness

Independent variable: -

- Socio-economical factor
- Obstetrics characteristics
- ANC service utilization
- utilization of ultrasound

4.12. Data analysis procedure

Data editing was carried out every day through the course of the data collection and checked for completeness and consistency. The collected data was intered in to a computer using Epidemiological data (EPI data) software version 3.1 by the principal investigator. Then the data was exported to SPSS software program for cleaning, recoding and analysis. Descriptive results like percentage and frequency distribution of all variables was presented using tables and charts

Logistic regression model was used to determine the association between dependent variable and independent variables. First the association between each independent variable with the outcome variable was determine thorough use of binary logistic regression. Then odds ratio along with the 95% confidence interval was used to ascertain association. Furthermore, multiple logistic regressions were applied to control the effect of confounders with 95% confidence interval and adjusted odds ratios are used to measure the strength of association. $P<0.05$ is Statistical significance.

4.13. Operational definition of terms used in the study

First ANC visit: - visit for the first time after pregnancy is known, to know the condition of the mother and the fetus or before 12 weeks of gestational period

Second ANC visit: -visit made for the seconded time according to the time given appointment to check the fetal and maternal condition at the time between 24-26 weeks of gestational period

Third ANC visit: - visit made for the third time according to the appointment time given to check the fetal and maternal condition or in attending for the first time but more than 28 weeks of gestation

Fourth ANC visit: -visit made for the fourth time or above according to the appointment given to see different conditions of the baby and the mother or in attending for the first time but more than 32 weeks of gestation and above

Know danger sign during pregnancy: - mothers who know any danger sign that could occur during pregnancy

Well prepared mothers: -mothers who were prepared for at least four out of the seven components of birth preparedness plan used in this study. Based on EDHS

Not well prepared mothers: -mothers who were not prepared for any one of birth preparedness plan components or prepared for less than or equal to three components.

Ultrasound used: -Any exposure to ultrasound scan after the discovery of the pregnancy to know the condition of the mother or the fetus

4.14. Ethical consideration

The final proposal was submitted to School of Public Health Research and Ethics Committee (REC) of Addis Ababa University (AAU) for ethical clearance. Then the study was approved by AAU, School of Public Health Ethical Review Committee (ERC). A letter obtained from AAU, School of Public Health REC was submitted to the selected health center and Addis Ababa health office letter of support to gate permission for the study area was obtained from the Health Office of the study area before starting the study. The information sheet and consent was provided for respondents to read for those who can read and the data collector read the consent form for those respondents who cannot read. Informed verbal consent was obtained from study participants. The purpose and the benefit of the study were discussed with each participant.

4.15. Dissemination plan

Findings of the study will be submitted and presented to School of Public Health, Addis Ababa University. Also, the result will be disseminated to the Addis Ababa health office and to the FMoH of Ethiopia. Finally, an attempt will be made to publish the findings to reputable journals

5. Result

A total of 633 pregnant women who came for third or fourth ANC follow-up in the selected health center were participated in the study making the respondent rate of 98.9%.

5.1. Socio -demographic characteristics of the participants

One hundred eighty-two (28,8%) and 285 (45%) of the respondents were between the age range of 20-24 and 25-29yrs respectively. The mean ages of respondents were 26.7 ± 4.7 SD More than half of the participants 361(57%) are followers of orthodox Christian religion. Majority of the participants 337(53.2%) were housewife and 212(33.5%) had primary education and 90(14,2%) were illiterate. Concerning marital status 587(92.7%) of the women were married. Of these who were married most of their husbands 152(24.6%) have completed their secondary school. And also more than half of them 338 (54.8%) are private employee. Majority of them 545(86.1%) had family size less than four per a house holed (table 1). The details are presented in Table1

Table 1. Socio-demographic characteristics of pregnant women in selected health centers of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	Frequency	Percent
Age		
15-19	19	3.0
20-24	182	28.8
25-29	285	45
30-34	105	16,4
35 and above	43	6.8
Ethnicity		
Amhara	211	33.3
Oromo	154	24.3
SNNP	213	33.6
Tigre	42	6.6
Others*	13	2.1
Religion		
Orthodox	361	57.0
Muslim	185	29.2
Protestant	79	12.5
Others**	8	1.2
Occupation		
Housewife	337	53.2
Private employee	159	25.1

Government employee	77	12.2
Daily laborer	29	4.6
Agriculture	9	1.4
Others***	22	3.5
Educational status		
No education	90	14.2
Read and write	42	6.6
Primary	212	33.5
Secondary	147	23.2
Preparatory	36	5.7
Tertiary	106	16.7
Marital status		
Married	587	92.7
Cohabitation	30	4.7
Others****	16	2.5
Husband (partners) education(n=615)		
No education	38	6.2
Read and wright	72	11.7
Primary	136	22
Secondary	152	24.6
Preparatory	74	11.9
Tertiary	145	23.5
Husband occupation(n=617)		
Private employee	338	54.8
Government employee	132	21.4
Agriculture	11	1.8
Daily laborer	103	16.7
Others***	33	5.3
Family size		
1-2	275	43.4
3-4	270	42.7
>4	88	13.9

Others* Afar, Gmbel, Gamo Other ** Catholic Others *** single, divorced other **** merchants

5.2 Past obstetric history

Out of 633 respondents, 235(37.1%) were pregnant for the first time. One hundred seventy-four (49.4) of mothers had their first baby between the age of 20-24 yrs with mean age of 22, ±3.4 S.D. One hundred eleven (27.9%) of the participants had a history of abortion of which 98 (88.3%) of them had at list one abortion. At the same time 48 (12.1%) of the participants had history of still birth of those 41(85.4%) had at list one still birth. Among multipara mothers 323(84.6%) of them had ANC visit during their previous pregnancy. During the current pregnancy more than half 392(61.9%) of the mothers have 3-4 ANC visit. Most participant 392 (62%) decide jointly with their husbands on health related issues. See table 2 for details.

Table 2:- Obstetrics characteristics of study participants in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	**Frequency**	**Percentile (%)**
Number of pregnancy		
1	235	37.1
2-3	310	49.0
≥4	88	13.9
Age at first birth (N=352)		
<15 yrs	9	2.6
15-19 yrs	77	21.9
20-24 yrs	174	49.4
25-29 yrs	88	25.0
30-34 yrs	4	1.1
No of children (N=342)	277	81.0
1-2	65	19.0
3-7		
History of abortion (N=398)		27.9
Yes	111	72.1
No	287	
No of abortion (N=111)		
1	98	88.3
2	8	7.2
3	5	4.5
History of still birth (N=398)		12.1
Yes	48	87.9
No	350	
No of still birth(N=48)		
1	41	85.4
2	7	14.6
Previous ANC visit (382)		
Yes	323	84.6
No	59	15.4
No of current ANC visit		
1-2	202	31.9
3-4	302	61.9
>4	39	6.2
Pregnancy planned(N=384)		
Yes	307	79.9
No	77	20.1
Decision maker regarding to health (N=632)		
Self	52	8.2
Husband	188	29.7
Together/ jointly	392	62.0

5.3. Awareness about obstetric danger signs and Birth Preparedness and Complication Readiness

Most of the study participants 435(68.7%) have knowledge of danger sign during pregnancy. The most common reported obstetric danger signs were vaginal bleeding by three fourth (318) of the participants followed by severe headache 188(42.8%) and swollen hands & face 152(34.9%). In the contrarily tiredness/breathlessness 45(10.3%) was the least one mentioned by the respondents. The majority 350(80.5%) of participants think those in danger signs put the life of the mother or the baby in danger. See figure 1, for more information

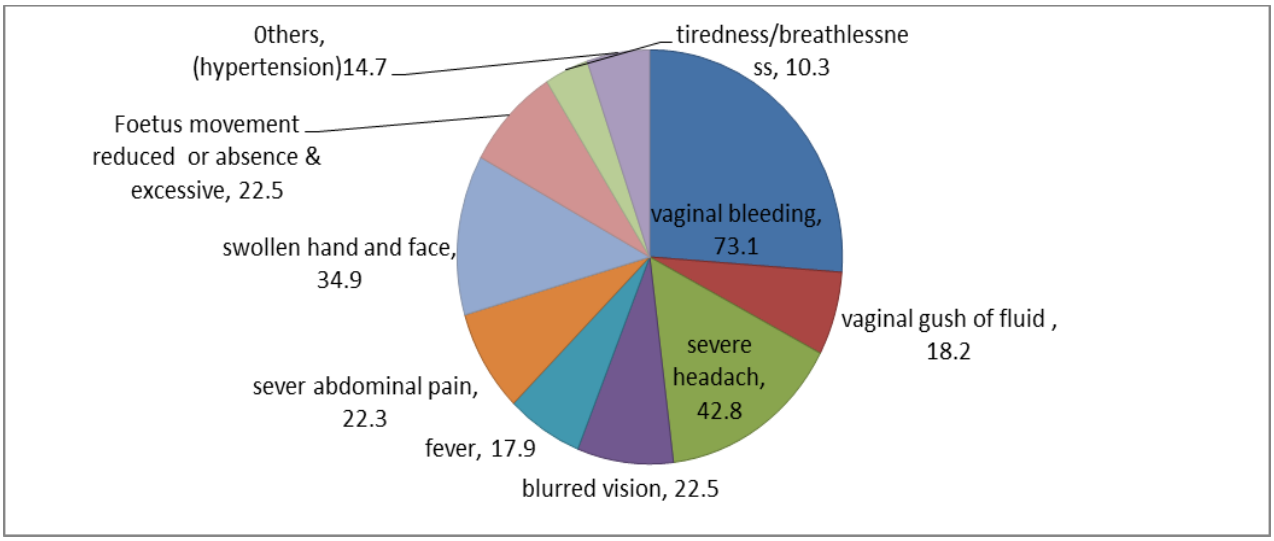

Figure:3 Knowledge of mothers on danger sign during pregnancy in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Almost one third 400(63.3%) of the respondents heard the term birth preparedness and complication readiness. Health professionals 259 (64.8%) and family 166(41.5%) are the main source of information on birth preparedness and complication readiness. According to the participants the most commonly focused topics during ANC visits were: - danger sig 444 (70.8%) followed by Birth and complication readiness 302(48.2%). See Table 3

Table 3- knowledge of respondents on birth preparedness and complication readiness in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	**Frequency**	**Total percentile (%)**
Know any Danger sign during pregnancy		
Yes	435	68.7
No	198	31.3
Do you think those could end the life of the mother or the baby		
Yes	350	80.5
No	85	19.5
Heard the term BP/CR		
Yes	400	63.3
No	233	36.7
Source of information		
Health professional	259	64.8
Community health worker	33	8.3
Health extension worker	11	2.8
Media	15	3.8
Family's	166	41.5
Others*	31	4.8
Counseling during ANC visit Counseling on **(N=627)**		
Danger sign	444	70.8
Early and exclusive breast feeding	88	14
Smoking, alcohol, drugs and harm full practice	124	19.8
Hygiene	295	47
Family planning	139	22.2
Birth & complication readiness	302	48.2
HIV test	156	32

Others* friends

5.4. Practice of Components of Birth preparedness and complication readiness

Among the respondents 500(79%) of them had identified place of delivery. 417(66%) saved money, 130(20.6%) had identified skilled provider. 381 (60.3%) can detect early signs of an emergence. 459 (72.6%) had arranged emergency funds. 220 (34.8%) had identified mode of transportation. Only 72 (11.4%) had arranged blood donor. The overall prevalence of BP/CR was 50.9

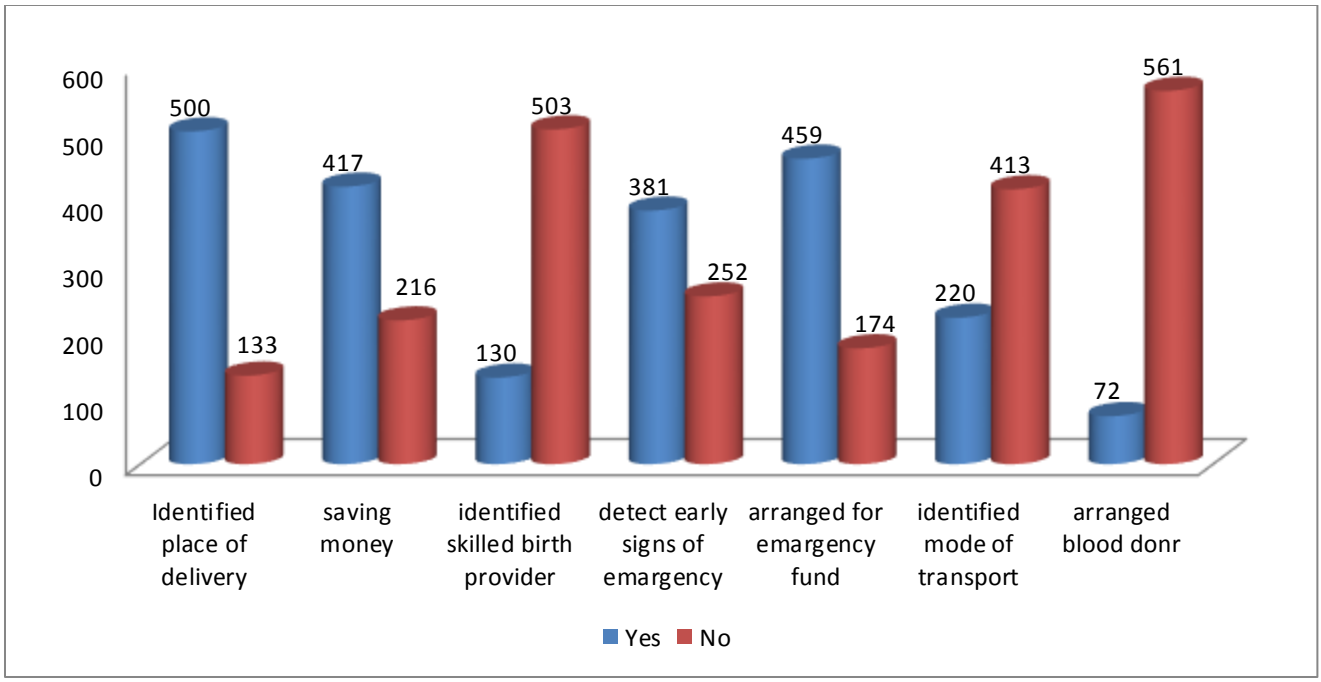

Figure 4- Practices of respondents on preparation for birth and complication readiness in the selected health centers of Addis Ababa, Ethiopia March-April 2019 (n=633)

5.5 prevalence of ultrasound

Out of all study participants 622 (98.3%) of them had ultrasound imaging during the current pregnancy of where 397 (63.8%) of them had at list one ultrasound scan, that made the prevalence rate of ultrasound utilization 98.3% in Addis Ababa. Almost half 318(50.2%) of the respondents had ultrasound scan on their previous pregnancy,

For 588 (94.8%) of the respondents the imaging of ultrasound was requested by health professionals. Other than those pregnant women's who get the ultrasound for free 8(2%) the cost of ultrasound lies between 60 birr to 750 at a maximum, but more than half of the respondents 359 (56.7%) think it was not expansive.

Table 4 - Utilization of ultrasound among respondents in the selected health center of Addis Ababa, Ethiopia from March-April 2019 (n=633)

Characteristics	**Frequency**	**percent**
Previous U/S scan		
Yes	318	50.3
No	67	10.6
NA*	247	39.1
Currant U/S scan		
Yes	622	98.3
No	11	1.7
Frequency of U/S scan (N=622)		
1	397	63.8
2	186	29.9
>2	39	6.3
Initiated to do U/S (N=622)		
Health professional	588	94.8
Self	49	7.9
Others	27	4.4
Expanse states		42.2
Yes	262	57.8
No	359	

NA* primegravid

5.6 Binary logistic regression

5.6.1. Socio-demographic and obstetric characteristics of pregnant women (n=633)

Binary logistic regression was done to assess the association of each independent variable with the outcome variable. Socio-demographic characteristics; maternal age, occupation, and education, and also husband's education and occupation were significantly associated (p-value< 0.05) with birth preparedness and complication readiness at the binary logistic analysis. Marital status and family size was not significantly associated with birth preparedness and complication readiness. (See table: -5)

Table 5- Binary logistic regression of socio demographic characteristic and birth preparedness and complication readiness among pregnant women in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	**Birth prepared and complication readiness**		**COR(95% CI)**
	YES (n, %)	**NO (n, %)**	
Age			
15-19	10(52.6)	9(47.4)	0.726 (0.245, 2.157)
20-24	78(42.8)	104(57.1)	**0.490 (0.249, 0.966)**
25-29	157(55.3)	127(44.7)	0.808 (0. 420, 1.555)
30-34	51(48.6)	54(51.4)	0.618 (0.300, 1.270)
35 and above	26(60.4)	17(39.6)	1
Total			
Occupation			
Housewife	153(45.4)	184(54.6)	1
Private employee	84(52.8)	75(47.2)	1.347 (0.923, 1.966)
Government employee	63(81.8)	14(18.2)	**5.412 (2.918, 10.035)**
Daily laborer and Agriculture	6(15.8)	32(84.2)	**0. 225 (0.092, 0.553)**
Others*	16(72.7)	6(27.3)	**3.207 (1.225, 8.396)**
Educational status			
No education	27(30)	63(70)	1
Read and wright	17(40.5)	25(59.5)	1.587 (0.739, 3.405)
Primary	85(40.1)	127(59.9)	1.562 (0.921, 2.648)
Secondary	84(57.1)	63(42.9)	**3.111 (1.783, 5.429)**
Preparatory	25(69.4)	11(30.6)	**5.727 (2.489, 13.181)**
Tertiary	84(79.2)	22(20.8)	**8.697 (4.533, 16.688)**
Marital status			
married	303(51.6)	284(48.4)	1.372 (0.504, 3.732)
Cohabitation	12(40)	18(60)	0.857 (0.251, 2.928)
Others**	7(43.75)	9(56.25)	1

Husband (partners) education (n=615)			
No education	13(36.1)	23(63.9)	1
Read and wright	23(31.9)	49(68.1)	0.830 (0.358, 1.926)
Primary	50(36.8)	86(63.2)	1.029 (0.479, 2.209)
Secondary	74(48.6)	78(51.3)	1.679 (0.792, 3.556)
Preparatory	48(64.9)	26(35.1)	**3.266 (1.423, 7.497)**
Tertiary	106(73.1)	39(26.9)	**4.809(2.220, 10.415)**
Husband occupation(n=617)			
Private employee	187 (55.3)	151 (44.6)	1.681 (0.816, 3.463)
Government employee	91 (68.9)	41 (31.1)	**3.012 (1.377, 6.588)**
Agriculture or Daily laborer	23 (20.2)	91 (79.9)	**0.343 (0.150,0.785)**
Others*	14 (42.4)	19 (57.6)	1
Family size			
1-2	136 (49.5)	139 (50.5)	1.024(.633, 1.655)
3-4	143 (53)	127 (47)	1.178 (0.728,1.907)
>4	43 (48.9)	45 (21.1)	1

Others* merchant Others** single, divorced

5.6.2. Past obstetric characteristics of the respondents

Mothers who had a history of stillbirth, previous ANC visit and decision making power had significant association with birth preparedness and complication readiness. But the others have no association with the outcome variable including gravidity, parity and abortion. (see table 6)

Table 6 – Binary logistic regression of obstetric characteristics and birth preparedness and complication readiness among pregnant women in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	**Birth prepared and complication readiness**		**COR(95% CI)**
	YES (n, %)	**NO (n, %)**	
Number of pregnancy			
1	121(51.5)	114(48.5)	1.162 (0.712, 1.898)
2-3	159(51.2)	151(48.7)	1.153 (0.718, 1.852)
≥4	42(47.7)	46(52.3)	1
No of children (N=342)	131(32.1)	277(67.9)	1.149(0. .669, 1.973)
1-2	33(33.6)	65(66.3)	1
3-7			
History of abortion (N=398)	52 (46.8)	59 (53.1)	0.816(0.526,1.266)
Yes	149 (51.9)	138 (48.1)	1
No			
History of still birth (N=398)			
Yes	17 (83.5)	31 (64.5)	**0.495(0.264,0.927)**
No	184 (52.6)	166 (47.4)	1

ANC visit in previous pregnancy (382) Yes No	 174 (53.9) 21 (35.6)	 149 (46.1) 38 (64.4)	 **2.113(1.188,3.759)** 1
No of current ANC visit 1-2 3-4 >4	 92 (45.5) 208 (53.1) 17 (43.6)	 110 (54.4) 184 (46.9) 22 (56,4)	 0.646 (0.324,1.290) 0.874 (0.450,1.696) 1
Pregnancy planned(N=384) Yes No	 157 (51.1) 33 (42.9)	 150 (48.8) 44 (57.1)	 1.396 (0.843,2.310) 1
Decision maker regarding to health Self Husband Together	 28 (53.8) 75 (39.9) 219 (55.9)	 24 (46.2) 113 (60.1) 173 (44.1)	 0.922 (0.516,1.647) **0.524 (0.368,0.747)** 1

5.6.3. Awareness about obstetric danger signs and Birth Preparedness and Complication Readiness

Birth preparedness and complication readiness was found to have a significant association with knowledge on danger sign during pregnancy, heard the term BP/CR, and issues discussed during ANC visits on danger sign, early and exclusive breast feeding, how to be prepared for birth and ready for complication, Smoking, avoidance of alcohol, drugs and harmful practice in binary regression.

Table 7 - Binary logistic regression of obstetric danger sign and birth preparedness and complication readiness among pregnant women in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	**Birth prepared and complication readiness**		**COR(95% CI)**
	Yes	No	
Know any danger sign during pregnancy Yes No	242 (55.6) 80 (40.4)	193 (44.4) 118(59.6)	**1.521 (1.110, 2.085)** 1
Danger signs end the life of the mother or the baby Yes No	 190 (54.3) 52 (61.2)	 160 (45.7) 33 (38.8)	 0.754 (0.464,1.223) 1
Heard the term BP/CR Yes No	 230 (57.5) 92 (39.7)	 170 (42.5) 140 (60.3)	 **2.059 (1.481, 2.862)** 1

Source of information about BP/CR			
Health professional	152 (58.7)	107 (41.3)	1.147 (0.758, 1.736)
Community health worker	14 (42.4)	19 (57.6)	0.515 (0.250, 1.059)
Health extension worker	6(54.5)	5 (45.5)	0.884 (0.265, 2.946)
media	10 (66.7)	5 (33.3)	1.500 (0.503, 4.472)
family's	101 (60.8)	65 (39.2)	1.265 (0.844, 1.895)
others	18 (58.1)	13 (41.9)	1.025 (0.488, 2.155)
Counseling during ANC visits			
Danger sign	239 (53.8)	205 (46.2)	**1.501(1.061, 2.123)**
Early and exclusive breast feeding	59 (67)	29 (32)	**2.183 (1.357,3.512)**
Smoking, avoidance of alcohol, drugs and harm full practice	75 (60.5)	49 (39.5)	**1.625 (1.089,2.424)**
Hygiene	141 (47.8)	154 (52.2)	0.792 (0.579,1.085)
Family planning	79 (56.8)	60 (43.2)	1.361 (0.931,1.989)
Birth & complication readiness	170 (56.3)	132 (43.7)	**1.849 (1.315, 2.601)**
HIV test	91 (58.3)	65 (41.6)	0.836 (0.569,1.229)

5.6.4. Ultrasound prevalence

In binary regression previous exposure to ultrasound scan, frequency of exposure to the ultrasound scan and the person who recommend the ultrasound scan had significant association with birth preparedness and complication readiness whereas, utilization of ultrasound in the present pregnancy had no significant association with birth preparedness and complication readiness (COR=2.807, 95% CI; 0.738,10.681)

Table 8 - Binary logistic regression of ultrasound utilization and birth preparedness and complication readiness among pregnant women in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	**Birth prepared and complication readiness**		**COR(95% CI)**
	YES (n, %)	**NO (n, %)**	
Previous U/S scan			
Yes	175 (55.0)	143 (45.0)	**2.681(1.529, 4.700) ***
No	21 (31.3)	46 (68.7)	1
Current U/S scan			
Yes	319 (51.3)	303 (48.7)	2.807(0.738,10.681)
No	3 (27.3)	8 (72.7)	1
Frequency of U/S scan (N=622)			
1	228(57.4)	169(42.6)	**2.453 (1.711, 3.517) ***
2	120)64.5)	66(35.5)	**4.497 (2.080, 9.722) ***
>2	30(76.9)	9(23.1)	1
Suggested to do ultrasound			
Health professional	296(50.3)	292(49.7)	**0.461(0.214, 0.990)**
Self	32 (65.3)	17(34.7)	**1.876 (1.019, 3.455)**

Expansiveness of US scan Yes No	 127 (48.5) 191 (53.2)	 135 (51.5) 168 (46.8)	 0.827(0.602,1.138) 1

5.7. Multivariate analysis

Variables that showed significant association in binary logistic regression model were maternal age, maternal occupation, maternal education, husband's education and occupation and among the obstetric character's history of still birth, previous ANC visit and decision making. Regarding questions about knowledge of danger sign and BP/CR knowledge on danger sign during pregnancy, heard the term BP/CR and counsel on danger sign, breast feeding, substance abuse, BP/CR during ANC visit had significant association with birth preparedness and complication readiness. Concerning utilization of ultrasound: - having previous exposure to U/S scan and ultrasound scan being suggested by health professional were significantly associated with birth preparedness and complication readiness.

Those variables significantly association with BP/CR during binary logistic regression were included in multi variable logistic regression model (p= 0.05). After the multivariable logistic regression model was done maternal occupation, maternal education, decision making power, and counseling on danger sign and BP/CR during ANC visit had found significantly associated with BP/CR.

Mothers who were governmental employee were 2.29 times more likely to be prepared for birth and complication readiness when compared to housewife mothers (AOR= 2.286; 1.028, 5.086). Mothers who had secondary education (AOR= 2.459:1.002, 5.038), preparatory (AOR= 3.254; 1.245, 8.506) and Tertiary education (AOR=3.001; 1. 173, 7.679) had 2.459, 3.254 and 3.001 times more likely to be prepared for birth and ready in case of complication than those mothers who have no education respectively. Mothers whose decision making power was under the control of their husbands (AOR=0.555: 0.324, 0.949) were 55% less likely to be prepared for birth and ready in case of complication than those mothers who decide together with their husbands/partner's. Birth preparedness and complication readiness was also 1.778 and 1.395 times more likely among mothers who were counseled about danger sign (AOR=1.778; 1.196, 2.641) and birth preparedness complication readiness (AOR=; 1.395; 1.901, 2.160) respectively during their ANC visit than not counseled.

Table 9- Multivariate analysis of predictor of birth preparedness and complication readiness in the selected health center of Addis Ababa, Ethiopia March-April 2019 (n=633)

Characteristics	**Birth prepared and complication readiness**		**]AOR(95% CI)**
	Yes	No	
Maternal age			
15-19	10(52.6)	9(47.4)	2.288 (0.163, 3.035)
20-24	78(42.8)	104(57.1)	0771. (0. 252, 2.356)
25-29	157(55.3)	127(44.7)	0. 703 (0. 266, 1.862)
30-34	51(48.6)	54(51.4)	0.766 (0. 287, 2.045)
35 and above	26(60.4)	17(39.6)	
Maternal occupation			
Housewife	153(45.4)	184(54.6)	
Private employee	84(52.8)	75(47.2)	0. 986 (0.642, 1.514)
Government employee	63(81.8)	14(18.2)	**2.286 (1.028, 5.086) ***
Daily laborer and Agriculture	6(15.8)	32(84.2)	0.505 (0.189, 1.351)
Others	16(72.7)	6(27.3)	2.810 (0.821, 9.618)
Maternal Educational status			
No education	27(30)	63(70)	
Read and wright	17(40.5)	25(59.5)	1.407 (0.609, 3.252)
Primary	85(40.1)	127(59.9)	1.535 (0.799, 2.947)
Secondary	84(57.1)	63(42.9)	**2.459 (1.002, 5.038) ***
Preparatory	25(69.4)	11(30.6)	**3.254 (1.245, 8.506) ***
Tertiary	84(79.2)	22(20.8)	**3.001 (1.173, 7.679)***
Husbands Educational status			
No education	13(36.1)	23(63.9)	
Read and wright	23(31.9)	49(68.1)	0.510 (0.193, 1.346)
Primary	50(36.8)	86(63.2)	0.685 (0.275, 1.709)
Secondary	74(48.6)	78(51.3)	0.717 (0.286, 1.798)
Preparatory	48(64.9)	26(35.1)	1.178 (0.411, 3.378)
Tertiary	106(73.1)	39(26.9)	1.077 (0.397, 2.922)
Husbands occupation			
Private employee	187 (55.3)	151 (44.6)	1.770 (0.803, 3.900)
Government employee	91 (68.9)	41 (31.1)	1.514 (0.624, 3.669)
Agriculture and Daily laborer	23 (20.2)	91 (79.9)	0.611(0.239, 1.560)
Others	14 (42.4)	19 (57.6)	
History of still birth (N=398)			
Yes	17 (83.5)	31 (64.5)	0.760 (0.264, 2.187)
No	184 (52.6)	166 (47.4)	
Previous ANC visit (382)			
Yes	174 (53.9)	149 (46.1)	1.745 (0.894, 3.408)
No	21 (35.6)	38 (64.4)	

Decision maker regarding to health (N=632) Self Husband Together	 28 (53.8) 75 (39.9) 219 (55.9)	 24 (46.2) 113 (60.1) 173 (44.1)	 0.730 (0. 275, 1.943) **0.555 (0.324, 0.949)***
Know any Danger sign during pregnancy Yes No	 242 (55.6) 80 (40.4)	 193 (44.4) 118(59.6)	 0.611 (0.239, 1.560)
Heard the term BP/CR Yes No	 230 (57.5) 92 (39.7)	 170 (42.5) 140 (60.3)	 1.089 (0.578, 2.051)
Counseling during ANC visits Danger sign Early and exclusive breast feeding Smoking, avoidance of alcohol, drugs and harm full practice Birth & complication readiness Not counseled for each separately	 239 (53.8) 59 (67) 75 (60.5) 170 (56.3)	 205 (46.2) 29 (32) 49 (39.5) 132 (43.7)	 **1.778 (1.196, 2.641) *** 0.811 (0.501, 1.311) 1.395 (0.901, 2.160) **1.395 (1.901, 2.160)***
Previous U/S scan Yes No	 175 (55.0) 21 (31.3)	 143 (45.0) 46 (68.7)	 2.212 (1.161, 4.214)
Current U/S scan Yes No	 319 (51.3) 3 (27.3)	 303 (48.7) 8 (72.7)	 2.807(0.738,10.681)
Frequency of U/S scan (N=622) 1 2 >2	 228(57.4) 120)64.5) 30(76.9)	 169(42.6) 66(35.5) 9(23.1)	 1.742 (0.969, 3.131) 1.980 (0.547, 7.167)
Ordered to do U/S (N=622)620 Health professional Self	 296(50.3) 32 (65.3)	 292(49.7) 17(34.7)	 2.042 (0.179, 23.350) 2.188 (0.496, 9.662)

6. Discussion

This study was conducted to assess ultrasound utilization and association with birth preparedness and complication readiness during pregnancy among pregnant mothers in antenatal care unit in public health centers in Addis Ababa. This study found that 622 (98.3%) of pregnant women who came for ANC follow up had at least one ultrasound scan.

Nearly the entire woman in the study (98.3%) had ultrasound scan during their current pregnancy. These finding could differ in different settings and accesses to the ultrasound but ther is no study that assess the prevalence of ultrasound utilization. In this study there is higher magnitude of utilization of ultrasound that could be result from the recommendations of health professionals to have at least one ultrasound scan for every pregnant mothers during their pregnancy pared in the study setting.

Birth preparedness and complication readiness was found to have significant association with maternal occupation, maternal education, decision making power and counseling on birth preparedness and complication readiness and key danger sign as one topic during visit for ANC service.

In this study half (50.9%) of the respondents had made arrangement during pregnancy for birth and its complication by identifying place of delivery, means of transportation, skilled provider, saving money, emergency funding, early sign of emergency, and blood donor. This finding was inconsistent with results reported from community based study made in southern Ethiopia that reveal only 17% of pregnant women were well prepared [17] and on other meta-analysis study that found 32% were well prepared. [36] These could be due to difference in study design and study area (setting) and the accessibility.

This study found that maternal occupation (any employment) is significantly association with birth preparedness and complication readiness. Even-though there is no other study which support this association, these could be due to the fact that almost half of participants in the study were employee in different work area but in other study's most were unemployed so this could be due to sample size.

Educated mothers were found to be significantly associated with well preparedness and complication readiness. Those mothers with secondary educational levels (AOR= 2.459, 95% CI; 1.002, 5.038) and above were more likely to be well prepared and ready in case of complication than those who have no education. The finding of this study was analogous with a previous cross-sectional study conducted in central Tanzania (AOR= 2.26, 95% CI ; 1.39, 3.67) [18] and another study in adigrat town, northern Ethiopia (OR= 2.11, 95% CI; 1.17, 3.80). [25] And also consistence result was observed in community based case-control study in southern Ethiopia. [27] It's also expected that educated mothers pay more attention to their health in order to insure improved health for themselves and their fetus

This finding indicates that mothers who decide together with their husbands about health related issues are also showed significant association with BP/CR than those whose diction making power are repressed by their husbands (AOR= 0.555, 95% CI; 0.324, 0.949).

Advice given on preparation of birth and how to be ready if complication occurs for mothers during ANC follow up were significantly associated with BP/CR (AOR=1.395, 95% CI; 1.901, 2.160). The finding of this study was different from community based cross-sectional study done in Adigrat town [25] and southern Ethiopia. [19] This could be due to the effort of advice in raising the awareness of woman on birth preparedness and complication readiness which in turn end up in a better practice. And also the availability and accessibility of experienced health provider could also be considered.

There is a significant association with counseling on key danger sign during ANC follow-up and BPCR (AOR=1.778, 95% CI; 1.196, 2.641). which show that counseling on key danger sign whenever the chance appear will help them to give more attention and be more prepared and separate from the normal physiology when the arise come. There was no study that assesses counseling on key danger sign but there are other studies on the association of knowledge of key danger sign and birth preparedness and complication readiness. These could be due to interpretation of the questions which implies the same meaning with different explanations

When we come to the components of birth preparedness and complication readiness separately, 500(79%) had identified place of delivery. This result was less in southern Ethiopia [27] and large compared with meta-analysis study (6). This could be due to difference in socio-

economical states and in most rural areas home deliver is common phenomena. Whereas in Addis Ababa where there is many options to deliver beside home and relatively good infrastructure there was minimum home delivery as a result many respondents has chosen where they plan to deliver.

The next commonly prepared component was 459(72.6%) arranged for emergency fund and 417(66%) saving money. This result also agrees with the above study in southern Ethiopia.[17] This could be due to that half of the mothers had work so they must have had arranged for emergency. More than half 381(60.3%) had able to detect early sign of emergency, Compare it with other study its larger than meta-analysis study [36] but much similar than southern Ethiopian study. Similar result was observed regarding 220(34.8%) transport arrangement, compare it with other study in different reigns of Ethiopia (meta-analysis) 33.39% had arranged for transport. [40] This lower result could be due to lack of awareness about the need and how to get ambulance service during emergency.

In this study area there was hardly a chance to choose your health provider that could be the reason for the lower 130(20.6%) to identify health provider the same (20.5%) result was observed when Correlating it with other cross sectional study in southern Ethiopia [17] perseverant efforts are required to address the barriers that hinder to identify health provider

Among the important components considered in the study, the least commonly made arrangement was 72(11.4%) arranging blood donor. This is the same with other study [27] with this could be because in this setting there is blood donation processes passes through Red Cross store which were collected from previous voluntary blood donors.

7. Strength and limitation of this Study

7.1. Strength of the study

- Even though the data collectors were health providers there were not working in that specific facility in order to minimize information bias.
- Pre- test was done out of the study sites before actual data collection.
- Data collectors were extensively trained and manual was prepared to guide the data collectors.

7.2. Limitation of the study

- Only those mothers who came for 3rd ANC visit and above were considered in this study.
- The study was conducted in the health facilities due to this it does not include those women who did not came to the health facilities.
- Due to the nature of cross- sectional study design it has limitation to know the cause and effect relationship.

8. Conclusion

Utilization of ultrasound was found to be high in this study nearly all respondents had ultrasound but there was no association with BPCR. Half of the participants were well prepared for birth preparedness and complication readiness Woman's educated till secondary level and above, being employed, have decision making power concerning health and counseled on BPCR and key danger sign during pregnancy were those women's who were prepared for birth and ready for complication. Using ultrasound scan during pregnancy had no significant association with birth preparedness and complication readiness. Those pregnant women's who got counseling on birth preparedness and complication readiness during ANC was found more prepared for birth.

9. Recommendation

- ✓ The government and other responsible bodies like health professionals who give ANC service should make efforts to increase pregnant women's awareness about birth preparedness and complication readiness.
- ✓ To increase the awareness of BP/CR health professionals who give ANC should have to focus on counseling of BP/CR than ultrasound scan and when they prescribe the ultrasound the result should be clearly mentioned for the client in a way related to what they should have to prepare for birth and complications if they appear.
- ✓ The government should give more chance for woman to participate in different governmental work opportunity
- ✓ Further study is recommended regarding on how to increase birth preparedness and complication readiness
- ✓ As individual level woman decision should be respected and must be appreciated in family's and as a community

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Annex

Annex 1: English version

INFORMATION SHEET AND CONSENT FORM

Greeting:-Good morning/afternoon!

My name is---------- I am working as data collector for the study being conducted in this woreda by Mss. Rediate sileshi kefalaw who is studying for her master's degree at Addis Ababa University Collage Of Health Sciences, school of public health science. I kindly request you to lend me your attention to explain you about the study and how you have been selected as study participant.

Study title–Assessment of birth preparedness and complication readiness and utilization of ultrasound among pregnant women during antenatal care in Addis Ababa, Ethiopia.

Purpose— The study will be helpful to assess birth preparedness and complication readiness and utilization of ultrasound among mothers in antenatal care unit in Addis Ababa. Knowing these practice contribute to design appropriate intervention to improve maternal care service given to them. Moreover, the study aims to write a thesis for partial requirement for the fulfillment of Master's in public heath Reproductive and family Health.

Procedure and duration: First of all we selected you to take part in this study randomly. There are ---- questions to answer. By interviewing you, the questioner will be filled. The interview will take around 20-25 minutes.

Risks: The risks of being participating in this study are very minimal which is taking a few minutes of your time the procedure doesn't bear any physical or psychological trauma.only taking few minutes.

Benefit: At this moment you may not get any direct benefit by being involved in this study but the information you provide is very important to solve problems on maternal care issue.

Confidentiality: The information that you provide us will be kept confidential. The name and other identifiers of participants will not be used in the study to ensure anonymity of the study.

Rights: Participation in this study is fully voluntary. You have the right to declare not to participate in this study and you have the right to quit the study any time

Contact address: If there are any questions or unclear idea any time about the study or the procedures, please contact and speak to Principal investigator**.**

Principal investigator: MSS. Rediate sileshi kefalaw , Cell phone number:+2519 12214217

E- Mail:-rediatesileshi2010@gmaill.com

If you are willing to be in the study, you will be agreeing and let us proceed

Declaration of informed voluntary Consent

I have read/was read to me this consent form or participant information. I have clearly understood the purpose of the research, the procedure, risks and benefits, issues of confidentiality, rights of participating and contact address for any queries. I was given the opportunity to ask questions for things that were not unclear. I was informed that I have the right to quit from the study at any time; therefore I declare my voluntary consent to participate in this study with my signature.

Signature _____ date_____

Interviewers name _____ signature _____ date _____

Questionnaire

English version questionnaire

Code No._____

Instruction: circle the response from the alternative and write the answer for open ended question on the space provided.

Section 1: Socio-demographic information

Q.no	Questions	Answer	SKIP
101	How old are you in completed years?	----------years	
102	What is your Ethnicity?	Amahara……..1 Oromo…….2 SNNPR ….……....3 Tigre……....4 Others [Specify…….97	
103	To which religion do you belong	1. Orthodox 4. Catholic 2. Muslim 5. Other 3.Protestant	
104	Occupation	1. Housewife 5. Agriculture 2. Private employee 6. Other (Specify)_ 3. Government employee 4. Daily laborer	
105	What is your Educational level?	1. No Education 2. Only read and Wright 3. Primary 4. Secondary 5. Preparatory 6. Tertiary	
106	What is your current marital status	1.married 4. widowed 2. cohabitation5. single	If not married go to Q 111

		3. Divorced	
117	What was your age at first marriage	----------years	
108	What is your family size?	----------	
109	Husband Educational status:	1. No Education 2. Primary 3. Secondary 4. preparatory 5. Tertiary	
110	Husband occupation:	1. Private employee4. Daily laborer 2. Government employee 3. Agriculture 5. Other (Specify)_____	
111	What is the average family income per months?	----------ETB/Month Birr	

Section Π

Obstetrics characteristics

Q.no	Questions	Answer	SKIP
201	What is the number of births you gave until now(include if there is still birth or died soon)	----------	
202	At what age was your first pregnancy	----------years	
203	How many children do u have before this pregnancy?		
204	What outcomes did you face during child birth?(if multiple gravid) (more than one answer is possible)	1-Abortion 2-Live birth 3-Still birth 4-Others,specify----------	

205	Have you had ANC visit in your late previous pregnancy (just before the current one) ?(if multiple gravid)	1. Yes 2. No	
206	Gestational age(in month) of your current pregnancy?	----------	
207	In this pregnancy, How many times do you have ANC follow up?	----------	

Section III components of BP and CR

301	Do you know any /some serious health problem/s that can occur during pregnancy that could endanger the life of pregnant women?	Yes…….....1 No…….....2	If no skip to Q 305
302	Can you mention them?	1.Vaginal bleeding……....1 2. Vaginal gush of fluid……..2 3. Severe headache…….3 4. Blurred vision……...4 5. Severe abdominal pain……5 6.Swollen hands and face……..6 7.Fever……..7 8.Foetus movement reduced or absence and excessive …….8 8. Convulsion…….9 9.Tiredness/breathlessness……10 10. Others (specify)……97	
303	Do You think that these danger signs threaten the life of the unborn baby	1-Yes 2-No	If no skip to Q 305
304	Which one of these danger signs threaten the life of the unborn baby	1.Vaginal bleeding……....1 2.Severe headache…….2 3 Blurred vision……...3 4. Severe abdominal pain……4 5.Swollen hands and face……..5 6.Fever……..6 7.Foetus movement reduced or absence and excessive …….7 8.tiredness/breathlessness……8 9. Others (specify)……97	
305	Have you ever heard the term ―Birth preparedness‖?	Yes……1 NO…….....2	If no skip to Q 307

306	From whom did you get the information?	Health professional…….1 Community Health Worker …..2 Health Extension Worker ……..3 Media…….……4 Family…….……5 Others (specify)…….97			
307	Could you tell me the provided pregnancy related topics during ANC visit? (Don't show/ read the option's)	Education about: 1. Danger sign 2. Early and exclusive breast feeding 3.Smoking cessation, avoidance of alcohol, drugs and harm full practice 4. Hygiene 5. Family planning 6. Birth & complication readiness 7. Next appointment time 8. Others(specify)……..94	1YES	2NO	Skip
308	Who is the decision maker in the house hold	1-Self 2-Husband 3-Self and husband 4-Others,specify----------			

Part IV. Practices of respondents on preparation for birth

401	Do youknow when you are going to give birth/ EDD	01. Yes ___ 02. No ___	
402	Do you Identify place of delivery	01. Yes ___ 02. No ___	
403	Are you saving money	01. Yes ___ 02. No ___	
404	Have you identified skilled provider	01. Yes ___ 02. No ___	
405	Can you detect early signs of an Emergence?	01. Yes ___ 02. No ___	
406	Have you arranged for emergency funds?	01. Yes ___ 02. No ___	
407	Have you Identified mode of Transportation	01. Yes ___ 02. No ___	
408	Have you arranged blood donor	01. Yes ___ 02. No ___	

Part V. utilization of ultrasound

501	Have you had ultrasound scan during previous pregnancy?(if multi-gravid)	01. Yes ___ 02. No ___	
502	Have you had ultrasound scan in the current pregnancy	01. Yes ___ 02. No ___	If no skip to Q50
503	Who told /informed you to had the ultrasound scan	1.Health professional……1 2.Community Health Worker……..2 3.Health Extension Worker ……..3 4.Media…….……4 5.Family…….……5 6.Others (specify)……97	
504	How much did you paid for ultrasound scan?	_____ ETB birr	
504	Was it expansive	01. Yes ___ 02. No ___	
505	In which month of your pregnancy did you had ultrasound scan?	_____ ETB birr	
506	How do you fill about having ultrasound scan during pregnancy? (words)		

Annex 2: Amharic Version

ስለጥናቱ አጠቃላይ መረጃ እና የስምምነት ማስገንዘቢያ ቅጽ

ጤና ይስጥልኝ እንዴት አደረዋል /እንዴትዋሉ/ልሽ

እኔ---------- እባላለሁ፡፡ እዚህ የመጣሁት ይህንን ጥናት የምታካሂደው የአዲስ አበባ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ የሕብረተሰብ ጤና ትምህርት ቤት የስነ-ተዋልዶ ትምህርት ክፍል የድህረ- ምረቃ ተማሪ የሆነችውን ረድኤት ሰለሺን ወክዬ ነው፡፡ ጥናቱ ወላድ እናቶች አልትራሳውንድ አጠቃቀም እና ቅድመ ወሊድ ዝግጅትና ሊያጋጥሙ የሚችሉ ችግሮች ተዘጋጅቶ መጠበቅ ላይ ያለው ተጽእኖ ላይ ሲሆን የጥናቱ ተሳታፊ ለመሆን ወይም ላለመሆን እንዱወስኑ በቅድሚያ የተወሰነ መረጃ እንሰጥዎታለን፡፡

የጥናቱ አላማ፡-

በቅድመ ወሊድ ክትትል ጊዜ የአልትራሳውንድ ምርመሪ ማድረግ በወሊድ ዝግጅት ሊያጋጥሙ የሚችሉ ችግሮች ተዘጋጅቶ መጠበቅ ላይ ያለውን ልዩነት ለማየት ነው፡፡ ይህንን ማወቃችን አዲስ ፖሊሲ ለመቅረጽና ትክክለኛ ውጤት ያለውን መፍትሄ ለመሰጠት ይረዳናል፡፡

መጠይቁ የሚደረግበት መንገድና የሚወሰደው ጊዜ፡ መረጃውን ለመሰብሰብ በጥናቱ እንዲሳተፉ እንጋብዝዎታለን፡፡ በጥናቱ ለመሳተፍ ፍቃደኛ ከሆኑ የጥናቱን አላማ መገንዘብ እና የስምምነት ቅፅ መፈረም ይጠበቅብዎታል፡፡ የእርስዎን ጤና እንዲሁም በእርግዝና /ቅድመ ወሊድ ወቅት ያገኙትን አገልግሎት በተመለከተ ጥያቄዎችን እንጠይቅዎታለን፡፡ ይህም ቃለ-መጠይቅ በአማካይ 20 -25 ደቂቃ ይወስዳል፡፡

የጥናቱ ጉዳት፡ በዚህ ጥናት ላይ ሲሳተፉ ሊያጋጥሞት የሚቸለው ምንም አይነት አካላዊና ሰነልቦናዊ ችግር የለም ነገር ግን ቃለ-መጠይቁ የተሳታፊውን ጥቂት ጊዜ የሚወስድ ሊሆን ይችላል፡፡

የጥናቱ ጥቅም: አሁን ባለው ሁኔታ ምንም የሚያገኙት ጠቀሜታ ላይኖር ይችላል ነገር ግን እርሶ የሚሰጡን መረጃ የእናቶችን ሞት ለመቀነስ የምናደርገው እንቅስቃሴ በይበልጥ ይረዳናል፡፡ ይህንን መረጃ ተመርኩዞ ለወደፊቱ በሚመጣው ለውጥም አሰተዋጽአ ያደርጋሉ፡፡

ሚስጥራዊነት፡- ያለ ተሳታፊው እና ያለ ህግ ፈቃድ ማንኛውም መረጃ ለሶስተኛ ወገን አይተላለፍም፡፡ ተሳታፊዎች ስማቸውን እንዱጠቅሱ አይጠበቅም፡፡

የተሳታፊዎች መብት፡- ተሳታፊው በዚህ ጥናት ላይ የመሳተፍ ወይም ያለመሳተፍ መብቱ የተጠበቀ ነው፡፡ በመሳተፍ ላይ እያለ ቃለመጠይቁን በማንኛውም ሰዓት ማቋረጥ ወይም ከጥያቄዎቹ ውስጥ ለመመለስ የማይፈልጉትን ጥያቄ አለመመለስ ይችላል፡፡

የሚያነጋግሩት ሰው/አካል አድራሻ፡-በጥናቱ ዙርያ ምንም አይነት ጥያቄ ወይም ብዥታ ካለዎት እባክዎን የጥናቱን ተጠሪያ ነጋግሩ

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ለጥናቱ ውጤታማነት ሲባል በጥናቱ ላይ እንደሚሳተፉ ተስፋ እናደርጋለን፡፡

የስምምነት ቅጽ ከዚህ የተፃፈው መረጃ አንብቤው/ ተነቦልኝ/ እናም እዚህ ጥናት ላይ የመሳተፍም ሆነ ያለመሳተፍ ሙለ መብት እንዳለኝ ተረድቼ እና በማንኛውም ሰዓት የሚቀርብልኝ ጥያቄ የማቁረጥ እና ከሚቀርቡልኝ ጥያቄዎች መመለስ የማልፈልገው ማለፍ እንደምችል መብት እንዳለኝ እና ጥያቄም ካለኝ ማንን መጠየቅ እንዳለብኝ የተረደሁ በመሆኑ; በዚህ

ጥናት ውስጥ መሳተፌ በሙሉ ሚስጥር አንደሚጠበቅ የተረደሁ በመሆኑ የጥናቱ ተሳታፊ ለመሆን የተስማማሁ መሆኑን መሰማማቴን በፍርማዬ አረጋግጣለሁኝ፡፡

የተሳታፊ ፊርማ_____ ቀን _____

የመጠይቁ ሰብሳቢ ፊርማ_____ ቀን_____

በጥናቱ ላይ ስለተሳተፉ እናመሰግናለን!

መጠይቅ
በአማርኛ የተዘጋጀ ቃለ መጠየቅ
ኮድ ቁጥር _____

ማሳሰቢያ፡ ምርጫ ያላቸዉን መልሶችን ይከበቡ፤ ዝርዝር የሚያስፈልጋቸዉን በክፍት ቦታ ላይ ይጻፉ

ክፍል1.አሁኔ የሜጠያቆቴ ሰለ ኤሬሶና የቤተሰብ ባህርያት የተመለከተ ጥያቄዌኤኔ በተመለከተ ነዉ

ተ.ቁ	ጥያቄ	መልስ/ኮድ	እለፍ
101	እድሜ ለመጨረሻ ጊዜ የልደት በዓል ያከበሩት	_____ አመት	
102	ብሔር	1. አማራ……..1 2. ኦሮሞ……..……2 3. ትግሬ……....4 4. ሌላካለ……97	
103	ሃይማኖት	1. ኦርቶዶክስ----------1 2. ሙስሊም----------2 3. ፕሮቴስታንት----------3 4. ካቶሊክ----------4 5. ሌላ----------96	104
104	ሥራ	1. የቤትእመቤት---------- 1 2.የግልስራ----------2 3. የመንግስትስራተኛ----------3 4. የቀንሰነራተኛ---------- 4 5.የግብርናስራ---------- 5 6. ሌላ----------95	105
105	የትምህርት ደረጃ	1. ያልተማረ---------- 1 2. መጻፍና ማንበብ የሚችል-------2 3. የመጀመርያ ደረጃ (1-8)--------3 4. ሁለተኛ ደረጃ (9-10)----------4 5. የመሰናዶ ትምህርት(11-12)----5 6. ከፍተኛ የትምህርት ተቋም------6	
106	የጋብቻ ሁኔታ	1. ያገባ……..1 2. ያላገባ ግን አብሮ የሚኖር…….2 3. የተለያየ……..3 4. ባሏ የሞተበት…….4 5. ያላገባ……....5	3/4/5ከሆነወደ110 ይሂዱ
107	የባለቤትዎ የትምህርት ሁኔታ	1. ያልተማረ---------- 1 2. መጻፍና ማንበብ የሚችል-------2 3. የመጀመር ያደረጃ (1-8)--------3 4. ሁለተኛ ደረጃ (9-10)----------4 5. የመሰናዶ ትምህርት(11-12)---5 6. ከፍተኛ የትምህርት ተቋም -----6	
108	የባለቤትዎ ሥራ	1.የግል ስራ----------1 2. የመንግስት ስራተኛ----------2 3. የቀን ሰራተኛ---------- 3 4.የግብርናስራ---------- 4 5. ሌላ----------94	

109	ጋብቻ የፈጸሙበት እድሜ	_____	
110	አማካኝ የቤተሰብ የወር ገቢ መጠን	_____ የኢትዮጵያ ብር	
111	የቤተሰብ ብዛት	_____	
112	እቤት ውስጥ ትልልቅ ውሳኔዎችን የሚወሰነው ማነው	1. እኔ---------- 1 2. ባለቤቴ---------- 2 3. በጋራ----------3 4. ሌላ----------93	

ክፍልሁለት፡- ስነ-ተዋልዶ የተመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄ	መልስ/ኮድ	እለፍ
201	በህይወት ዘመንዎ ስንት ጊዜ አርግዘዋል ያውቃሉ(በህይወት የሌሉትን ጨምሮ)?	_____	
202	የመጀመርያውን ልጅዎትን ሲወልዱ ስንት አመትዎ ነበር?	_____	
203	ከአሁኑ እርግዝና ውጪ ስንት ልጆች አልዎት?	_____	0 ከሆነ ወደ 207ይሂዱ
204	ከዚህ በፊት በነበረው እርግዝና ወቅት ያጋጠሞት ዉጤቶች?	1. ውርጃ_____ 1 2. በህይወት ያለ ልጅ_____ 2 3. በህይወት የሌለ ልጅ_____ 3 4. ሌላ_____ 4	
205	ከዚህ በፊት በነበረው እርግዝና ወቅት የእርግዝና ክትትል አድርገው ነበር?	1. አድርጌያለሁ 2. አላደረኩም	
206	ከዚህ በፊት ባለዎች ክትትል ወቅት የአልትራሳውንድ ምርመራ አድርገዋል?	1. አድርጌያለሁ 2. አላደረኩም	
207	በአሁኑ እርግዝናዎ ስንት ጊዜ የቅድመ ወሊድ ክትትል አድርገዋል?	1. አንድጊዜ 2. ሁለትጊዜ 3. ሶስትጊዜ 4. አራትጊዜ 5. ሌላ	
208	የአሁኑ እርግዝና አሁን ስንተኛው ወር ላይ ነው?	_____	

ክፍልሦስት በወሊድ ዝግጅትና ሊያጋጥሙ የሚችሉ ችግሮች ላይ ያለዝግጁነት

ተ.ቁ	ጥያቄ	መልስ/ኮድ	እለፍ
301	በእርግዝናዎ ጊዜ ሊያጋጥሙ የሚችሉ ችግሮችን ያውቃሉ?	1. አዎ 2. አላውቅም	መልስዎ አላውቅም ከሆነወደተ.ቁ305
302	የሚያውቁትን ሊገልጹልን ይችላሉ?	1. ከብልት ውስጥ ደም መፍሰስ 2. ከብልት የሚወጣ ሌላ ፈሳሽ 3. ከባድ የራስ ምታት 4. የአይን ብዥታ 5. ከባድ የሆድ ህመም 6. የፊትና የእጅ ማበጥ 7. ትኩሳት 8. የህጻኑ እንቅስቃሴ መቀነስ/መብዛት 9. ቶሎቶሎ መድከም/ትንፋሽ ማጠር 10. ሌላ ----------	
303	እነዚህ አደገኛ ምልክቶች ለሞት ሊያጋልጡ ይችላሉ ብለው ያሰባሉ?	1. አዎ 2. አላስብም	
304	የትኛዎቹ ምልክቶች ለሞት ሊያጋልጡ ይችላሉ ብለው ያሰባሉ?	1. ከብልት ውስጥ ደም መፍሰስ 2. ከብልት የሚወጣ ሌላ ፈሳሽ 3. ከባድ የራስ ምታት 4. የአይን ብዥታ 5. ከባድ የሆድ ህመም 6. የፊትና የእጅ ማበጥ 7. ትኩሳት 8. የህጻኑ እንቅስቃሴ መቀነስ/መብዛት 9. ቶሎ ቶሎ መድከም/ትንፋሽማጠር 10. ሌላ ----------	
305	የወሊድ ዝግጁነት ሲባል ሰምተው ያውቃሉ	1. አዎ 2. ሰምቼ አላውቅም	
306	እንዴት ሊሰሙቻሉ	1. ከጤና ባለሙያ……1 2. ከህብረተሰብ ጤና ሰራተኞች…….2 3. ከጤናኤክሰትንሽን ሰራተኞች…...3 4. ከአዋላጅ ነርስ……4	

		5. ከቤተሰብ……5 6. ሌላ……97			
			1.አው	2.አይ	ለሁሉም መልስ ስይሰጥ
307	በቅድመ ወሊድ ክትትል ጊዜ ምንምን ነገሮች ላይ ተወያያቹ	1. አደገኛ ምልክቶች			
		2. ስለጡት ማጥባት			
		3. አደገኛ እጻጉዳቴና ስለጎጂ ልማዳዊ ድርጊቶች			
		4. ሰለ የግል ንጽህናና ጽዳት			
		5. የቤተሰብ ምጣኔ			
		6. በወሉድ ዝግጅትና ሊያጋጥሙ የሚችሉ ችግሮች ዝግጁነት			
		7. ስለሚቀጥለው ቀጠሮ			
		8. ሌላ……97			

ክፍልአራት፤- ቅድመ ወሊድ እና የተወሳሰቡ ችግሮች ላይ ዝግጁነት

ተ.ቁ	ጥያቄ	መልስ/ኮድ	እለፍ
401.	የሚወልዱበትን ቀን ያውቃሉ	1. አዎ 2. አላውቅም	
402.	የሚወልዱበትን ቦታ መርጠዋል	1. አዎ 2. አላውቅም	
403.	በወሊድ ጊዜ የሚጠቀሙበትን ብር አዘጋጅተዋል/ አጠራቅመዋል	1. አዎ 2. እይ	
404.	የሚወልዱበትን ቦታ ወስነዋል	1. አዎ 2. እይ	
405.	የድንገተኛ የማስጠንቀቂያ ምልክቶችን መለየት ያውቃሉ/ይለያሉ ?	1. አዎ 2. አዬ	
406.	ድንገት ምጥ ቢመጣ ገንዘብ አዘጋጅተዋል ?	1. አዎ 2. እይ	
407	የትራንስፖርት አገልግሎት ለመጠቀም ወስነዋል	1. አዎ	

.		2. አልወሰንኩም	
408.	ደም ለጋሽ አግኝተዋል /አዘጋጅተዋል	1. አዎ 2. አላዘጋጀሁም	

ክፍልአምስት፡- የአልትራሳውንድአጠቃቀም

ተ.ቁ	ጥያቄ	መልስ/ኮድ	እለፍ
501.	ከዝህ በፍት ባሉት እርግዝና የአልትራሳውንድ ምርመራ አድርገውል	1. አዎ 2. አላደረኩም	የመጀመርያ እርግዝና ከሆነ ያለፉት
502.	በዝህኛው እርግዝና የአልትራሳውንድ ምርመራ አድርገውል	1. አዎ 2. አላደረኩም	አላደረኩም ከሆነ ወደ 509
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505.	በየትኛው ሦስት ወር ጊዜ ውስጥ ነው የአልትራሳውንድ ምርመራው ያደረግሽው	1. በአንደኛው 2. በሁለተኛው 3. በሦስተኛው	

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Research Publications Office in effect at the time of grant is forwarded as the result of this application.

Name of the student: _____Rediate Sileshi____

Date: _____Signature _____

Approval of the Advisors

Name of the advisors: MESELECH ASSEGID Date: _____ Signature _____