

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF ALLIED HEALTH SCIENCE
DEPARTMENT OF NURSING AND MIDWIFERY

**PREVALENCE OF CAESAREAN SECTION AND ASSOCIATED
FACTORS IN ADDIS ABABA HOSPITALS, ADDIS ABABA,
ETHIOPIA, 2017**

BY: HIWOT TSEGAYE (BSc)

**A RESEARCH THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE
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ADDIS ABABA, ETHIOPIA

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List of Abbreviations

ANC	Antenatal Care
APH	Ante partum Hemorrhage
C/D	Cesarean Delivery
CPD	Cephalo Pelvic Disproportion
CS	Cesarean Section
CSR	Cesarean Section Rate
EDHS	Ethiopia Demographic Health Survey
MCH	Maternity and Child Health
NRFHR	Non- Reassuring Fetal Heart Beat
OP	Operative
SSA	Sub- Sahara Africa
SPSS	Statistical Package for Social Science
VD	Vaginal Delivery
VBAC	Vaginal Delivery after Caesarean
WHO	World Health Organization

Abstracts

Background: Caesarean section is one of life saving procedures medical intervention attributed to the decrease of the maternal mortality and morbidity rates. The initial purpose of the surgery was to preserve the life of the mother with obstructed labor, but indications have expanded over the years to include delivery for a variety of more subtle dangers to the mother or fetus. The World Health Organization (WHO) suggests a cesarean rate between 5% and 15%. However, the rate in Addis Ababa city is beyond aforementioned level.

Objective: To determine the prevalence and associated factors of caesarean section in Addis Ababa Hospitals, Addis Ababa, Ethiopia, 2017.

Methods: Institutional based cross- sectional study was conducted from April 10 to May 10, 2017 in selected Addis Ababa hospitals. The total sample size was 298. The data was collected by using structured check list and questionnaire by interviewing women's who gave birth in selected hospitals and record document was reviewed. Data were entered and analyzed using SPSS version 20 statistical package. Both binary and multiple logistic regressions were used to assess the association between prevalence and explanatory variables of caesarean. Finally, the data were described and presented using tables. A 95 % confidence interval and 5% level of precision was utilized to check for association between variables.

Result: The overall prevalence of CS in Hospitals in Addis Ababa was 38.3%. Private health facilities performed more CSs than public health facilities, 46.9% and 34.0% respectfully. The common indication of Caesarean section in the study area was Previous CS (27.2%) which was followed by NRFHR (21.0%) and post term (15.6%). Factors such as maternal age (AOR 0.47, 95%CI (0.278, 0.792), education (AOR 3.456, 95%CI (1.109, 10.764) and gestational age (AOR 0.265, 95%CI (0.078, 0.899) were associated factor for CS.

Conclusion and Recommendation: The prevalence of CS was higher than the WHO recommendation in the study area. Previous CS and NRFHR were the leading indication in this study. Therefore, encourage trial of vaginal birth after CS in appropriate cases and time given for conservative management of fetal distress rather than rushing to operation theatre with a single episode of fetal heart rate abnormality are recommended to decrease caesarean section.

- key words: prevalence ,caesarean section

1. INTRODUCTION

1.1 Background

Caesarean section (CS) is an operative procedure where by the fetuses after the end of 28th weeks is delivered through an incision on the abdominal and uterine walls [1].

Caesarean section is one of life saving procedures medical intervention attributed to the decrease of the maternal mortality and morbidity rates. The initial purpose of the surgery was to preserve the life of the mother with obstructed labor, but indications have expanded over the years to include delivery for a variety of more subtle dangers to the mother or fetus. Contributing to its more frequent use is its advances in medical knowledge over time; improvements in anesthetic techniques, infection control, and availability of blood transfusions have made Caesarean section to be a relatively safe operation to perform [2].

In the world now 1 in 5 women give birth by caesarean section. The global caesarean section rate is distributed very unevenly and results 18.6%. Latin America and the Caribbean region has the highest CS rates 40.5%, followed by Northern America 32.3%, Oceania 31.1%, Europe 25%, Asia 19.2% and Africa 7.3%, which is a weighted average between 3.5% in sub-Saharan Africa and 27.8% in Northern Africa [3].

The World Health Organization (WHO) has recommended a Caesarean section rate of between 10 and 15% (average 12.5%) as an acceptable level [4]. Despite this recommendation, evidences suggest that the rates of CS are high in developing countries and are increasing, with wide variation between countries and between regions of the same country [5].

In Ethiopia, the national population based caesarean delivery rate of is 0.6% with variation between the regions from 0.2% to 9% and the overall institutional rate was 18%, which varied between 46% in the private for- profit sector and 15% in the public sector [6].

1.2 Statement of problem

The caesarean section rate has become more prevalent over the years without a clear medical justification and regardless it is associated with an increase in morbidity and mortality of mothers and children. Caesarean is associated with adverse effects such as: maternal death, emergency hysterectomy, thromboembolic events, wound infections, reduced fertility, prolonged hospital stay with greater number of hospital readmissions, problems with physical recovery and chronic pelvic pain. Adverse effects to the newborns are less well documented; but the evidence suggests an increase of the respiratory distress syndrome after a caesarean [7]. In a normal pregnancy, CS has eight fold higher maternal mortality than vaginal delivery, in addition to 8-12 times higher morbidity [8].

In a developing country an increase in the CSR has major implications on the limited health care resources. A caesarean delivery is associated with a longer length of hospital stay and a higher occupancy proportion of rooms for the hospital; higher occupancy rate above a certain threshold can lead to reduced patient satisfaction, increased stress on staff and resources, and increase costs to ensure safe practice. Additionally, the medical impact of rising rates of caesarean delivery on both short-term and long-term maternal and neonatal outcomes, and the associated costs of associated morbidities needs to be taken into account [9].

Findings from previous studies indicated medical and nonmedical factors that are likely to be associated with the rising rate of CS includes age, maternal income, parity, maternal educational status, previous caesarean section, induction of labor [5]. Some others revealed that it is associated with place of health seeking (private with public) and maternal preferences [10].

Caesarean section is increasing in Ethiopia, indicative of access to obstetric care service in the country. In the urbanized region of the country, the rate ranges from 8 to 37%. The increment in caesarean section rate in major urban cities is a cause of concern as it surpasses the WHO threshold of 15 % [10].

According to the 2014 EDHS (Ethiopian demographic and health survey) the national CS delivery rate in Ethiopia was 2.1 %, with regional rates varying from 0.5% in Amhara to 22.9 % in Addis Ababa. The CS rate in Addis Ababa increased significantly from 2.3% in 1995–1996 to

24.4% in 2009–2010. From 2003 onwards, it persisted above 15% [5]. EDHS 2014, 2011 and 2005 reported CS rates in Addis Ababa 22.9, 21.8% and 16.0% respectively. It signifies the possibility of over-utilization of the service in the city [11-13].

In many developed countries, caesarean sections are increased and attention has focused on strategies to reduce its use do to the concern that higher caesarean section rates do not confer additional health gain but may increase maternal risk, have implications for future pregnancies and have resource implications for health service [3].

In March 2014, the American College of Obstetricians and Gynecologists, and the Society for Maternal –Fetal Medicine, called for police change to safely lower the rate of primary caesarean delivery [14]

In Brazil, the government has attempted administrative, managerial, educational and technical measures, without success, to control the high caesarean rates especially in the private sector, where the rates are even higher than in the public service [15]. But in our country the increase of CS was not given emphasis.

The researcher, who has an interest in women’s health, observed during her Obstetrics work experience, that caesarean sections were performed rather frequently. She became concerned about the frequency of caesarean sections and associated factors for the caesarean sections.

Most previous studies done on prevalence of caesarean section and until now little has been known about factors that associated with increase caesarean section. Therefore it is important to understand the factors that drive the high caesarean section rates in order to put in place interventions to reduce the rate.

The aim of this study is to assess prevalence of caesarean section and associated factors in Addis Ababa hospitals, Addis Ababa, Ethiopia.

1.3 Significance of the study

Caesarean section can be life saving intervention for mother and baby when vaginal birth is contraindicated. However, it is associated with increased morbidity and mortality and may impact negatively on a woman's future reproductive health. Birth by caesarean section also places extra demands on maternity services and provision of resources. So decreasing CS rate is one way of prevention of maternal and neonatal morbidity and mortality. Identifying the prevalence and associated factors of caesarean section would help to have a broad and recent picture on the problem and provide some knowledge and insight in to the prevalence and associated factors of caesarean section in Addis Ababa Ethiopia. Additionally, the finding of this study will benefit for policy makers and service providers by providing important information for decision making on service provision and utilization.

2 Literature Review

2.1. Prevalence of caesarean section

The global rate of CS according to the most recent estimation from 150 countries was found to be 18.6% of all birth by CS, range depending on region, between 6 and 27.2 %, and rising at an average rate of 4.4 % per year. The lowest rates were found in Africa (7.3 %), followed by Asia (19.2 %), Europe (25 %), Oceania (31.1 %), and North America (32.3 %), with Latin America and the Caribbean having the highest rates at 40.5 % . While all the other regions showed an increase in CS, there was a small, but real increase in the CS rates in sub-Saharan Africa (SSA) over that time period, as well [3].

The study done in Mexico, the prevalence of CS was 57.3 % [7]. A descriptive cross sectional study conducted in Pakistan teaching hospital showed that a total of 1149 pregnant females were included in the study, 246 females underwent caesarean section. The caesarean section prevalence was 21.40% [16]. A cross-sectional study performed at the university hospitals of Niknafs and Ali-IbnAbiTalib of Rafsanjan, Iran, in the second trimester of 2014, showed that from 1751 births were conducted and among these cases, 921 cases were CS (52.6%) and 830 (47.4%) were natural deliveries [17]. A retrospective study done in government maternity hospital in India 2014 showed that from 8121 eligible mother 6037 had normal vaginal delivery and 2084 (25.66%) mother had CS delivery [18]. Other retrospective study done in maternity hospital at Albania, from 13,483 given birth 4357 were by CS (32.3%) [19].

Two years a cross-sectional study carried out in a tertiary hospital in Northwestern Nigeria: the caesarean section rate was 11.3% (504/4462) of total deliveries [20]. An analytic study conducted at Tanzania St. Joseph Medical Hospital; the prevalence of CS was 18% [21]. The study done at Felegehiwot referral hospital, Northwest Ethiopia among the 2967 eligible mothers 25.3 % had CS delivery [22]. Institution based cross sectional study was conducted at MizanAman General Hospital prevalence of caesarean section were 21.1% [23].

Another cross-sectional study was conducted in private and government hospitals in Harar town showed that the overall prevalence of CS 34.3% [24]. Hospital based cross sectional study done at Chiro Zonal Hospital, West Harergaerate of caesarean delivery was 18.2% [25]. Cross-

sectional retrospective study was conducted in Attat Hospital; Gurage zone SNNPR, Ethiopia, showed that rate of CS is 27.6% [26].

According to the study conducted at caesarean delivery practices in teaching public and nongovernment/private MCH hospitals, Addis Ababa, compared the rate of CS in public and private for profit hospitals, the CS rate 31.1% in public hospitals and 48.3% in private hospitals [27].

2.2 Associated Factors

2.2.1. Indication of caesarean section

The study done in Pakistan teaching hospital, results showed that out of 246 caesarean sections, 95 caesarean sections (38.6%) were performed electively while 151 caesarean sections (61.35%) were performed on emergency basis. Previous caesarean section was the most frequent indication (22.76%). After that failed progress of labour (18.29%) fetal distress (15.44%) and breech presentation (14.25%) [16].

The study conducted in the university hospitals of Niknafs and Ali-IbnAbiTalib of Rafsanjan, Iran, in the second trimester of 2014, showed that the most common causes were repeated caesarean section (52.9%), elective CS (on maternal request) (7.5%), meconium stained (6.1%), fetal distress (5.0%), and breech presentation (4.5%)[17].

A retrospective study done in government maternity hospital in India 2014 showed that from 8121 eligible mother Primary emergency CS contributed to 44.48% followed by repeat elective CS (26.15%). Fetal distress was the commonest indication for primary emergency CS followed by CPD and big baby. CPD with pelvic abnormalities and big baby contributed to 50% of elective caesarean sections [18].

The study conducted in maternity hospital at Albania the most frequent indication were previous caesarean section birth (36.5%), fetal suffering (13.9%), premature rupture of membrane (9.8%), preeclampsia (9.2%)[19].

According to a Medicins sans Frontiers multi-country analysis conducted in sub-Saharan Africa, reports that the indications for CS were obstructed labor (31 %), malpresentation (18 %), prior

caesarean section (14 %), fetal distress (10%), uterine rupture (9 %), and antepartum hemorrhage (8 %) [28].

Two years a cross-sectional study carried out in a tertiary hospital in Northwestern Nigeria to assess the overall caesarean section (CS) rate, indications and outcomes, the most common indications for emergency CS were prolonged obstructed labor 25.7% (30/288) and preeclampsia/ eclampsia 10.7% (31/288). Previous CS was the most common indication for elective CS 39.8% (86/216), followed by breech at term 17.6% (38/216) [20].

The study conducted at Tanzania St. Joseph Medical Hospital the common indication overall for CS were prolonged or obstructed labour, it counted for 30 %. The most common indication among nulliparous was prolonged or obstructed labour, and the most common indication for multiparous women was previous CS. Malpresentation of the baby (20%), and fetal distress (11%), were also commonly used as indications [21].

The study done at Felegehiwot referral hospital, Northwest Ethiopia, among the 2967 eligible mothers, the majority (90.3 %) of these women had emergency CS and referred cases were responsible for the higher (79 %) proportion of emergency CS in this study. The most frequent indication was obstructed labor 30.7 % followed by fetal distress 15.9 %, abnormal presentation 13.4 %, previous CS scar 7.9% and failure to progress 6.8% [22].

Hospital based cross sectional study done at Chiro Zonal Hospital, West Hararge, the leading indication for caesarean delivery were previous caesarean section (20.3%), None reassuring fetal heart rate pattern (16.2%), obstructed labour (12.2%), malposition/malpresentation (other than breech presentation) (12.2%) and antepartum hemorrhage(10.8%). Maternal indication constitutes 64.9% whereas fetal indication accounts 35.1% [25].

Cross-sectional retrospective study was conducted in Attat Hospital, Gurage zone SNNPR, the leading indications for caesarean birth were, Cephalopelvic Disproportion (CPD) (38.1%), previous Cs (18.9%), fetal distress (12.5%), mal-presentation and malposition (7.1%), and Antepartum Hemorrhage (APH) (6%) accounting for 82.6% of the indications for caesarean section. Maternal indications constituted 68% whereas fetal indications accounted for 32% [26].

The study conducted in Addis Ababa teaching public and non-governmental MCH hospitals of 2011 G.C; the three major indications for caesarean section in the teaching hospitals were non-reassuring fetal heart rate pattern (NRFHRP), previous one caesarean section scar and cephalopelvic disproportion (CPD), each contributing to (26.3%), (14.6%), and (10.4%), respectively. The leading indications in the non-governmental hospitals were: previous one caesarean section (29.7%), NRFHRP (17.8%), and CPD (12.5%) [27].

2.2.2 Socio-demographic factors

A systematic review was conducted using published 22 articles were included from eighteen different countries observed that the majority of caesarean deliveries were in women between the 30 and 40 years old [8]. The study done in Japanese showed that caesarean delivery rates a significant increase in the advanced maternal age (≥ 35 years) [29]. Cross-sectional analysis of data from Bangladesh, India and Nepal revealed that higher maternal age was associated with increased odds of caesarean section in urban India [30]. A cross-sectional survey conducted in Addis Ababa found women older than 30 years are more likely to have CS delivery compared to younger ones (aged 15–24) [31]. However, the study was made based on the three Ethiopia Demographic and Health Surveys (EDHS) data (EDHS 2000, 2005 and 2011), the CS rate did not show significant variation across the categories of maternal age [5].

The study done using published 22 articles were included from eighteen different countries showed that a direct proportional relationship between caesarean section and a higher educational level [8]. Cross-sectional analysis of data from Bangladesh, India and Nepal showed that maternal education was associated with increased odds of caesarean delivery in rural Bangladesh and urban India, mothers with secondary education or Bachelor degrees having higher odds [30]. The study was made based on the three Ethiopia Demographic and Health Surveys (EDHS) data (EDHS 2000, 2005 and 2011), the CS rate increases with rise in maternal education and household wealth index [5].

The study was conducted using published 22 articles were included from eighteen different countries showed in Mexico, it was concluded that women within the medium and high social classes were attend only in private hospitals and 85.07% of these women underwent to a CS. In Brazil, demonstrate that women attended in public hospitals had lower per capita family income,

with a 49.5%, representing $<1/2$ of the minimum wage. In Iran the caesarean rate in economically active women was significantly higher than in non- active women in urban areas, also in Iran studied that the higher husband's income level was associated with an increase in request for CS [8]. A cross-sectional study was conducted in private and government hospitals in Harar town revealed that higher family income was positively and significantly associated with CS delivery [24]

2.2.3 Obstetrics risk factors

The study conducted in South West Iran revealed that women's who had two or more parities and 1 or 2 alive children have high probability to perform CS and also women who had previous miscarriages and still births(65.49%), as well as previous infertility (76.71%) [30]. According to study conducted in Eastern Ethiopia, in Harar , showed that previous CS delivery, parity of three or more, fetal birth weight of greater than 4000 g, private hospital delivery, and private clinic/hospital ANC visit were found significantly associated to caesarean section delivery [24]. The study done at Felegehiwot hospital revealed that caesarean section was 9.80 higher if the woman had abnormal presentations. Similarly women having history of previous caesarean section and fetal weight of 4000gm were 3.93 and 13.68 times more likely to give birth by caesarean section [22]. The study was made based on the three Ethiopia Demographic and Health Surveys (EDHS) data, the CS rate declines with increasing parity. The highest rate of 26.5% was reported among primiparous women. The corresponding figures for multiparous and grand-multiparous were 19.2% and 11.4%, respectively [5].

2.2.4 Place of Delivery

The study was made using published 22 articles were included from eighteen different countries showed that the rate of caesarean delivery was higher at the private hospitals than in the public ones, reaching an alarming percentage. The study conducted in Mexico showed that difference in the caesarean section rate among public and private hospital is significantly different being the caesarean section much more common in private hospitals [7]. Cross-sectional analysis of data from Bangladesh, India and Nepal revealed that delivering in a private health facility was associated with increased odds of caesarean section [30]. A cross-sectional study was conducted in private and government hospitals in Harar town revealed that private hospital delivery and

private clinic/hospital ANC visit were found significantly associated to caesarean section delivery [24]. The study was made based on the three Ethiopia Demographic and Health Surveys (EDHS) data (EDHS 2000, 2005 and 2011), the CS rate among women who delivered in private health facilities (41.7%) was twice increased as compared to women who gave birth in the public health facilities (20.6%) [5].

Generally different studies in different countries showed that factors that associated with high CS. However Limited numbers of researches are done on prevalence of CS and associated factors in our country including Addis Ababa while searching in different journals. Conducting a study on factors associated with higher CSR will help to fill partly the existing gaps.

2.5 Conceptual Framework

Based on review of literature done in Ethiopia and other part of the world caesarean section affected by socio demographic factors, obstetric factors, place of delivery and clinical indication.

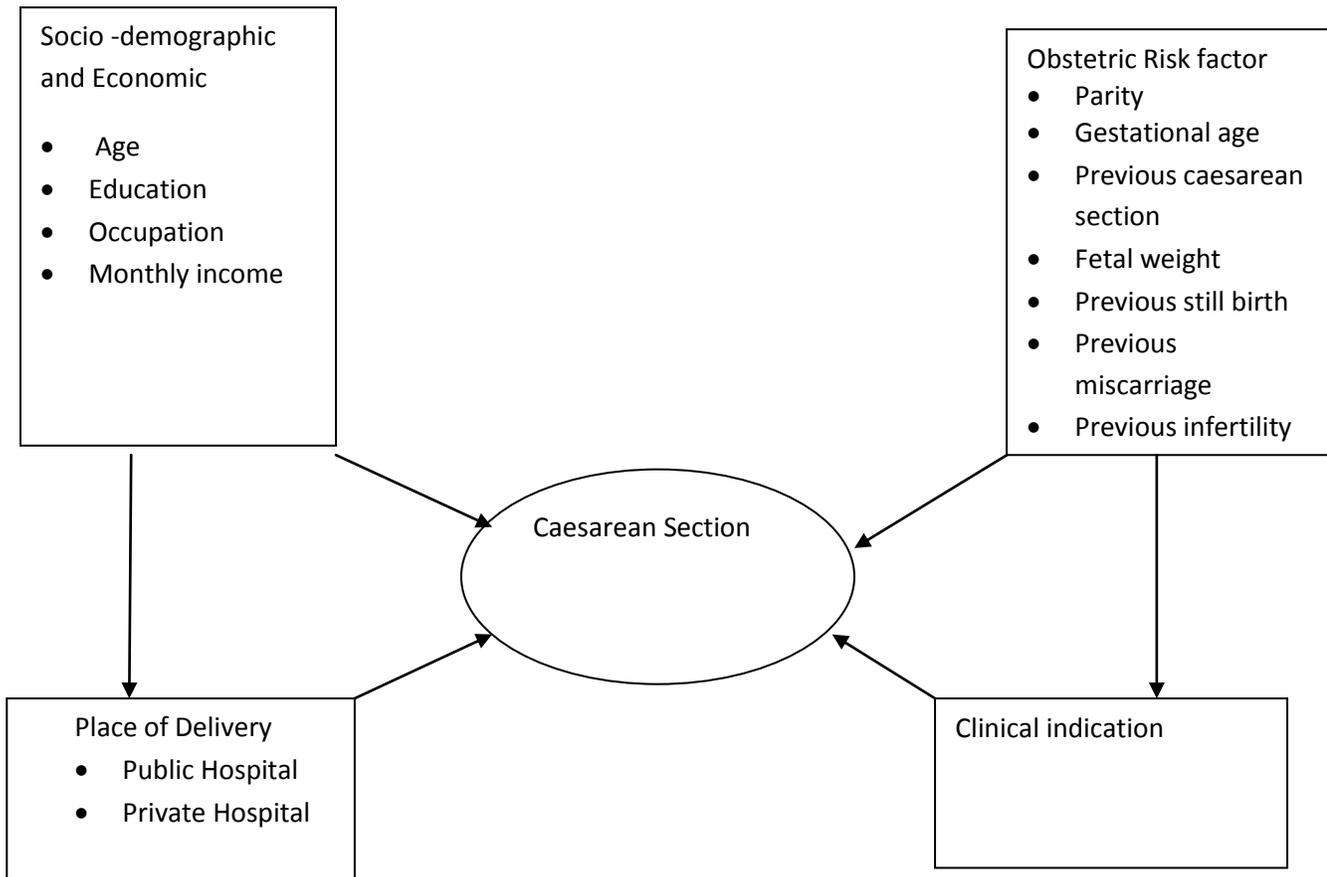


Figure2-1: Conceptual Framework on Prevalence and associated factors of caesarean section. It adopted and modified from Ghosh, 2010 (8, 24, 29, 33)

3 OBJECTIVES

3.1 General objective

To assess the prevalence and associated factors for caesarean section in Addis Ababa Hospitals, Addis Ababa, Ethiopia, 2017.

3.2. Specific objective

- ✓ To assess the prevalence of caesarean section in Addis Ababa Hospitals.
- ✓ To identify the associated factors for caesarean section in Addis Ababa Hospitals.

4. Methodology

4.1. Study area and period

The study was conducted in Addis Ababa, the capital city of Ethiopia and is located in the heart land of the country with a total area of 527 km². This region has an estimated density 5,535.8 people per square kilometer. Based on 2007 figure from Central Statistics Agency of Ethiopia, Addis Ababa has an estimated total population of 3.2 million projected for the year 2014 [34]. The city has ten sub city and 116 woredas. There are 51 hospitals of which 6 are owned by Addis Ababa City Administration Health Bureau, 4 by Federal Ministry of Health, 1 by Addis Ababa University, 3 by Nongovernmental organization, 3 by Defense Force and Police and 34 by private owners. Out of those 10 of them are MCH hospitals. There are about 84 health centers and around 700 private clinics out of which 75 are higher Clinics. This study was carried out among the mother's who gave birth in the selected hospital (three government hospitals and three private MCH hospitals and one nongovernment MCH hospital) from April 10 to May 10, 2017.

4.2. Study design

An institution based cross- section study was conducted.

4.3. Source population

Women who gave birth in Addis Ababa hospitals in study period.

4.4. Study population

Women who gave birth in selected Addis Ababa Hospitals in study period which fulfill the inclusion criteria.

4.5. Eligibility criteria

4.5.1. Inclusion criteria

- Women who gave birth after gestational age of viability (28 week) and willing to participate in selected Addis Ababa hospitals in the study period.

4.5.2 Exclusion criteria

- Any patient cards which did not have full information were excluded.

4.6. Sample size Determination

Sample size was determined by using single population proportion by the previous known magnitude of CS was 22.9 %; it is taken from EDHS 2014 Addis Ababa CS, 95% confidence level, 5% margin of error.

P =22.9 %

Confidence level of 95% was specified

Degree of precision (allowed deviation from the true proportion in the population as the whole) or Margin of error will be 5%.

$$n = Z^{2\frac{\alpha}{2}} \left(\frac{p(1-P)}{d^2} \right)$$

Where n= sample size

p= 22.9%

d=marginal error between sample and population (0.05)

Z $\alpha/2$ = critical value at 95% confidence interval

$$n = 1.96*1.96*0.229*(1-0.229)\0.05*0.05=271$$

Considering non response rate of 10%

The total sample size was 271*10 %(response rate)

n =298 women

4.7. Sampling procedure

The health institution selected for this study were three hospitals from government hospital and three from private MCH hospitals and one nongovernment MCH hospital. These study sites were selected by simple lottery method. The total sample size was proportionally allocated for seven hospitals based on the three month delivery rate of each hospital. The study participant was selected from the list of delivery registration book by using systematic random sampling method. The interval “k” was used to select the study participant from the sample frame which was previous month registration in each hospital.

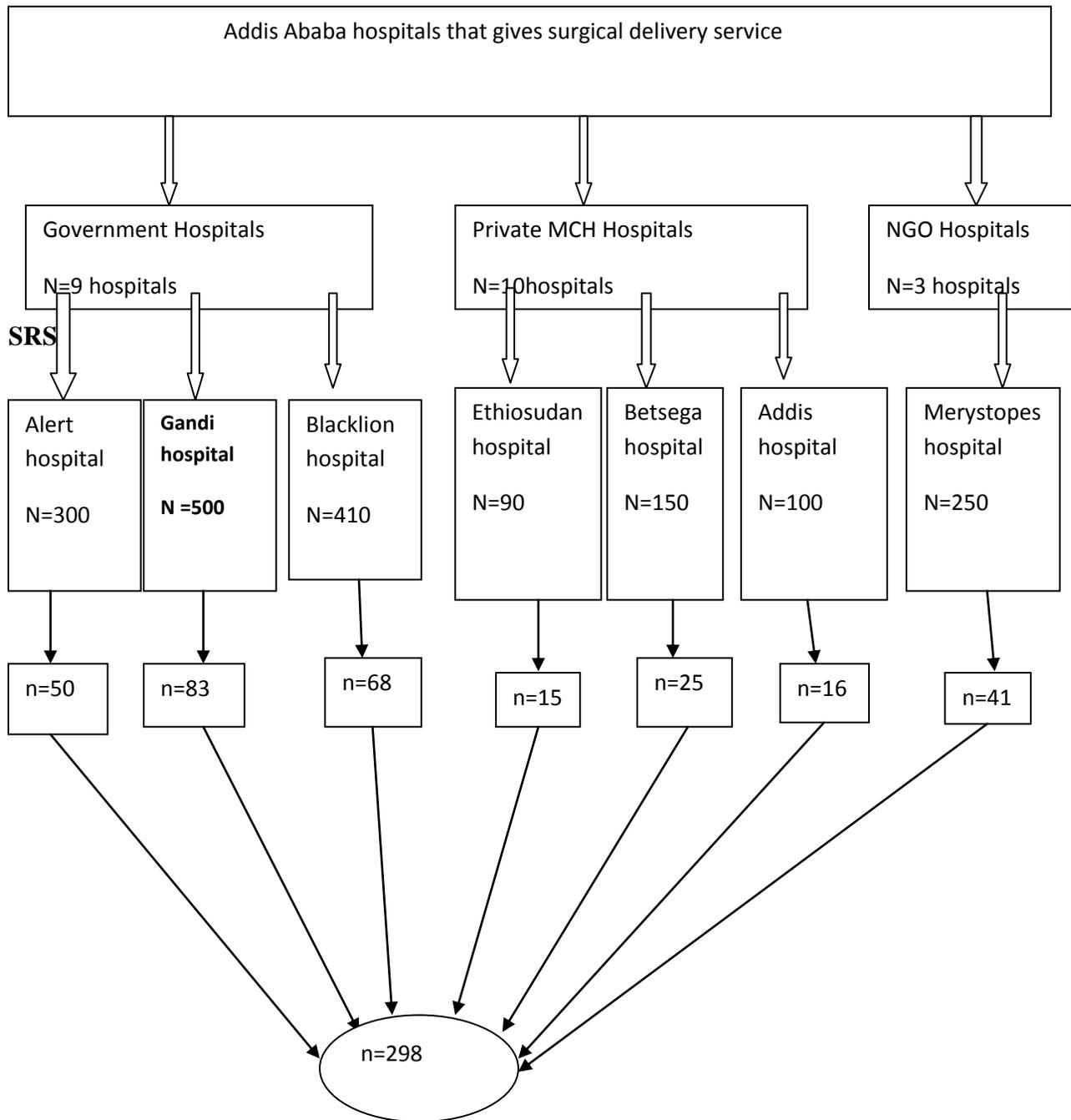


Figure 2: Schematic presentation of the sampling procedure of prevalence of caesarean section and associated factor in Addis Ababa.

4.8 Variables

4.8.1. Dependent variable

Caesarean section

4.8.2. Independent Variables

Socio-demographic factor

Obstetric factor

Place of deliver

Clinical indication

4.9. Operational definitions

Prevalence of caesarean section -is the proportion of caesarean sections performed in a hospital to the total number of live births in a study area.

4.10. Data Collection Tool

Data was collected using structured Amharic interview questionnaire and questionnaire checklist by review client chart. The questionnaire and checklist were adapted through reviewing of different literatures and previous similar studies. The questionnaire was prepared in English, translated into Amharic and then translated back in to English to check for consistency and the check list prepared in English. Main points included in the questionnaire and checklist was socio demographic characteristics, obstetric history and outcome of caesarean section.

4.11. Data Collection Procedure

Data was collected from April 10 to may 10 2017, to administer the structured questionnaire and checklist 7 BSc midwives as data collector and one senior BSc midwives as supervisor was recruited and training was given for one day on the objective, relevance of the study, confidentiality of information, respondent rights, Informed consent, and technique of interview. The participant was interview after they gave birth and stable to communicate.

4.12. Data Quality Assurance

In order to maintain quality of the data, data collectors and supervisors were trained in data collection procedures. Before actual data collection time the questionnaire (tool) was pretested for validity and reliability on 5% of sample size in TiruneshBejing hospital and Ethiotebib hospital, there by possible adjustment or modification was made on the tool. Completeness of data was checked daily and coded before data entry.

4.13. Data processing and analysis

The data collected from the hospitals was checked and entered, after being encoded and analyzed using SPSS version 20 statistical packages. All the data obtained from the study population was entered, cleaned and analyzed by the principal investigator. To explain the study population in relation to relevant variables descriptive statistics was used. To identify the existence of association between the dependent and independent variables, bivariate and multivariate logistic regression with 95% C.I and $p < 0.05$ was used.

4.14 Ethical Consideration

Ethical approval was obtained from the Institutional Review Board of Addis Ababa University college of Health science, school of allied health science department of nursing and midwifery and Addis Ababa City Administration Health Bureau Public health research and emergency management core process. Informed verbal consent was obtained from each respondent after explaining the purpose and Procedure of the study. In order to keep confidentiality of any information provided by study subjects, the data collection procedure was anonymous. Participation was on voluntary basis and they could withdraw from the study at any time of data collection. No name or other identifying information was included in the instrument.

4.15. Dissemination of Results

The final result of this paper will submitted to Addis Ababa University, School of Health Science Department of Nursing and Midwifery Postgraduate Program and Addis Ababa City Administration Health Bureau Public health research and emergency management core process.

Besides, there presentation of the research outputs to the university community and other concerned stakeholders. It will also be prepared and sent for publication to peer review.

5 RESULTS

5.1 Socio demographic characteristics

All of 298 sampled mothers were enrolled in the study making participation rate of 100%. The age of the study participants ranged from 19-38 years. The majority of participants 195(65.4%) were between 20-29 years old with the mean age of the study participants was 27.88 years (+_4.721SD).The majority of participants 286 (96.0%) were married. As to the educational status of respondent 107(35.9%) were college diploma and above while, 86(28.9%) and 81(27.2%) attended secondary and primary level respectively. The rest 24(8.1%) were illiterates. Concerning the occupation of the respondents 163 (54.7%) were housewives. The average monthly family income was 6786.00 birr [Table 1].

Table 1: Sociodemographic characteristics of women who gave birth in public and private hospitals, Addis Ababa, Ethiopia 2017

Variable	Frequency	Percentage (%)
Age n=298		
15-19	4	1.3
20-24	67	22.5
24-29	128	43.0
30-34	66	22.1
35-39	33	11.1
Marital status n=298		
Married	286	96.0
Single	5	1.7
Separate	1	0.3
Divorce	5	1.7
Widowed	1	0.3
Educational status n=298		
Illiterate	24	8.1
Primary(1-8)	81	27.2
Secondary(9-12)	86	28.9
College diploma & above	107	35.9
Occupation n=298		
Housewife	163	54.7
Government employee	53	17.8
NGO	6	2.0
Merchant	43	14.4
Daily labor	11	3.7
Private employee	19	6.4
monthly income n=298		
= <1000	6	2
1001-3000	91	30.5
3001-5000	76	25.5
5001-7000	40	13.4
>7000	85	28.5

5.2. Obstetric characteristics

Out of total study subjects (298), more than half 169(56.7%) were between gravid II-IV followed 122(40.9%) of the mothers were primigravida and 7(2.3%) were grand multi. About 145(48.7) were prime para followed by 133(44.6%) para two, 16(5.4%) para three and 4(1.3%) were para four and above. Two hundred eighty seven (96.3%) of them had ANC follow up for their current pregnancy. Among them more than half had four times and above ANC follow up 171(59.6%). For majority of mothers the gestational age 254(85.2%) were term, 24(8.1%) preterm and 20(6.7%) post term. Only 5(3.3%) of participants had previous still birth and 33(11.1%) of women had history of previous miscarriage.

The overall prevalence of CS in the study setting was 114(38.3%). Place of current delivery for 200(67.1%) of women was in public hospitals while for 98(32.9%) it was in private hospitals. The prevalence of CS in private hospitals was 46(46.9%) which was higher compared to 68(34.0%) in public hospitals in the study setting. 73(64.0%) of the mothers had primary Cs while 47 (36.0%) had repeat CS. CS was performed for emergency reasons in 67(58.8%), while elective CS constituted 47(41.2%) of cases [Table: 2].

Table 2: Obstetric characteristics of women who gave birth in public and private hospitals, Addis Ababa, Ethiopia 2017

Variable	Frequency	Percentage (%)
Gravid n=298		
One	122	40.9
Two-four	169	56.7
Grand multi (>5)	7	2.3
Parity n=298		
One	145	48.7
Two	133	44.6
Three	16	5.4
Four & above	4	1.3
Previous miscarriage n=298		
Yes	33	11.1
No	265	88.9
Previous fertility n=298		
Yes	7	2.3
No	291	97.7
Gestational age n=298		
<37 week	24	8.1
37-42 week	247	85.2
>42 week	27	6.7
Mode o delivery n=298		
VD	184	61.7
CS	114	38.3
Type of CS n=114		
Emergency	67	58.8
Elective	47	41.2
Current CS of delivery n=114		
Primary	73	64.0
Repeat	41	36.0
Number of previous CS n=41		
One	21	51.2
Two	14	34.1
Three	6	14.6
Fetal weight n=307		
<2500	59	19.2
2500-3999	234	76.2
=>4000	14	4.5

Table 3: Indication of cesarean section among women who gave birth by cesarean section in public and private hospitals, Addis Ababa, Ethiopia 2017

Variable	n=114	Frequency	Percentage (%)
Previous caesarean section		31	27.2
NRFHR		24	21.0
Post-term		18	15.6
Malpresentation/malposition		12	10.5
Sever preeclampsia		8	7.0
Failed induction		8	7.0
Breech delivery		7	6.1
Others		6	5.3

5.3. Associated factors of cesarean section

The level of association was computed using bivariate logistic regression analysis. For those variables that had significant association to the dependent variable, P-value of less than 0.05 was entered to multiple logistic regressions. Of all variables which are associated with cesarean section in bivariate analysis age of the mothers, educational status of the mother, gestational age and place of delivery were significantly associated with cesarean section after adjusting for other variables in the final model. Mothers whose age was between 20-29 are 47% less likely to undergone caesarean section as compared to the age greater than 29, AOR 0.47, 95%CI (0.278, 0.792).

Mothers whose educational status college diploma and above were 3.4times more likely to undergo CS as compared with the illiterate mother AOR 3.456, 95%CI (1.109, 10.764).

Mother whose gestational age was 37- 42 week are 26.5% less likely to undergo cesarean section as compared with those who gestational age is >42 week AOR 0.265, 95%CI (0.078, 0.899) [Table4].

Table 4: Factors associated with caesarean section delivery in bivariate and multivariate logistic regression among women who gave birth in public and private hospitals, Addis Ababa, Ethiopia 2017

Variable	Caesarean section		COR(95%)	AOR(95%)
	Yes n(%)	No n(%)		
Age				
15-19	2(50.0)	2(50)	0.98(0.183,5.246)	1.028(0.132,8.005)
20-29	62(31.8)	133(68.2)	0.457(0.301,0.693)*	0.47(0.278,0.792)*
>29	50(50.5)	49(49.5)	1	1
Educational status				
Illiterate	5(20.8)	19(79.2)	1	1
Primary	24(29.6)	57(70.4)	1.6(0.639,4.009)	1.749(0.552,5.540)
Secondary	43(40.2)	64(59.8)	2.553(1.050,6.205)*	2.813(0.925,8.552)
College diploma & above	42(48.8)	44(51.2)	3.627(1.475,8.919)*	3.456(1.109,10.764)*
Type of facility				
Government	68(34.0)	132(66.0)	1	1
Private	46(46.9)	52(53.0)	1.77(1.135,2.597)*	1.477(0.841,2.596)
Gestational age				
<37	8(33.3)	16(66.6)	0.211(0.64,0.688)*	0.265(0.078,0.899)*
37-42	87(35.2)	160(64.8)	0.229(0.096,0.544)*	0.219(0.090,0.535)*
>42	19(70.4)	8(29.6)	1	1

*statically associated at $p < 0.05$

6. DISCUSSION

This study gives important information regarding the caesarean section and the factors associated with it, such as demographic, socioeconomic and obstetric factor. World Health Organization reported that higher than 10% – 15% rates of CS are not justifiable anywhere. However, reports show that there is an alleged overuse of the procedure in many parts of the world [36]

In this study the overall prevalence of caesarean section in public and private hospitals in Addis Ababa was 38.3%. The prevalence of caesarean section was higher in private hospitals (46.9%) compared to public hospitals (34%) in the study setting. It was relatively comparable with studies conducted in private and government hospitals in Harar, Eastern Ethiopia (34.3%) [24]. High prevalence of caesarean section in private hospitals was consistent with studies conducted in teaching public and nongovernment/private MCH hospitals, Addis Ababa (48%), national review report of 2011 (46%) and Harer (58%) [27, 6, 24]. On the other hand the prevalence of CS in public hospital was relatively higher compared to previous studies in Jima University specialized Hospital (28.1%), Atata Hospital (27.6%) and Eastern Ethiopia Harer (26.6%) and also higher than the study conducted in a tertiary hospital in Northwestern Nigeria and at Tanzania St. Joseph Medical Hospital; the prevalence of CS was (11.3%, 18%) respectively [30,26,24,20, 21]. But this figure is higher as compared with the rate that WHO recommended which is 15% and as it is compared with the study done in different African country and our country the figure is higher. This difference might be due to higher rates of CS in urban areas are associated with the availability of technologically for/and advanced obstetric services, high rates of maternal healthcare utilization and availability of private healthcare facilities, amongst others [36].

In this study revealed that 73(64.0%) of the mothers had primary CS while 47 (36.0%) had repeat CS which was similar to study done in Attat Hospital, Gurage Zone SNNPR, Ethiopia and Bertha Gxowa Hospital, South Africa (68.7%, 65.1%) of the mothers had primary Cs while (31.3%, 34.9%) had repeat CS respectively [26]. A primary CS has far reaching implications on subsequent deliveries. Thus a decision to perform a primary CS should not be taken perfunctorily. Much has been written on measures to reduce high primary CSR, mostly in developed countries. An understanding of local context is necessary in order to design applicable strategies to reduce the primary CSR.

More than half of CS was performed for emergency reasons in 67(58.8%), while elective CS constituted 47(41.2%) of cases. This finding was similar to the study conducted in Pakistan teaching hospital which was (61.35%) emergency and (38.6%) elective [16]. However, it is lower than the study conducted in Atata Hospital, Gurage Zone SNNPR, Ethiopia (90.4%) emergency, (9.6%) elective and Felegehiwot referral hospital, Northwest Ethiopia (90.3%) emergency, (9.7%) elective [26]. This discrepancy might be the increase number of previous caesarean section and availability of private healthcare facilities in the city.

The major indication for caesarean section in the study area was previous CS (27.2%) which was followed by NRFHR (21.0%) and post term (15.8). This study was similar with the study conducted in Albania, Iran and Chiro Zonal Hospital, West Hararge [19,17,25]. However this finding was different from the study conducted in Felegehiwot referral hospital, Northwest Ethiopia, The most frequent indication was obstructed labor 30.7 % followed by fetal distress 15.9 %, abnormal presentation 13.4 % and in Attat Hospital, Gurage zone SNNPR, the leading indications for caesarean birth were, Cephalopelvic Disproportion (CPD) (38.1%), previous CS (18.9%), fetal distress (12.5%) [22, 26]. This different might be decrease trial of vaginal birth after CS and time not given for conservative management of fetal distress.

Majority of respondents 195(65.4%) found between age group of 20-29 followed by age group greeter than 29 which was 99(33.2%). In this study, maternal age is significantly associated with caesarean section in line with other different studies [8, 34]. Mothers whose age is between 20-29 are 47% less likely to undergone caesarean section as compared to the age greater than 29, AOR 0.470(0.278,0.792). This may be that older women are more likely to experience pregnancy complication such as diabetes, hypertension and preeclampsia [23].

This study showed that positive association between maternal education and caesarean section. Mothers those have education at college diploma and above are 3.4times more likely to undergo CS as compared with the illiterate mother AOR 3.456(1.109, 10.764). This finding was similar to the study done in Addis Ababa AOR3.10 (1.26, 7.64) and supported by other studies [5, 8]. Women may consider caesarean as less painful, convenient and safer option than vaginal birth. Besides, the caesarean allows women to have certainty on the development of the birth; the modern medicine also contributes to the confidence of the most educated women, which is also an important factor to consider.

Another factor observed among the studies is gestational age's is 26.5% less likely among mother whose gestational age 37- 42 week as compare with those who gestational age is >42 week AOR 0.265(0.078, 0.899).This may explain the high caesarean deliveries due to post dates pregnancy; the inductions of labour may have failed or as elective CS. Post maturity is a known risk factor for perinatal mortality and the service provided by the private sector is commonly perceived to be of better quality, mothers with complications that genuinely need CS may often prefer them.

7: STRENGTH AND LIMITATION

7.1. Strength of the study

- A high response rate of respondent
- Intensive training of data collectors and supervisors
- Most of the questionnaire adapted from previous studies review and contextualized according to the objective and pretested in the local context.

7.2. Limitation of the study

- Inability to fully investigate the effects of non obstetric factors on CS rates
- The study did not address about the views and practices of service providers related to CS delivery

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

Based on this finding it was concluded that the overall institutional (public/private hospitals) prevalence of caesarean section in Addis Ababa was 38.3%. It is high compared to the WHO recommended optimum upper limit of 15% prevalence. The prevalence of caesarean section in private hospitals was (46.9%) higher than public hospitals (34%). In the multivariate logistic regression factors identified to be significantly associated with caesarean section in this study were age, educational status and gestational age. The leading indication of CS was previous caesarean section, NRFHR and post term.

8.2 Recommendation

For Health Worker

- Trial of vaginal birth after CS should be encouraged in appropriate cases
- Time should be given for conservative management of fetal distress rather than rushing to operation theatre with a single episode of fetal heart rate abnormality.

For Addis Ababa Health Bureau

- The CS rate should be maintained within the optimum range by introducing medical audit of labor management both in private and public health facilities.

For Researcher

- Future studies need to examine the attitude of service providers and their influence on the growing CS delivery rate.

For Women

- Expectant women should be fully informed about the risks associated with medically unjustified caesarean section.

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Annex I-Information and Consent form, English version

Addis Ababa University, College of Health Science Department of Nursing and Midwifery

Consent form for the study on Assessment of Prevalence of caesarean section and Associated Factors in Addis Ababa, Ethiopia.

Good morning/after noon. My name is _____, I am working as data collector on a study. This study is about the Assessment of prevalence of caesarean section and its associated factors in selected hospitals of Addis Ababa for an investigator doing her thesis for the partial fulfillment of Master's degree in Maternity and Reproductive Health at Addis Ababa University, Ethiopia. It is my pleasure to notify you that you have been identified to participate in this study. I am doing the research on those mothers who give birth by caesarean section in the months. I am going to ask you few questions and review your chart which is very important and related to cesarean section. Your name will not be written in this form and the information you will give to us is kept confidential. If you do not want to answer all or some of the questions, you do have the right to do so. However, your willingness to answer all of the questions would important to my study and the mother be appreciated. It doesn't take more than 10 minutes.

Would you participate in study?

Yes No

If the answer is yes, thank the respondent and conduct the interview.

If the answer is no, Thank and go to the next respondent.

Data collector -----name ----- signature -----

Date of interview ----- date -----month/2009E. C.

Supervisor's name -----signature -----

Contact person principal investigators name and address

Name HiwotTsegaye

Telephone 0913466370 Email tsegayenani21@gmail.com

Annex II: Questionnaire English version

Questionnaire use to assess Prevalence of caesarean section and Associated Factors in Addis Ababa hospitals, Addis Ababa, Ethiopia, 2017.

Part I-Socio-demographic characteristics

S.No	Questions	Codes and answers
101	How old are you?	----- years I don't remember-----88
102	What is your current marital status?	1 married 2 single 3 separated 4 Divorce 5 widowed
103	What is your educational status?	1 Illiterate 2 primary (1-8) 3 Secondary (9-10) 4 Certificate/ 5 College and above
104	What is your occupation?	1 House wife 2 Government employee 3 NGO

Annex IV ለጥናቱ ከግለሰቦች መረጃ ለመሰብሰብ የተዘጋጀ መጠይቅ

ክፍል 1- የቤተሰብ ልዩ ባህሪያት

ጥያቄ ቁጥር	ጥያቄ	መልስ
101	እድሜ	-----
102	የጋብቻ ሁኔታ	1 ያገባች 2 ያላገባች 3 የተለያየች 4 የተፋታች 5 የሞተባት
103	የትምህርት ደረጃ	1 ያልተማች 2 የመጀመሪያ ደረጃ 3 ሁለተኛ ደረጃ 4 ስርተፊኬት 5 ዲፕሎማ/ቴክኒክና ሙያ 6 ከዲፕሎማ በላይ

104	የስራ ሁኔታ	1 የቤት እመቤት 2 የመንግስት ተቀጣሪ 3 መንግስታዊ ልሆነድ ርድት ተቀጣሪ 4 ነጋዴ 5 የቀንስራ 6 ሌላ ይገለጽ
105	አማካይ ወርሃዊ የቤተሰብ ገቢ	-----

Annex V Questionnaire Checklist

Part II- OBSTETRIC HISTORY

No	Question	Category	
201	Gravida	1. One 2. Two –four 3. Grand multi (> 5)	
202	Parity	1 one 2 Two 3 Three 4 four and above	If answer is 1, skip to Q 204
203	Previous still birth	1 Yes 2 No	

204	Previous miscarriage/	1 Yes 2 No	If answer is 2 skip to Q 206
205	Number of miscarriage	1 one times 2two times 3 there and more than three times	
206	Previous infertility	1 Yes 2 No	
207	ANC follow-up	1. Yes 2. No	If answer is 2, skip To Q 209
208	Number of ANC follow up	1. <4 2. 4+	
209	Gestational age in weeks	1. <37 2. 37-42 3. > 42	
210	Mode of Delivery	1 VD 2 CS	If answer is 1 skip To Q 301
211	Type of cesarean section	1. Emergency 2. Elective	
212	current CS of delivery	1. Primary	If answer is 1 skip

		2. Repeat	To Q 215
213	Number of previous cesarean section	1. One 2. Two 3. Three 4. More than three	If answer is 2,3,4 Skip to Q 215
214	VBAC	1. Yes 2. No	
215	Current indication for C/S	1. Obstructed Labor 2. NRFHR 3. CPD 4. APH 5. Previous C/S 6. Malpresentation and malposition (other than breech) 7. Severe pre-eclampsia /eclampsia 8. Failure to progress 9. Failed induction 10. Breech presentation 11. Cord prolapsed 12. Post-term (> 42 completed weeks) 13. multiple pregnancy 14. unfavourable cervix	

		with non-reassuring FHR 15 poor biophysical profile 16 maternal request 17. Other specify----- -----)	
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Part- III Outcome of Caesarean Section

307	Fetal outcome	1. Alive 2. Dead	
308	Fetal weight	1. <1000g 2. 1000- 1499g 3. 1500 – 2499g 4. 2500 - 3999g 5. > 4000g	
309	Twin delivery	1 Yes 2 No	If answer is 2 stop
310	Fetal outcome	1. Alive 2. Dead	
311	Fetal weight of twin B	1. <1000g 2. 1000- 1499g 3. 1500 – 2499g	

		4. 2500 - 3999g 5. > 4000g	
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