



## Magnitude of Cesarean Delivery and Associated Factors Among Women Who Gave Birth at Hospitals in Gimbi Town, West Wollega, Oromia, Ethiopia.

Original Article

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### Abstract

### Article Information

**Background:** Caesarean section (C/S) is conducted after vaginal delivery is deemed unsafe due to absolute contraindications or when it poses significant risks to the health of the mother and/or fetus due to relative factors. It has proven to be a vital intervention in reducing maternal and perinatal illness and death. This study aimed to evaluate the prevalence of caesarean sections and identify the key factors influencing their occurrence in hospitals within Gimbi town. The absence of prior research in this specific area ensures the importance and timeliness of this investigation.

**Method:** A cross-sectional study design was employed at Gimbi town hospitals from September 21 to October 1, 2021, among 420 women's charts from which the data were collected retrospectively. A data extraction sheet was developed based on a previous study and the facility chart registry file. The data were entered into EpiData version 3.1. After data cleaning was done, the data were moved to SPSS version 25.0 for further analysis and interpretation. Bidata analysis was conducted to screen the associations between the dependent variable and each independent variable. A variable with a p-value of < 0.25 was taken as a candidate variable for the final model, and was brought together with the final model. Within the final model, the degrees of association were quantified using Adjusted Odds Ratios, along with their corresponding 95% confidence intervals, and a p-value of <0.05 was used to determine statistical significance.

**Results:** A total of 420 medical charts of women were reviewed during the study. The mean ( $\pm$ SD) age of the participants was  $25 \pm 4.4$ . Among total charts of mothers 57.9% of mothers were from rural areas, 81% were Oromo in Ethnicity and almost all women's 96.7% were married. In this study 52.4% of mothers were multi-gravida, 50.5% multipara, 71.7% of mothers have Antenatal Care (ANC) Follow up. Among all study respondents, only 60(14.3%) of them have previous caesarean section scar. The overall magnitude of the C/S was 33.3% with (95% CI: 28.8-37.8). In final model variable like the number of antenatal visits (AOR = 7.70, 95% CI: 1.79–33.17), the presence of risk factors (AOR = 3.39, 95% CI: 1.45–7.94), a history of adverse obstetric outcomes (AOR = 6.72, 95% CI: 2.81–16.10), and the utilization of a partograph (AOR = 6.72, 95% CI: 2.81–16.1) were significantly associated with caesarean section delivery.

**Conclusion and recommendation:** The magnitude of C/S delivery among mothers who gave birth at Gimbi town hospitals was significantly high. In opposite to the WHO standard of 10-15%. Variables like the frequency of antenatal care visits, presence of risk factors, bad obstetrics, and partograph utilisation were significant. Therefore, a caesarean section should be performed based on the principles set out in the national guideline.

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### Article History

Received: 15-06-2024

Revised: 16-11-2024

Accepted: 30-12-2024

### Keywords:

Antenatal care,  
Caesarean section,  
Maternal health,  
Partograph  
utilisation, Risk  
factors.

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## INTRODUCTION

Cesarean section is among the life-saving procedures when delivery is not feasible and plays a significant role in reducing morbidity and maternal mortality (1). It can be performed as an elective procedure when there is a definite indication or predictable risk to the mother or fetus during delivery (2). However, cesarean delivery has immediate and long-term maternal complications and temporary tachypnea newborn than vaginal delivery (3).

In contrast magnitude of cesarean delivery continues to grow from time to time for a variety of reasons, with 21.1% worldwide, 31.5% in North Africa, whereas the low C/S rate in sub-Saharan Africa, and there is growing international concern over the health consequences of the procedure without indications(4). In some cases, cesarean section is performed if necessary, where some women may not be able to access these life-saving interventions(5). However, surgery is now more common in countries with higher and lower incomes (1,6).

The globally it is estimated that around 5-15% of pregnancies end in health problems(6). However, delivery by caesarean section offers a good opportunity to prevent the negative effects of childbirth, including maternal mortality, and the result based on the quality of services given starting from pre-pregnancy(7).

According to the WHO, the country with the highest rates, at 58.1% in 2014, was the Dominican Republic (8). However, the five countries with the lowest C/S prevalence in the

world belong to African: Chad, Niger, Madagascar and Cameroon. The practice is growing in Ethiopia and varies in different parts of Ethiopia with a combined variation of 29.5%(9).

In countries where there is a low CS rate, maternal mortality and the incidence of fistula are high. Evidence reveals that factors like previous history of stillbirth, fetal weight was 2500-4000 gm, age group 20- 34 years, referral, multi-gravid, grand multi-gravid, and having no ANC follow-up were contributors to cesarean section(10). As well, it is high in rich urban areas as there is easy accessibility of private hospitals, emergency obstetric care, and women's education contributes in rising of C/S levels in urban areas (13).

The magnitude of C/S in the Buttajira General Hospital of Ethiopia was 52 (21%). Among them (13.3%) mothers had primary C/S, while (7.7%) had recurrent C/S. Surgery was performed for emergency reasons in 13.7%, and 7.3% were optional procedures (11). C/S rates are high and continue to rise in developed countries; but, the power of guidelines and recommendations in controlling their growth has been limited (12). Ethiopia has developed and utilised management to address the problem within the recommended rate (4,13). However, in an emergency, the operation required immediate intervention and the procedure was performed because of an acute obstetric emergency that resulted in endangering the health of the mother and baby (10).

In Gimbi town, the magnitude and the factors really predisposing factors to cesarean section have not been studied yet. Therefore, this study was intended to determine the

magnitude of C/S and associated factors in the study area.

## METHODS AND MATERIALS

### Study area and period

This survey was undertaken in two hospitals, located at Gimbi Town, the Capital city of West Wollega Zone. Gimbi town is found in Oromia National Regional State at a distance of 441 km from Addis Ababa capital city of the country. The total population of Gimbi town is 57517, and the town has two General hospitals and one health centre(14). The two hospitals are composed of 6 specialists, 12 General practitioners, 1 public officer, 2 Integrated emergency surgeons, 98 nurses, 30 Midwives, 19 pharmacists, 16 laboratory technicians, 5 radiographers and technicians, 5 anesthesia professionals, 4 health information technology and 1 psychiatric nurse. The hospital's maternal and child health unit monthly report indicates there are 250-300 deliveries, 350 ANC follow-ups, 200 postnatal cares, and 200 immunisations (the hospital annual report, 2021), and the study period was from September 21 to October 1/2021(Hospital human resource profile).

### Study Design

An institution-based cross-sectional study design was used.

### Populations

#### Source population

All charts of mothers who gave birth in the last year at Gimbi General and Gimbi Adventist Hospitals

#### Study population

All randomly selected medical records of women who gave birth between January 1, 2021, and December 31, 2021, over the past

year at Gimbi General Hospital and Gimbi Adventist Hospital.

### Inclusion criteria

All Charts of women who deliver after a gestational age of viability (after 28 weeks)

### Exclusive criteria:

Cesarean section for extra-uterine pregnancy and incomplete charts were excluded.

### Sample size and sampling technique

#### Sampling size determination

The sample size was estimated with the aid of the single population proportion formula, considering 49.3 % as the prevalence of Caesarean Section at Hawassa city (15), 5% margin of error. Hence, the estimated sample size is 384. After adding ten per cent of the sample size to substitute for incomplete charts, the final sample size became 422.

#### Sampling procedure /Technique.

Both Hospitals that were providing caesarean delivery in Gimbi town were purposively included in the study. The sample size was proportionally allocated to each respective hospital by considering the total number of deliveries in the past year/population proportional to size (PPS). Lastly, individual study subjects/women's chart at each Hospital was selected by a systematic random sampling technique. The sampling interval  $k=5$  was calculated by dividing the source population by the total sample size, and this interval was used in both hospitals to select study subjects. The first chart was selected by simple random sampling among the first five women's charts from the delivery registration, which is used as a sampling frame.

#### Data collection instruments and procedures

The data was collected with the aid of a data extraction sheet. that was initially adapted

from previous literature (16) (7). The checklists have sections on socio-demographics (9 questions), Obstetrics factors and medical illness-related factors (14 questions), Reasons for admission (22 questions), Indication of C/S (15 questions), and Intrapartum and postpartum maternal complications (9 questions). Two BSc Midwife nurses were assigned for data collection; one for each hospital and one supervisor was assigned during the data collection period. Orientation was given on scientific purposes, ethical aspects, and data collection procedures of the intended study.

#### **Data Quality Control**

Training on the study objective and how to fill out the chart review checklist was given. There was daily supervision and a data quality check. The data collection tools were pre-tested on 5% (22) of the sample size in Gimbi General Hospital to check the reliability of the tool.

#### **Data Processing and Analysis**

The data was entered into EpiData version 3.1 and exported to SPSS version 25 for further analysis and interpretation.

Descriptive analysis was carried out for each of the variables to check frequency, distribution, and missing values. Bivariate analysis was employed to check crude association between dependent variables and outcome variable. Variables with p value  $<0.25$  on bivariate analysis were entered to multivariable logistic regression to identify predictors of Caesarian section delivery. Odds ratio and corresponding 95% confidence intervals was used to quantify the degrees of association between independent and outcome variable at p-value  $\leq 0.05$ .

#### **Operational definition/Definition of terms**

Cesarean section is the expulsion of the fetus, membrane, and placenta by incision of both the abdomen and uterus (17).

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

An incomplete chart is a patient card that does not contain all the components filled according to the chart's needed.

#### **Ethical consideration.**

The study protocol was reviewed by the West Wollega Zonal Health Office for ethical clearance, and a support letter was provided to both hospital administrative bodies to get permission for the study. The West Wollega Zonal Health Office provided ethical approval for the use of secondary data, ensuring compliance with established terms and conditions. The approval process emphasised safeguarding confidentiality, securing informed consent for identifiable information or anonymising data, and maintaining data integrity. Researchers were required to restrict access to authorized personnel, acknowledge original data sources, and adhere strictly to approved research objectives

#### **RESULTS**

##### **Socio demographic characteristics of the study participants**

A total of 420 medical charts were reviewed at time of data extraction, with a completion rate of 99.5%. The mean age of the respondents was  $25 \pm 4.4$  years. Of the participants, 406 (96.7%) were married, 159 (37.9%) were Protestant in religion, and 340 (81.0%) were Oromo in ethnicity. Additionally, 243 (57.9%) were rural residents, and 140 (33.3%) were daily laborers in occupational status (Table1).

**Table 1: Socio-demographic characteristics of women who have gave birth at Gimbi town health facilities** Gimbi town Hospitals West Wollega, Ethiopia, 2021

Variable(n=420)	Variable categories	Frequency	Percent
Age of respondents	15-24yrs	178	42.38%
	25-34yrs	179	42.62%
	35-44yrs	63	15%
Marital status	Single	3	0.7
	Married	406	96.7
	Divorced	7	1.7
	Widowed	4	1
Religion	Orthodox	133	31.7
	Protestant	159	37.9
	Adventist	85	20.2
	Muslim	34	8.1
	Others	9	2.1
Ethnicity	Oromo	340	81
	Amhara	56	13.3
	Gurage	16	3.8
	Others	8	1.9
Family size	<4	84	20
	>=4	336	80
Residence	Urban	177	42.1
	Rural	243	57.9
Place of delivery	Gimbi General hospital	298	71
	Gimbi Adventist Hospital	122	29

### Obstetrics and medical illness-related factors

From total study participants, 220(52.4%) were multi-Gravida and about 212(50.5%) of them were multipara. Nearly half of the mothers 208(49.5%) gave birth with an interval of > 2 years. In another way 360(85.7%) of respondents have no history of previous cesarean section delivery (87.9%)

have normal fetal presentation. The reviewed charts showed that 301 (71.7%) of them have attended ANC follow-up. In which, 235(%) of them had the required ANC visits ( $\geq 4$  visits). Eighty six percent of the study participants' HIV status was Negative and 388(92.4%) of them has no history of still birth. Almost all (98.1%) of the study participants' newborns' weight was between 2500 and 3999gm (Table 2).

Table 2: Obstetrics and medical illness-related factors of women who have gave birth at Gimbi town Hospitals , West Wollega, Oromia, Ethiopia, 2021

Variable	Variable categories	Frequency	Percent
Gravidity	Prim-Gravida	187	44.5
	Multi-Gravida	220	52.4
	Grand-multi-Gravida	13	3.1
Number of deliveries	Prim-Para	196	46.7
	multi-Para	212	50.5
	Grand-multi-Para	12	2.9
Inter -pregnancy interval(n=225)	≤2yrs	17	4
	>2yrs	208	49.5
Previous Hx of C-Section	Yes	60	14.3
	No	360	85.7
Fetus presentation	Normal	369	87.9
	Abnormal	51	12.1
ANC follow	Yes	301	71.7
	No	119	28.3
Number of ANC(n=301)	<4 visit	66	21.9
	≥4 visit	235	78.1
HIV Status	Positive	2	0.5
	Negative	361	86
	Unknown	57	13.6
Birth weight in(gm)	<2500gm	8	1.9
	2500gm-3999gm	412	98.1
History of stillbirth	Yes	31	7.4
	No	388	92.4
	Unknown	1	0.2

### Reason for admission of pregnant women who gave birth

Ninety-four per cent of the study participants were admitted with signs of true labour, 326 (77.6%) and 12(2.9%) were admitted by leakage of liquor and pre-eclampsia,

respectively. Among the reasons for admission identified, 54 (12.9%) were bad obstetric history, 60 (14.3%) were previous C/S, and UTI was the most identified medical illness (Table 3).

Table 3: Reason for admission of pregnant women who gave birth at Gimbi town Hospitals, west Wollega, Oromia, Ethiopia, 2021

Variables	Variable categories	Frequency	Percent
True signs of labor	Yes	395	94

	No	25	6
Leakage of liquor	Yes	94	22.4
	No	326	77.6
Preeclampsia	Yes	12	2.9
	No	408	97.1
Eclampsia	Yes	1	0.2
	No	419	99.8
Absent fetal movement	Yes	7	1.7
	No	413	98.3
Post date	Yes	15	3.6
	No	405	96.4
vaginal bleeding	Yes	5	1.2
	No	415	98.8
Bad obstetric history	Yes	54	12.9
	No	366	87.1
Retained second twin	Yes	1	0.2
	No	419	99.8
Previous C/S	Yes	60	14.3
	No	360	85.7
Malpresentation	Yes	31	7.4
	No	389	92.6
APH	Yes	10	2.4
	No	410	97.6
Labor induction	Yes	27	6.4
	No	393	93.6
Medical illness	Yes	62	14.7
	No	358	85.3
Types of medical illness(n=62)	HTN	13	21
	DM	3	5
	HIV/AIDS	2	3
	UTI	44	71

### Magnitude of cesarean section among pregnant women

The overall magnitude of C/S in the study area was 140(33.3%) with (95%CI: 28.8-37.8). The proportion of cesarean deliveries is higher in

Table 4: - Prevalence of C/S among pregnant women who gave birth at Gimbi Town Hospitals, 2021

private than in government hospitals. Seventy-nine per cent of the performed C/S was due to emergency cases. Nearly 67% of deliveries were spontaneous vaginal delivery (Table 4).

Variables (n=420)	C/S performed	
	Yes frequency (%)	No (frequency (%)
Overall prevalence of cesarean delivery at both Hospitals	140 (33.3%)	280(66.7%)
Instrumentation applied (n=280)	44(15.7%)	226(84.3%)
Types of Cesarean delivery(n=140)	Emergency	111(79.3%)
	Elective	29(20.7%)
Oxytocin is applied for the current delivery	417(99.3%)	3(0.7%)
Utilization of Partograph	189(45%)	231(55%)

**Indication of cesarean section**

The main reason for C/S were failure to progress 62 (44%) and non-reassuring fetal status 62(44%) followed by previous scar 50

(36%) and the least indication were severe preeclampsia/Eclampsia 3 (2%), cord prolapse 3(2%), and obstructed labor 3(2) respectively (Table 5).

**Table 5:** Indication of cesarean section among women who gave birth at Gimbi Town Hospital, West Wollega, Oromia regional state, Ethiopia,2021

Variables	Response	Frequency	Percent%
CPD (Cephalo Pelvic Disproportion(n=140)	Yes	31	22
	No	109	78
Obstructed labor	Yes	3	2
	No	137	98
APH	Yes	8	6
	No	132	94
Failed induction	Yes	11	8
	No	129	92
NRFS(Non-Reassuring Fetal Status)	Yes	62	44
	No	78	56
Failed TOLAC (Trial of labour after cesarean section)	Yes	8	6
	No	132	94
Breech	Yes	25	18
	No	115	82
Cord prolapse	Yes	3	2
	No	137	98
Failure to progress	Yes	62	44
	No	78	56
Sever preeclampsia/Eclampsia	Yes	3	2
	No	137	98
PROM, prolonged	Yes	22	16



Failed instrumental delivery	No	128	91
	Yes	7	5
Previous scar	No	133	95
	Yes	50	36
	No	90	64

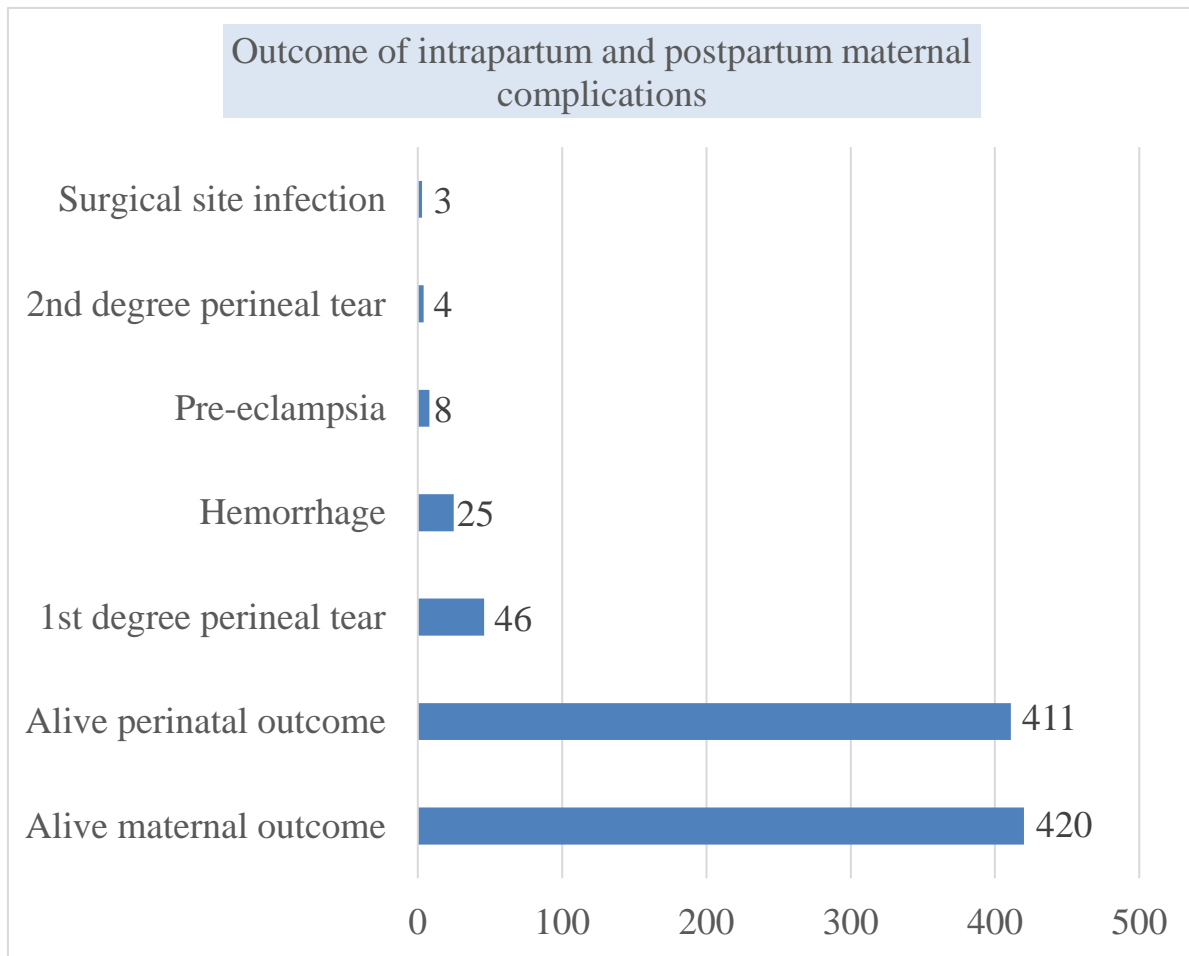


Figure 1: Outcome of intrapartum and postpartum maternal complications among women who gave Hospitals in Gimbi town, west Wollega, Oromia, Ethiopia, 2021

The study revealed that out of the study participants, approximately 46 (11%) experienced a 1st-degree perineal tear, and about 4 (1%) experienced a 2nd-degree perineal tear. Hemorrhage, pre-eclampsia and surgical site infection account for 25(6%), 8(1.9%) and 3(0.7%), respectively, among

intrapartum and postpartum maternal complications identified during the study. The study revealed that no maternal deaths and Vesico-vaginal fistula were registered on medical charts, and maternal outcomes were alive and perinatal outcomes were alive for about 411(97.9%).

**Factors associated with cesarean delivery**

In multivariable analysis, ANC visits, the presence of risk factors, poor maternal history and partograph use have been independently associated with surgical delivery. Those women who were visited under the ANC less than four times were about eight times [AOR = 7.70 (95% CI: 1.79-33.17)] have a higher chance of give birth through current surgery compared to women who have been visited more than four times. Those women who had risk factors were about three times [AOR = 3.39 (95% CI: 1.45-7.94)] more likely to have

a caesarean section compared with women who did not have risk factors during childbirth. Those women whose births were not detected using a partograph were about seven times [AOR = 6.72 (95% CI: 2.81-16.1)] more likely to have a caesarean section compared with those who were monitored with a partograph.

And women with a bad birth history were about four times [AOR = 3.74 (95% CI: 1.03-13.61)] more likely to have a caesarean section compared with those who did not (Table 6).

Table 6-Crude and adjusted odds ratios of factors associated with cesarean delivery both at hospitals in Gimbi town, West Wollega, Ethiopia, 2021.

Variables (n=420)	Categories	Cesarean Delivery		OR (95% CI)			
		Yes	No	Crude OR	P-value	Adjusted OR	P-value
Number of ANC Visit	≥4 Visits	94(40%)	141(60%)	1	<0.001	7.70(1.79-33.17)	0.006*
	< 4 Visits	9(12.9%)	61(87.1%)	4.52(2.14-9.54)			
Fetal Presentation	Abnormal	31(60.8%)	20(39.2%)	3.69(2.02-6.77)	<0.001	0.40(0.1-1.59)	0.196
	Normal	109(29.5%)	260(70.5%)	1			
Previous History of C/S	Yes	48(80%)	12(20%)	1	<0.001	0.35(0.1-1.2)	0.96
	No	92(25.6%)	268(74.4%)	11.65(5.93-22.89)			
Presence of Risk Factors	Yes	118(54.1%)	100(45.9%)	9.66(5.76-16.19)	<0.001	3.39(1.45-7.94)	0.005*
	No	22(10.9%)	180(89.1%)	1			
Bad Obstetric History	Yes	25(46.3%)	29(53.7%)	1.88(1.06-3.36)	0.044	3.74(1.03-13.61)	0.04*
	No	115(31.4%)	251(68.6%)	1			
APH	Yes	7(70%)	3(30%)	4.86(1.24-19.09)	0.032	0.06(0.01-6.94)	0.25
	No	133(32.4%)	277(67.6%)	1			
Partograph utilization	No	115(60.5%)	75(39.5%)	12.6(10.21-15.44)	<0.001	6.72(2.81-16.1)	<0.001*
	Yes	25(10.9%)	205(89.1%)	1			

		%)					
Applied instrument	No	136(36.2%)	240(63.8%)	1	0.001	2.62(0.68-10.01)	0.162
	yes	4(9/1%)	40(90.9%)	5.67(1.99-16.18)			

*I=Referent and \*Significant association*

## DISCUSSION

This study aimed to evaluate the prevalence of cesarean delivery and examine the factors associated with it among women who delivered at Gimbi Town Hospitals in West Wollega, Oromia. The results indicated a significant prevalence of cesarean delivery within the study group, with various factors affecting the likelihood of having a cesarean section.

This finding is in line with the study conducted in Jugal hospital, Harari regional state (29.7%) (18), and public hospitals in northern Ethiopia (30.95%) (19). But lower than the rate of cesarean section in public and private hospitals in Hawassa city (49.3%)(7), Dessie town hospitals 47.6% (15), comprehensive specialized hospital of Ethiopia 39.1% (9)], Addis Ababa hospitals 38.3% (12), Lagos-Nigeria 40.1%(20). The variations in cesarean delivery rates can be attributed to multiple factors, including differences in access to healthcare services, with urban areas like Hawassa, Addis Ababa, and Lagos showing higher rates due to advanced medical facilities and policies favoring repeat cesarean sections over vaginal birth after cesarean (VBAC). Technological advancements in labor monitoring and concerns about malpractice in complex deliveries also contribute to increased cesarean rates. Socio-demographic factors, such as older maternal age and economic capacity to

afford private care, further influence these rates. Empirical evidence shows that higher socioeconomic status and better healthcare access are associated with increased cesarean deliveries, while rural areas with limited resources and cultural preferences for vaginal birth exhibit lower rates.

On the other hand, the finding of the current study was higher than the results from Bangladesh, 23.94% (21), Felegehiwot referral hospital 25.4% (22), Butajira general hospital 21% (11), Suhul general hospital of Tigray region 20.2% (10), and Ado-Ekiti (Nigeria) 19.9% (20). The discrepancy might be related to the study period and improved access to cesarean delivery for eligible pregnant mothers. This implies that threshold level recommended by WHO and the international healthcare community for C/S is not implemented as, the current magnitude of Cesarean delivery was significantly high. This might be due to the fact that Gimbi General Hospital was serving as referral site for primary Hospitals, health Centers and other health facilities in the catchment area from where women with obstetrical complications are referred. In which C/S was inevitable. This is also justified with the current study as 79.3% of Cesarean section was performed for emergency reasons.

This study also revealed as the leading indications for cesarean delivery were failure of labor to progress and non-reassuring fetal

status, which is in line with study result in Jugal Hospital in which the most common indication was reported to be fetal distress and CPD(18).

According to , the study mothers having a history of ANC follow up less than four times had higher odds of undergoing cesarean delivery as compared to those mothers with the standard ANC visits. On the other hand, Women with risk factors had about three times more odds of cesarean delivery as compared to women without risk factors. The result of this study is supported evidence from Felegehiwot referral hospital, Northwest Ethiopia (22), and Addis Ababa Hospitals (7,15).

Those mothers whose labour was not monitored using a partograph had higher odds of cesarean delivery. This could be the status of maternal, fetal and progress of labour is not monitored with parameters on the pathography to decide the mode of delivery and next action. This finding is supported by the study results from Dessie town hospitals, Northeast Ethiopia, and Hawasa Hospital, Ethiopia (7).

Those women who had a bad obstetric history had higher odds of cesarean delivery as compared to those who did not. This is supported by previous studies done in other parts of the country, Hawassa city, Felegehiwot referral hospital, Northwest Ethiopia, public hospitals in northern, Jugal Hospital, Harari regional state, Suhul general hospital, Tigray, Ethiopia, where having bad obstetric history makes cesarean delivery high (7,10,18,19,22). However, in previous cesarean deliveries, fetal presentation, antepartum hemorrhage, and instrumental delivery did not show an association with the

outcome variable after confounding was controlled.

### **Limitation of the Study**

Qualitative study was not added to give chance for women and physicians to discuss more information about their decision-making on the procedure.

### **Conclusions and recommendations**

The magnitude of cesarean section in the study area was thirty-three; about fifty-five per cent of mothers followed a partograph during childbirth. In addition, a very high percentage of emergency obstetric births and the leading indications for surgical delivery were progressive failure and an unstable fetal condition, followed by a previous scar.

In addition, Multivariable analysis revealed that ANC visits, presence of risk factors, bad obstetrics history and partograph utilisation were independently associated with cesarean delivery. Therefore, a caesarean section should be performed based on the principles set out in the national guideline, expectant mothers should be followed by pathography during childbirth and information should be provided to women about the risks and benefits of surgery and mothers to have focused antenatal care.

### **List of abbreviations/Acronyms**

AARI - Average Annual Rate Increase, AH- Adventist Hospital, APH- Antepartum Hemorrhage, CEmONC-Comprehensive Emergency Obstetric and Neonatal Care, CPD – Cephalo-Pelvic Disproportion, C/S-Cesarean Section, CSR- Cesarean Section Rate, EDHS- Ethiopian Demographic Health Survey, GGH- Gimbi General Hospital, NRFHP - Non-Reassuring Fetal Rate Pattern, WHO-World Health Organisation.

### **Declarations**

**Ethical approval and consent to participate**

Ethical clearance letter was obtained from the West Wollega research, ethics review committee, and then a formal letter was written to Gimbi General Hospital and Gimbi Adventist Hospital before data collection.

**Consent to publish**

Not Applicable

**Availability of data and materials**

All the data and materials are available from the authors.

**Competing interests**

The authors declare that they have no competing interests.

**Funding**

Gimbi General Hospital and the West Wollega Zone Health Office funded this study.

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KE and GF have been involved in the conception, writing the study protocol, formulating the study design, and training of data collectors, data entry, analysis, and interpretation of data. KE, MT, LM, and ZS participated in the design, interpretation of data, reviewing intellectual content; supervised the overall process of process, and manuscript preparation, and they have provided important comments to supervise the overall process and review the manuscript.

**Acknowledgment**

We would like to thank Gimbi General Hospital and West Wollega Zonal Health Office for their material and technical support in writing this paper. We would like to extend our thanks to the data collectors for collecting data.

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