

**WOLKITE UNIVERSITY**

**COLLEGE OF MEDICINE AND HEALTH SCIENCE**

**DEPARTMENT OF PUBLIC HEALTH OFFICER (PHO)**



**TITLE :RATE OF CAESAREAN SECTION DELIVERY AND ASSOCIATED FACTOR AMONG WOMEN GAVE BRITH IN THE LAST ONE YEAR AT WOLKITE UNIVERSITY SPECIALIZED TEACHING HOSPITAL AND ATAT PRIMARY HOSPITAL, GUARGE ZONE, SNNP, ETHIOPIA, 2021.**

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## **ACRONY / ABBREVIATIONS**

ANC	Antenatal Care
APH	Anti-partum Hemorrhage
CPD	Cephalic Pelvic Disproportion
CS	Cesarean Section
EDHS	Ethiopia Demographic Health Survey
MMR	Maternal Mortality Rate
NMR	Neonatal Mortality Rate
NRFHR	Non-reassurance of Fetal Heart Rate
OL	Obstructed Labor
PROM	Pre rupture of Membrane
SDG	Sustainable Development Goal
SNNP	South Nation Nationality People
SPSS	Statistical Package for Social Science
USA	United State of America
VBAC	Vaginal Birth after Cesarean-section
VD	Vaginal Delivery
WHO	World Health Organization

## **Abstract**

**Back ground:** caesarean section is an operational procedure where by the fetus after the end of 28th week is delivered through an incision on the abdominal and uterine walls.

**Objective:** To assess rate of cesarean section delivery and associated factor among women who gave birth in the last one year at Wolkite university Specialized Teaching Hospital And Atat Primary Hospital, Gurage Zone, SNNP, Ethiopia, 2021

**Methods:** Institutional based retrospective cross- sectional study was conducted from Aug 25,2021 to Nov 21, 2021 at Wolkite university specialized teaching Hospital And Atat primary hospitals. The total sample size was 250. The data was collected by using structured questionnaire by systematic random sampling method from women record document that gave birth last one year at Wolkite specialized teaching Hospital and Atat primary hospital. Last. Data were entered and analyzed using SPSS version 21. Independent variables found to be significant in the bivariate logistic regression analysis at a cut-off point of p-value  $<0.25$  with were included in the multivariate logistic regression models. Adjusted odds ratios with their 95% confidence intervals and p-value  $< 0.05$  were considered to have significant association with CS. Finally, the data were described and presented using table's frequency, percentage and sentence.

**Result:** The Rate of CS in Wolkite university specialized hospital and Atat primary hospital was 23.2% with CI (15-25.8). The indication of CS in the study area was NRFHR (47.2%) which was followed by malposition and mal-presentation (30.7%) and CPD which is (22.%) and 11.9% were severe pre-eclampsia. Independent variable such as rural resident (AOR 4.095, 95%CI (1.896,8.846) and previous history of miscarriage (AOR 8.287, 95%CI (1.804, 38.063) are significantly associated with CS and age (AOR 0.511,95%CI (0.088,2.960), fetal weight (AOR 0.737, 95%CI (0.321, 1.693)were negatively associated with CS.

**Conclusion and recommendation:** The Rate of CS in study area (23.2%) was higher than the WHO recommendation 15% upper limit. In this study major CS indication was NRFHR, abnormal position and presentation and also CPD. Therefore, provide time for conservative management of fetal distress rather than rushing to operation theatre with a single episode of fetal heart rate abnormality, enhance manual correction in case of abnormal position and presentation by experienced physician and partographic follow up is needed early as possible.

**Key:** Rate, Cesarean-section

# 1. INTRODUCTION

## 1.1 Background

Caesarean section is an operational procedure where by the fetus after the end of 28th week is delivered through an incision on the abdominal and uterine walls. It does not include deliver through an abdominal incision of a fetus lying free in the abdominal cavity following uterine rupture or in secondary abdominal pregnancy (1). The first operational performed on patient is referred to as a primary cesarean section. When the operation is performed in subsequent pregnancies, it is called repeated CS. Caesarean section is normally performed when a vaginal delivery would be put the mother and baby life become at problem. So that, when adequately indicated it can prevent bad obstetrics outcomes and be a life-saving procedure for both the mother and the fetus (2). However, there is a growing concern about unnecessary CS; the increase the risk of maternal morbidity, neonatal admission to an intensive care unit (3).

The increase in CS rate was appreciated to be an American problem is becoming now international crisis. Cesarean section are rising from the 29% to 30.5% in 2004 to 2008 united states country (4).

Cesarean section was performed for many variety indications and associated factor. Because no single reason exist for obstetrics to recommend and performed the CS delivery(5).In pregnancies complicated by the fetal mal-presentation, excessive fetal growth, multiple gestation, cord prolapsed ,placenta abruption, age of the mother, educational level and different of maternal infection(6). Cesarean section delivery can be save the life of fetus and mother. Even though, many study show the higher CS delivery prevalence not crucial associated with better per natal outcomes and has even increase the fetus and mother mortality rate when we are compared with the spontaneous vaginal delivery (6).

A cesarean section delivery is performed for both maternal and fetal indications, maternal indication include: repeat CS, obstructed labor ,pelvic abnormalities, placenta abnormality, ante partum hemorrhage, sever preeclampsia and failure of augmentation and induction(7).Fetal indication include: number fetus, fetal distress mal-presentation, expected fetal weight. But, Sever congenital malformation is controversial indication for the CS delivery(8).Some experts noted no

Relation-ship between mode of delivery and infant outcomes, while other have advocate cesarean section delivery of all infants with neural tube defect(9).

World Health Organization (WHO) the cesarean section delivery recommended rate was 10% to15% according 2015. So that, the lower the prevalence suggest that unmet the recommend needed, while the higher of the prevalence rate was indicate the improper selection and when performed without medical indication (10).

A systematic review and ecological analysis were performed and concluded that at population level, CS rates higher than 10% were not associated with the reductions in maternal and newbornmortality rate (11).

The rate of CS delivery in Ethiopia regard to EDHS 2014, 2016 was 2.1%, 2% with regional variation from 0.5% to 22.9% and 0.5% to 21.8% respectively (12).

## 1.2 Statement of problem

Worldwide, approximately 830 women died every single day due to complications during pregnancy or childbirth in 2015 (13). Reducing the global maternal mortality ratio (MMR) from 216 per 100 000 live births in 2015 to less than 70 per 100 000 live births by 2030 (SDG) (14). Also, reducing the globally neonatal mortality rate(NMR)from 19 per 1000 live birth in 2015 to less than 12 per 1000 live birth by 2030 (SDG)(14). According to EHDS 2016 in Ethiopia MMR is 412 death per 100,000 live birth, there is improvement when was compare with EHDS 2011 which was 676 per 100,000 live birth (15).

Most maternal deaths are preventable as the necessary medical interventions are well known. It is therefore crucially important to increase women's access to quality care before, during and after childbirth (16). In 2016, millions of births globally were not assisted by a trained midwife, doctor or nurse, with only 78% of births were in the presence of a skilled birth attendant (17). Skilled assistance during delivery was 28% in 2016 EDHS in Ethiopia (17). In addition to this, prevalence of institutional delivery was 26% in EHDS 2016 in Ethiopia(17)

Increase in the primary CS delivery with no specified indication were faster than in the overall population and appear to be the result of changes in obstetrics practice rather than changes in the medical risk profile or increases in maternal request (19). The CS was performed without the medical indication has increase the risk of maternal and neonatal mortality when we are compare with the spontaneously vaginal delivery (20).

Cesarean section delivery is not simple as we think that save the maternal life. It is fourfold increase the maternal mortality rate, even without medical problem and obstetric complication (21). Also elective CS had a 2.84 fold greater chance maternal death as compared with to vaginal delivery. In United Kingdom two fold increased maternal mortality with CS was detected (22).

There was long term complication occurred with CS delivery. Those are recurrent CS, hysterectomy, maternal and fetal death (23). Previous CS increases the risk of the multiple placenta abnormalities like placental abruption, placental praevia and adherent placental in subsequent pregnancies (23). First birth with single CS scar 30% increases the risk of placental abruption in the subsequent pregnancies (24). In addition to this, women who have less than four spontaneously vaginal delivery with single previous CS scar has 1.7 fold increase the risk of

Placental- praevia where as women who have four or more than four spontaneously vaginal delivered with single previous CS scar delivery nine fold increased the risk of placental praevia(24).

Cesarean section delivery reduces the maternal future fertility. The natural fertility rate subsequent to pregnant 17% lower than women vaginal delivered (25). Also women delivered by CS were found more likely have an ectopic pregnancy in next pregnancies (26).

Babies are also vulnerable to unnecessary risk from rising of the CS prevalence. The first danger to the baby is 1% to 9% enhance the surgeon to accidently lacerate 6% of non vertex presentation among non vertex presentation fetus (27). Women who delivered by CS delay breast feeding initiation in the first one hour. But early breast feeding has benefit both for the mother and fetus (28). Also, reduce the skin to skin contact which is used for improve early breastfeeding initiation, maintained and duration (29).

Cesarean section delivery is approximately twice increasing the maternal mortality and morbidity rate when we are compare with spontaneously vaginal delivery (30). Studies indicated that despite clinical pressure to delay delivery until 39 weeks gestations waiting to reach this benchmark before performing a repeat CS delivery may increase the maternal risk (31).

World Health organization states that no additional health benefits are associated with CS rate above 15%. With proper selection, appropriate timing and close supervision, trial of vaginal delivery after the previous cesarean section reduces the repeat cesarean section (32). In Ethiopia the national population based CS deliveries is rate 2%. But, regional varies from one to another with range 0.5% to 21.8%(33).

With the increase in the number of cesarean sections, the cost of maternity care has also markedly increased. A previously done systematic review found that the cost of a cesarean delivery is about twice the cost of a vaginal delivery (34). Also there is an increased risk of adverse effects with cesarean section, particularly if the medical complication is does not sever (35).

Therefore, the purpose of this study is aimed to assess rate and associated CS delivery in Wolkite university specialized teaching Hospital and Atat primary hospital.

### **1.3 significance of the study**

Caesarean section can be life saving intervention for mother and baby when the vaginal birth is contraindicated. However; it is associated with increased mortality and place negatively impact on a woman future healthy. Birth by CS delivery also required extra demands on maternity services and provision of resource. Up on the completion, the finding of this study had importance for Gurage zone health office and Wolkite specialized teaching hospital and Atat Primary hospital and other organizations, to use the data for appropriate intervention. It was provide relevant information to health care providers on the magnitude and associated factors of CS which was make them to provide intensive professionally based care. And also, it can be useful for the one who was be interested to conduct further study on the topic using different study designs. Over all reproductive age mothers are benefited from the study by helping policy makers to design intervention according to the finding.

## **2 .Literature review**

### **2.1 prevalence of CS delivery**

Cesarean sections have reached epidemic proportions in many countries worldwide. It has risen in different country for instance, 46% of china, 30.5% of USA and above 25% in the Asian and European countries (36).Around the world 40% country was have prevalence of CS delivery less than 10% and 10% of country from the world have prevalence of CS delivery between the 10% and 15% which is the only country meet the recommended CS delivery by WHO in 2015.Also approximately 50% country from the world have prevalence of CS greater to 15% which is not used for the reduction maternal and neonatal mortality according to WHO 2015 report rather leading for the long term mother problem(36).

The study conducted in the Nepal prevalence of CS delivery was 8.1% in 2006 and 10.7% in 2007.This could be due to the frequent use card tomogram to monitor the fetal heart variabilityrate which none reassuring. However the as continuous electronic fetal monitoring was not available at institution of Nepal the prevalence cesarean section due to fetal distress may have been less in these series as compare those developed country (36).

Study in the north Thailand the prevalence of CS was 23.6% in 2011.The associated factor forthis study area was over diagnosis of cephalous pelvic disproportion (CPD) and subsequent repeated the CS delivery (37).

In the Africa the average of the CS prevalence was 7.3% with highest of the South Africa 15.4%and Mad scar 1.42% in 2009 and Malawi 4.53% in 2010 (38).In Egypt there was significant riseof cesarean section 10.1% in the 2000. However, hospital based cesarean delivery were much higher in 1987-8(13.9) increased to 22% in 2000.Besides; to this CS prevalence was slightly higher in private hospital the prevalence also increased consistently in public hospital (39).

Study in Namibia mission hospital the prevalence of CS delivery was 13% in 2010.The mostprominent associated factor was CPD (35.4%) followed by fetal distress(16%)(40).

In Nigeria the CS prevalence was 27.1% in 2009, The emergency CS prevalence was 83.4% andthe most associated factor were obstructed labor(OL)(45.4%),preeclampsia(18.85%) and fetal distress(11.5%).(41).

Regarding to 2016 EDHS in Ethiopia the national population based CS prevalence 2% with regional prevalence varying from the 0.5% to 21.8%.The overall institutional prevalence of CS delivery was 18% which varied between 46%in the private for profit sector and 15% in public sector. In Ethiopia for the prevalence of CS delivery 66% was maternal indication while as 34%was fetal indication (42).

The prevalence of CS delivery in Jimma University specialized hospital was 8% and the leading indication were CPD (44%), mal-presentation and apposition (21%), repeated cesarean section (16%) APH (8%) and fetal distress (6%) (43).

In Tikur Anbessa teaching hospital in cesarean delivery prevalence was 10% .In this hospital association factor that leading to CS were repeated CS(32.4%),CPD(29%),placental prevail andabruption placenta(12.6%) from all CS account 74%(44).

## **2.2 Factor associated with cesarean section**

### **2.3 Socio-demographic factor**

A systematic review was conducted in different country conclude the majority of CS delivery women between 30 and 40 years old(45).The study done in the Japanese showed that CS delivery increase as advanced maternal age greater 35 years(46).A cross-sectional study survey conducted in Addis Ababa found women older than 30 years are more likely to have CS deliverywhen compare to the younger ones between 15-24 age(47).However, the study in Ethiopia basedon EDHS 2011 CS rate did not showed the variation across the group of maternal age(48).

The study done in the different countries showed that direct proportion relationship between CS and higher education level (49).The study was made based by EDHS 2000, 2005 and 2011, the prevalence of CS delivery increases with raises the maternal education and house wealth income(50). The study which was conducted at Felegehiwot referral hospital by retrospective analysisof eligible patient records that included 2967 pregnant women undergoing cesarean section washigher among mothers in rural residence (AOR = 1.63, 95 % CI: 1.21, 2.20)(51).

## **2.4 Maternal and fetal factor**

The study which was done in Norway associated factor of CS delivery varied by maternal, gestation age, and hospital delivery. Around seven account 77.7% of operational fetal distress(21.8%), failure to progress of the labor(20.7%), previous CS(8.9%), breech presentation(8.4%), maternal choice(7.6%) and failure of the induction and augmentation(6%)(51).

The study done in the government maternity hospital India in 2014 was showed that, from 8121 eligible mother primary emergency CS contributes to 44.48% and repeat CS 26.15%. In this hospital the fetal distress the most common indication for primary CS followed by the CPD and big baby. Cephalic pelvic disproportion with pelvic abnormality and big baby were contributed to 50% for the elective CS (52).

The study conducted in Tanzania St. Joseph medical Hospital the indication overall for CS were prolonged or obstructed labor account 30% , malpresentation of the baby 20%, fetal distress 11%. The most common indication in this study was prolonged and obstructed in nulliparous and previous CS scar for multifarious(53).

Cross- section retrospective study in Atta Hospital, the leading indication of CS births was CPD 38.1%, previous CS 18.9%, malpresentation and mapposition 7.1% and APH 6%. The maternal indication was account 68% while as fetal indication was account 32%(54)

## **2.5 Obstetrics factor**

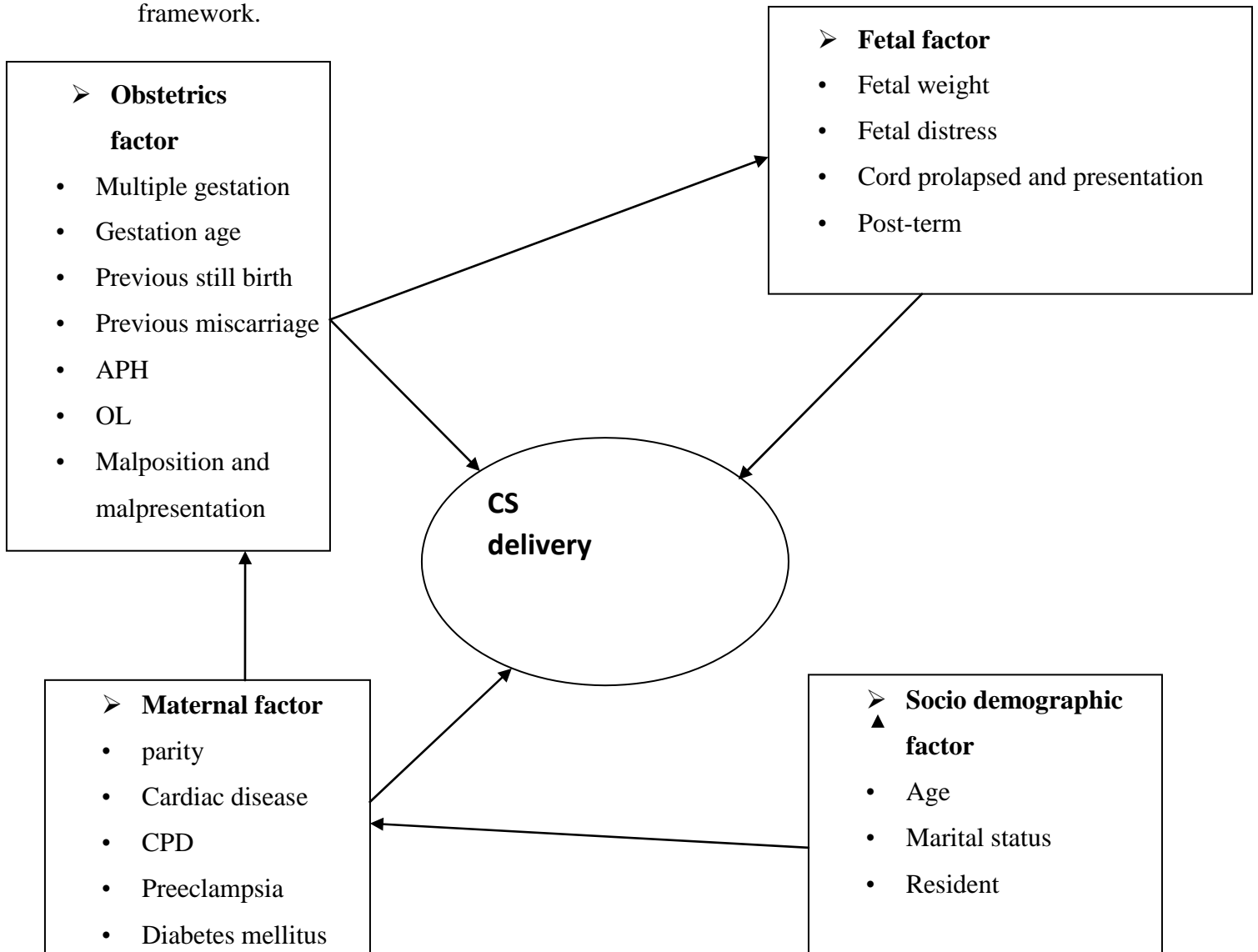
The study conducted in south west Iran indicate that women who had two or more parities and one or two alive children have more CS delivery and also women who previous miscarriages and still births was 65.49% to CS delivery (55). According to study conducted in Eastern Ethiopia in Harare, indicate that previous CS delivery, parity of three or more, fetal birth weight greater to 4000g, Natal care (ANC) follow up were have more associated to CS delivery (56).

The study done at Felegehiwot hospital showed that CS was 9.8 higher if the women had abnormal presentations. In addition to this women who having previous CS delivery and fetal weight of 4000gm were 3.93 and 13.68 times more likely give CS birth respectively(57). The

Study was made based on the EDHS data 2014 the CS delivery rate reduced as the parity was increased. But, the CS delivery was 26.5% increase with the primiparous (58).

## 2.6 Conceptual framework

Based on the above literature review CS delivery was affected by maternal and fetal factor, socio demographic factor and obstetric factor. They are summarized by the following conceptual framework.



**Figure 1** Conceptual framework on the Rate of and association factor of CS delivery which adapted from the literature review tikur anbesa generalized hospital data on 2015 CS delivery mother ,central statistical agency of on CS delivery, jimma university specialized hospital 2008 data .

### **3 .OBJECTIVE**

#### **3.1 General objective**

To assess Rate of cesarean section delivery and associated factor among women who give birth in the one last year at wolkite university specialized teaching hospital and Atat primary hospital, Gurage Zone, SNNP, Ethiopia, 2021 from Aug 25 to Nov 21.

#### **3.2 Specific objectives**

To determine Rate of cesarean section delivery at wolkite university specialized teaching hospital and Atat primary hospital, Gurage Zone, SNNP, Ethiopia.

To identify association factor with caesarean section delivery at wolkite university specialized teaching hospital and Atat primary hospital, Gurage Zone, SNNP, Ethiopia.

## **4 .METHODODOLOGY**

### **4.1 study area**

The study was conducted in wolkite university specialized teaching hospital and Atat primary hospital.

Wolkite university specialized teaching hospital which is located in Wolkite town, in the sub city of Gubryee and chiha woreda of Guarge zone, SNNP at 157km and 175 km from Addis Ababa the capital city of Ethiopia and 263km and 256km from Hawassa. Based on the 201Ec and 1986Ec, The wolkite university specialized teaching hospital is composed of 32 specialists, 40 GP, 3 dental GP, 6 public office, 3 emergency surgeon, 45 BCS nurses, 38 clinical nurse, 12 pharmacists, 7 pharmacy technician, 8 laboratory technician, 6 laboratory technologists, 2 radiologists, 17 BCS midwife, 5 anesthesiologist, 8 health information technology and 3 psychiatric nursing. and Atat primary hospital, which is located 8km far from Wolkite subcity gubryee is composed of 2 specialists, 6 GP, 2 dental GP, 8 public office, 2 emergency surgeon, 7 BCS nurse, 16 clinical nurse, 4 pharmacists, 1 pharmacy technician, 3 laboratory technician, 1 laboratory technologists, 1 radiologists, 12 BCS midwives, 3 anesthesiologist, 3 health information technology and 1 psychiatric nursing. By using those health care providers, service is given.

### **4.2 study period**

The study period was conducted from Aug 25, 2021 to Nov 21, 2021.

### **4.3 Study design**

Institution based retrospective cross-section study design was conducted/ used

### **4.4 source population**

Women who gave birth in the last one year at wolkite specialized teaching hospital and Atat primary hospital

### **4.5 study population**

Women who gave birth in last one year at wolkite specialized teaching hospital and Atat primary hospital and which fulfill inclusion criteria

### **4.6 Eligibility criteria**

### **4.7 Inclusion criteria**

Women who gave birth after fetus viability or 28 weeks gestation

## 4.8 Exclusion criteria

### 4.9 Sampling

#### 4.9.1 Sampling size determination

The sampling size determined by using the estimation of a single population proportion formula with the assumption of the 95% confidence level, Margin of error 5% and using proportion of value 18% taken from only one article of Ethiopia, Fesseh et al(60).

$$n = (Z_{\alpha/2})^2 pq / d^2$$
$$= (1.96)^2 (0.18) (0.82) / (0.05)^2$$
$$n = 233$$

Where: n=sample size of population

P=estimation population proportion

D=marginal of error which is taken to be 5%

Z=95% of the confidence interval

Then by adding 10% of the non- response rate, the total sample size would be  $233 + 23 = 250$

#### 4.9.2 Sampling technique

The total number of women who delivered in last one year at wolkite specialized teaching hospital and Atat primary hospital were 980, so we were calculate the K value.

$$K = N/n = 980/250 \quad K = 3.82 = 4$$

K=12 take the smallest sample size every 12 interval from the registration patient card until we were achieve the 250 of the estimate sample size. By using lottery method k=4 was selected so during data collection 3, 15, 27....from 3054 patient card was selected.

### **4.9.3 Sampling procedures**

The Sampling procedures Systematic random sampling were used to select the study participants from the two wolkite specialized teaching hospital and Atat primary hospital in wolkite town and chiha woreda;. The last one year clients flow to the two Hospital for cesarean section delivery service was reviewed from registration book to estimate the expected number of that was Women who gave birth visit hospital in one year period. Therefore, the average number of Women who gave birth visited the hospital in the previous one year back was 548 and 432 for wolkite specialized teaching hospital and Atat primary hospital respectively.

The calculated sample size were allocated to each Hospital based on proportion to population size of the 2 Hospital. Sample size to be allocated to each hospital were calculated by dividing the product of total sample size required and total number of Women who gave birth in expected to registration patient card of each hospital in one year period to the sum of total number of Women who gave birth expected registration patient card of the two hospital. Accordingly, proportional allocation to population size for each Hospital is 140 and 110 to wolkite specialized teaching hospital and Atat primary hospital respectively.

Sampling interval (k) was determined by dividing the total number of mothers expected of each hospital in one year period by number of sample size allocate to each hospital, thus sampling interval is approximately 4 for each hospital. Systematic random sampling were used to select the study participants and the first study subject was selectd from the first or the fourth registration patient card randomly, and then taking every fourth registration patient card.

$$\text{Wolkite Specialized}=548*250/980 =110$$

$$\text{Atat}=432*250/980=140$$

### **4.9.4 variable**

#### **4.9.5 Dependent variable**

Cesarean section

#### **4.9.6 Independent variable**

- Socio-demographic factor
- Obstetric factor
- Maternal and fetal factor
- Medical complication

#### **4.9.7 Operational definition**

**Incompletes registration document**-is the patient card which has not contain what service take,socio-demographic and out of delivery case card (61).

**Completed registration document**-is the patient card which has contain socio-demographic and delivery service taken in last one year (61).

**Caesarean section**-is the expulsion of fetus, membrane and placental by incision both abdomenand uterus (61).

#### **4.9.8 Data collection Method**

The data was collected through systematic random sampling method from registered on patient card in postnatal and gynecology ward which have obstetric factor, maternal and fetal factor, socio-demographic factor and medical complication. The information was obtained from delivery registration patient card in postnatal and gynecology ward at women gave birth Nov 1, 20 21–Nov 21, 2021. The structured questionnaire were prepared by the English version and supervised by advisor. The data collection was done by member group. During data collection, the patient registration cards which had incompleteness information were discarded.

#### **4.9.9 Data quality control**

Data quality control was entered by checking completeness of the information and cross- checking the collected data daily with the member group. The completed questionnaires were collected every day by the member and recheck for completeness for timely feedback.

##### **4.9.1.1 Data processing and analysis procedure**

The data was cleaned, coded, entered and analysis by SPSS version 21. Then, the result was presented by table frequency, percentage and sentence. Logistic regression was carried out to identify factors associated with women undergone CS. Independent variables found to be significant in the bivariate logistic regression analysis at a cut-off point of p-value <0.25 with 95% confidence interval were included in the multivariate logistic regression models. Adjusted odds ratios with their 95% confidence intervals and p-value < 0.05 were considered to have significant association with CS.

##### **4.9.1.2 Dissemination of the result**

The result of the study was presented to Wolkite University, College of medicine and health science and Department of public health officer. The soft copy and hard copy were submitted to the public health officer department. Then copy of the result was given for the Hospital, wolkite university library and interested individual.

##### **4.9.1.3 Ethical consideration**

We were get permission from wolkite University College of medicine and health science department of public health officer , and also; we were asked permission to wolkite specialized hospital and atat primary hospitals and they are allowed to conduct. The collected information from the registration patient card was keeping the privacy of the patient.

## 5 .Result

### 5.1 Socio demographic characteristics

The recorded data that get from registration cards of both of the two hospitals was 100 %( 250) involved. The age of the study participants ranged from 17-44 years. The majority of participants 164(66.2%) were between 20-30 years old with the mean age of the study participants was 29.5 years (+\_1.110SD).The majority of participants 244 (97.6%) were married. As resident status most participant 149(60.1%) was rural [table 1].

**Table 1: Socio demographic characteristics of women who gave birth in last one year atWolkite university specialized hospital and Atat primary Hospitals, Gurage Zone, Ethiopia 2021**

Variable	Frequency	Percentage
<b>Age n= 250</b>		
<b>15-19</b>	21	<b>8.4</b>
<b>20-24</b>	80	<b>32</b>
<b>25-29</b>	81	<b>32.4</b>
<b>30-34</b>	52	<b>20.8</b>
<b>35-39</b>	12	<b>4.8</b>
<b>40-44</b>	4	<b>1.6</b>
<b>Marital status n=250</b>		
<b>Married</b>	244	<b>97.6</b>
<b>Single</b>	6	<b>2.4</b>
<b>Residence n=250</b>		
<b>Rural</b>	149	<b>59.6</b>
<b>Urban</b>	<b>101</b>	<b>40.4</b>

## 5.2 Obstetric characteristics

Among the total study (250), 100(40.%) were between gravid 4 and 5 followed by 34(13.6%) of the mothers were primi-gravida and 50(20%) were more than 5 gravid and 66(26.4%) were between 2-3 gravid. About 134(53.6%) were para two and 82(32.8%) para three and above. In case of antenatal care 233(93.2%) had ANC follow up for their current pregnancy. For majority of women the gestational age 205(82.%) were term and 22(8.8%) post term. Only 13(5.2%) of participants had previous history of still birth and 31(12.4%) of women had history of previous miscarriage. Out of the 250 participant 240(96.0%) had documented partograph [Table 2].

**Table 2: Obstetrics characteristics of women who gave birth in last one year at at wolkite university specialized teaching hospital and Atat primary hospital, Gurage Zone, Ethiopia, 2021. (N=250)**

Variable	Frequency	Percentage
<b>Gravidity</b>		
<b>One</b>	34	13.4
<b>Two-Three</b>	66	26.4
<b>Four –five</b>	100	40
<b>More than five</b>	50	20
<b>Parity</b>		
<b>One</b>	34	13.6
<b>Two</b>	134	53.6
<b>Three and above</b>	82	32.8
<b>multiple gestation</b>		
<b>Yes</b>	10	4.0
<b>No</b>	240	96.0
<b>Number of fetus</b>		
<b>One</b>	240	96.0
<b>Two</b>	10	4.0
<b>Previous miscarriage</b>		
<b>Yes</b>	31	12.4
<b>No</b>	<b>219</b>	<b>87.6</b>
<b>Previous stillbirth</b>		
<b>Yes</b>	13	5.2
<b>No</b>	237	94.8
<b>Gestational age</b>		
<b>&lt;37 Week</b>	22	8.8

<b>37-42 Week</b>	205	82.0
<b>&gt;42 Week</b>	22	8.8
Antenatal care follow up		
<b>Documented</b>	233	93.2
<b>Undocumented</b>	17	6.8
Partograph		
<b>Documented</b>	240	96.0
<b>Undocumented</b>	10	4%
Mode o delivery		
<b>VD</b>	192	76.8
<b>CS</b>	58	23.2
Type of CS <b>n=58</b>		
<b>Emergency</b>	36	14.4%
<b>Elective</b>	22	8.8%
Current CS		
<b>Primary</b>	50	89.3
<b>Repeat</b>	6	10.7
Number of previous CS <b>n=56</b>		
<b>One</b>	9	81.8
<b>Two</b>	2	18.2
Fetal weight		
<b>&lt;2500</b>	58	23.3
2500-4000	191	76.7

### 5.3 Rate of cesarean section delivery

The overall rates of CS in the study setting was 58(23.2%) with confidence interval (15- 25.8). Among them 50(89.3%) of the mothers had primary CS while 6 (10.7%) had repeat CS. Cesarean-section was performed for emergency reasons in 36(62.1%), where as elective CS was 22(37.9%). From maternal indication 15(26.3%) is accounted by malposition and mal-presentation which is followed by CPD 13(22.8%) and 7(12.3%) were pre-eclampsia. Among the fetal indication NRFHR is 39(58.2%) followed by cord prolapse and presentation 18(26.9%) and also 7(10.4%) were post term pregnancy.[Table 3].

**Table 3: Indication of cesarean section among women who gave birth in last one year at wolkite university specialized teaching hospital and Atat primary hospital, Gurage Zone, Ethiopia, 2021. (N=250)**

Variable	Frequency	Percentage
<b>Maternal CS indication n=58</b>		
Failure of induction and augmentation	3	5.3
Obstructed labour	6	10.5
CPD	13	22.8
APH	6	10.5
Previous CS	4	7.0
Sever preeclampsia	8	13.8
Malposition and mal-presentation	15	26.3
Breech presentation	3	5.2
<b>Fetal indication n=67</b>	<b>Frequency</b>	<b>Percentage</b>
NRFHR	39	58.2
Cord porlapse	18	26.9
Meconium aspiration syndrome	3	4.5
Post-term	5	7.5
Large fetal weight	2	3.0

#### 5.4 Predictor of cesarean section

The level of association was computed using bivariate logistic regression analysis. Variables that fulfill the criteria of bivariate analysis were entered to multivariate logistic regression model. rural resident and no history of previous miscarriage were significantly associated with CS and also fetal weight and age also associated to negatively associated with cs after adjusting for other variables in the final model.). mothers, who are live in rural area, were 4.095 times more likely to undergone CS as compared with urban mothers AOR 4.095, 95% CI (0.1896, 8.846). Besides to this, mothers who have history of previous miscarriage 8.287 times more likely undergo CS than mother who have no history of previous miscarriage AOR 8.287, 95% CI (1.804, 38.063) and mothers whose ages are in between 20-25 groups are 51.1% were undergone CS as compared with another age group mothers, AOR 0.511, 95% CI (0.088, 2.960) Mothers those have fetal weight (2500-4000) gm 73.7 of them are more likely undergo CS where as compared with those who fetal weight are less than to 2500gm AOR 0.737, 95% CI (0.321, 1.693) [Table 4].

**Table 4: Factors associated with caesarean section delivery in bivariate and multivariate logistic regression among women who gave birth in last one year at wolkite university specialized teaching hospital and Atat primary hospital, Gurage Zone, Ethiopia, 2021. (N=250)**

Variable	Caesarean- section		COR CI 95%	AOR CI 95%
	Yes n (%)	No n (%)		
<b>Age</b>				
15-20	2(9.5)	19(90.5)	1	1
21-25	21(26.2)	59(73.8)	3.381(0.725,15.769)	2.554(0.473,13.790)
26-30	8(9.9)	73(90.1)	1.041(0.204,5.312)	0.511(0.088,2.960)
31-35	20(38.5)	32(61.5)	5.937(1.247,28.268)	3.858(0.732,20.330)
36-40	5(41.7)	7(58.3)	6.786(1.062,43.360)	3.828(0.509,28.802)
41-45	2(50)	2(50)	9.500(0.826,109.235)	8.799(0.502,154.259)
<b>Residence</b>				
Urban	12(87)	89(13)	1	1
Rural	46(30.9)	103(69.1)	3.312(1.652-6.642)	4.095(1.896-8.846)**
<b>Fetal weight</b>				
<2500	16(27.6)	42(72.4)	1	1

<b>2500-4000</b>	<b>42(22.0)</b>	<b>149(78.0)</b>	<b>0.740(0.379-1.446)</b>	<b>0.737(0.321, 1.693)</b>
<b>Previous miscarriage</b>				
<b>yes</b>	<b>2(6.5)</b>	<b>29(93.5)</b>	<b>1</b>	<b>1</b>
<b>No</b>	<b>56(25.6)</b>	<b>163(74.4)</b>	<b>4.982(1.151,21.552)</b>	<b>8.287(1.804,0.38.063)***</b>

**\*Significant at P-value=0.013, \*\*Significant at P-value=0.002,  
\*\*\*Significant at P-value=0.005**

## 6. Discussion

The Rate of CS was 23.2% with confidence interval (15-25.8). It was in line with the study conducted in the Asian and Europe, north Thailand, South Africa (25%, 23.6%, 15.4%) respectively (36, 37). However, it was higher than the study conducted in the Nepal, Tikur Anbessa hospital and Jimma University Specialized Hospital (10.7%, 10% and 8%) respectively (36, 43, 44) where as lower than study was conducted in the China, USA, Nigeria and Atat Hospital (46%, 30.5%, 27.1% and 27.6%) respectively (36, 38). Included this finding and the study conducted in different country was higher as compared with the rate that WHO recommended which is 15% (35).

The major indication for CS in the study area was NRFHR (56.7%) which was followed by malposition and malpresentation (27.7%) and CPD (22.8%) and severe pre-eclampsia which is (13.8%). This finding was higher than study which was conducted in Norway hospital, Jimma university specialized hospital and Atat hospital (21.8%, 21%, 18.9%) respectively (51, 43, 54). This different might be due to maternal hypertension that doesn't proper follow up in ANC and time not given for conservative management of fetal distress.

Mothers who have no history of previous miscarriage is significantly associated with CS which is different with study conducted in the Felegehiwot referral hospital (31). Mothers whose have history of previous miscarriage are 8.287 times more likely to undergone CS as compared with mothers have no history of previous miscarriage, AOR 8.287 (1.804, 38.063). This may be due to mothers who have history of previous miscarriage are more likely to develop pregnancy complication such as diabetes, hypertension than mother who have no history of previous miscarriage (31).

This study showed that positive association between maternal rural residence and CS. Mothers who are live in rural area 4.095 times more likely to undergone CS as compared with urban mother AOR 4.095, 95% CI (1.896, 8.846). This may be due to lack health institution, education, absences of transportation than urban living women.

Another factor observed among the studies is fetal weight which is (2500-4000) gm, are 73.7% of them were undergone CS where as compared with those who fetal weight is less than to 2500gm AOR 0.737, 95% CI (0.321, 1.693). It was different with the study conducted in the

Felegehiwot referral hospital (57). This finding may be due to fetal weight (2500-4000) gm are more likely cause obstetric complication than fetal weight less than 2500 gm.

Another factor when observed by our study that age is another associated factor for CS which is 51.1% of them were undergone CS specially age groups that found in between 20-25 years old mothers are more exposed to CS which compared to another age group AOR 0.511, 95% CI (0.088, 2.960)

Finally, this study showed that positive association between the mother who was rural residence and history of previous miscarriage to CS delivery, while fetal weight and age of the mother in between 20-25 years are showed negative association to CS delivery. In this study was NRFHR, malpresentation and malposition, CPD, and severe pre-eclampsia are more indication of CS than other indication.

## **7 .Strength and limitation of study**

### **7.1 strength of study**

### **7.2 Limitation of the study**

- Inability to obtain some socio-demographic factor
- The study did not address about the views and practices of service providers related to CSdelivery.
- The time of period to conduct of the research is time limited and some in appropriate response is taken from some staff members of atat hospital and some respondent.

## **8 .Conclusion and Recommendation**

### **8.1 Conclusion**

Based on this finding it was concluded that the rate of CS delivery in wolkite specialized teaching hospital and Atat primary hospital was 23.2% which is higher when compared to the WHO recommended optimum upper limit of 15% rate in 2015 study so by our study this number shows that highly suggestive of increasing CS delivery rate from time to time . In the multivariate logistic regression factors, rural area residence history of previous miscarriage were significantly associated with CS and fetal weight and age of the mother were negatively associated with CS delivery.

### **8.2 Recommendation**

For Health worker.

- ❖ Time should be given for conservative management of NRFHR rather than rushing to operation theatre with a single episode of fetal heart rate abnormality.
- ❖ Timely refer for mothers in health center for health care access was given area like hospitals because there is adequate and experienced health workers found in hospital.
- ❖ Educating mothers for full information about ANC and danger signs of pregnancy by early referral to better health care health station
- ❖ When the time of ANC visit accurate information should be given for mothers by the physician in order to detect before that any pregnancy complication happens .for example CPD is easily prevented by ultrasound guidance by expertise physician before to come obstetric emergency.

For chihia wereda health office

- ❖ The CS rate should be maintained within the optimum range by introducing early diagnosis complication of labor and management

For Researcher

- ❖ Future studies need to examine the role of health worker and their influence on the increasing CS delivery rate.

For Women

- ❖ The women should be fully informed about the risks associated with medically unjustified CS delivery.

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## **Annex 1**

-Information and consent form before begin the questioner

Wolkite University, College of medicine and healthy science, department of public health officer consent form for study on Assessment of Rate of caesarean section and associated factor in in Wolkite university specialized teaching hospital and Atat primary hospital, for partial fulfillment of BSC degree in Public health officer from Wolkite University

Good morning/after noon. My name is ....., I want interview with for data collect onstudy. This study is Assessment of Rate of caesarean section and associated factor in Wolkite university specialized teaching hospital and Atat primary hospital from Wolkite University. It is my pleasure notifies you that you have been selected to participate in this study. We are doing the research on those mothers who give birth by CS in these months. Iam asking you few questions related with CS .Your name will be not written in this form and the information you will be given to us is keep confidential. If you do not want to answer all or somequestions, you have the right. However, your willingness to answer all question will be have important I my study and the mother problem is solved. It does not take more then 5-8 minute.Would you participate in study?

Yes      No

If answer is yes, thank you respondent and continue interview. If answer is no, thank you respondent and go to next respondent

## Annex 2

-Questionnaire to assessment of Rate of CS and associated factor, Wolkite university specialized hospital and Atat primary hospital, Gurage Zone, SNNP Ethiopian, 2021.

### Part one-Socio-demographic factor

No	Questionnaire	Multiple choice
1	Age	
2	Marital status	1.single 2.married
3	Residence	1.urban 2.rural

### Part 2-ObestatRICTIS factor

4	Gravidity	1.one 2.two-three 3.four-five 4.more than five	
5	Parity	1.one 2.two-three 3.more than 3	
6	Previous still birth	1.yes 2.no	
7	Previous miscarriage	1.yes 2.no	
8	ANC follow up	1.documented 2.undocumented	

9	Partographic follow up	1.documented 2.undocumented	
10	Mode of delivery	1.VD 2.C/S	
11	Types of c/s	1.elective 2.emergency	
12	Current types of CS	1.primary 2.secondary	
13	Number of previous CS	1.one 2.two 3.three more than	
14	Current CS indication	1.obstructed labor 2.CPD 3.APH 4.previous CS 5.malposition and mal- presentation	
		6.sever preeclampsia 7.breech presentation 8.failure labor progress 9.DM 10,cadiac disease	

### Part 3-Fetal factor

15	Fetal weight	1.lessthan 2500gm 2.2500-4000gm	
16	Multiple gestation	1.yes  2.no	
17	Number of fetus	1.one 2.two 3.three or more	
18	Fetal weight of twin Aand B	1.lessthan 4 kg 2.4-6kg 3.6-8kg	
19	Gestational age delivered fetus	1.less than 37  2.37-42  3.greater 42	
20	Indication of fetal factor for CS	1.NRFHR 2.cord prolapse and presentation 3.meconium syndrome 4.large fetal weight 5.post term	

