

# DETERMINANTS OF ADVERSE PREINATAL OUT COMES AMONG MOTHERS WHO GAVE BIRTH AT SELECTED GOVERNMENTAL HOSPITALS IN SOUTHWEST ETHIOPIA

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**Abstract:** Perinatal outcomes refer to life events that occur to the newborn baby from the age of viability (28 weeks) to the first week of life. The transition of fetus immersed in the amniotic fluid to life outside the womb is not always smooth and can result in adverse events to the mother or the baby. Adverse perinatal outcome is the major challenge both in low and middle-income countries. Globally, adverse birth outcomes commonly preterm birth, low birth weight, stillbirth and neonatal death are significant problems. Neonatal morbidities and mortalities are one of the most common contributing factors for 11.8 million deaths. Despite ample strategies and interventions, prevention of adverse birth outcomes has remained largely unaddressed.

**Objectives:** the main objectives of this study is to assess the determinants of adverse preinatal outcome among mothers who gave birth at selected governmental hospital in southwest Ethiopia

**Methods:** This study was done using data from three selected governmental Hospital found in southwest Ethiopia. Facility based unmatched case control study design was carried out from May 5 to June 15, 2021. The data was collected through interview by considering COVID-19 prevention protocol. Total of 310 study subject was included in the study. An individual was selected through consecutive sampling techniques. Data was entered using EpiData and analysed by using SPSS version 23. A threshold p value of less  $\leq 0.05$  was used to declare significance association between perinatal outcomes and its predictors in the chi-square test. Bivariate logistic regression was done. Variables which were significantly associated with perinatal outcomes in bivariate logistic regressions were included in the multiple logistic regressions.

**Result:** adverse perinatal outcome was 5.9 times higher in mother who had unplanned pregnancy (AOR: 5.9(2.16, 16.16), 3.48 times higher among mother who did not received iron during pregnancy (AOR: 3.48( 1.24, 9.73) and, 5 times higher risk in mother with history of chronic hypertension (AOR: 5.11(1.98, 13.17) .In contrast, the risk was (AOR: 0.33(.17, .62) and (AOR: 0.43(.22, .87) lower among mother who were urban residence and who had term birth.

**Conclusion:** Special emphasis should be given to women whose residence is rural, who have unplanned pregnancy, preterm birth and women with history of chronic hypertension and iron supplement were identified as protective factor to adverse pregnancy outcomes.

**Keywords:** Preinatal out comes, Determinates, Southwest, Ethiopia.

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**Abbreviation**

ANC	Antenatal Care	LBW	Low Birth Weight
APH	Ante Partum Haemorrhage	LMIC	Low- and Middle-Income Countries
APO	Adverse Perinatal Outcome	MACHS	Mizan Aman College Health Science
CHTN	Chronic hypertension	M TUT	Mizan Tepi-University Teaching Hospital
EMONC	Emergency Obstetric and Newborn Care	PPH	Postpartum Haemorrhage
EDHS	Ethiopia Demographic and Health Survey	PIH	Pregnancy Induced Hypertension
ENAP	Every Newborn Action Plan	PROM	Premature Rupture of Membrane
EWEC	Every Women and Every Child Health	REC	Research Ethics Committee
GTS	GH Gebre-Tsadik Shawo General Hospital	SGA	Small for Gestational Age
IUFD	Intrauterine Fetal Death	SNNPRS	South Nation Nationality People Regional State
IUGR	Intrauterine Fetal Growth Restriction	TTV	Tetanus Toxoid Vaccine

## 1. INTRODUCTION

### 1.1 Background

Perinatal outcomes refer to life events that occur to the newborn infant from the age of viability (28 weeks) to the first week of life. The transition of a fetus immersed in the amniotic fluid to life outside the womb is not always smooth and can result in adverse events to the mother or the baby. Perinatal outcomes vary from pregnancy to pregnancy which includes; normal live birth, low birth weight, prematurity in the baby, stillbirth, intrauterine fetal death, early neonatal death and late neonatal death. Adverse perinatal outcomes are those pregnancy outcomes other than normal live birth which majorly includes preterm birth, stillbirth and low birth weight which are the major cause of neonatal morbidity, mortality and long term physical and psychological problems(1-3).

Adverse perinatal outcomes are common health problems in developing countries and incur significant health consequences on infants, and emotional and economic costs on families, and communities across the world, particularly in resource-limited settings where health systems and access to and utilization of health services are weak(2-6).

The etiology of perinatal death is often unknown and depends on the quality of health care given to the pregnant women and their newborn, but can be attributable to different factors and the most common factor in developing countries were residence, educational status, occupation, hypertensive disorders of pregnancy, gestational age, place of delivery, parity, history of Perinatal death, ANC, history of abortion, mal-presentation, number of antenatal cares and an obstetric complication(7-9)

Among maternal medical problem, pregnancy induced hypertension (PIH) remains one of the top five causes of maternal and perinatal mortality worldwide. pre-eclampsia is responsible for more than 500,000 of preinatal death, this is equivalent to the loss of 1600 lives per day; more than 99% of these losses occur in low- and middle-income countries (LMIC), particularly in sub-Saharan Africa(SSA) (10, 11). Almost half of neonatal mortality can be prevented through tetanus toxoid vaccine (TTV), clean and skilled care at the birth, newborn resuscitation, exclusive breastfeeding, clean umbilical cord care, and management of infections in the newborns(8).Therefore the aim of this study is to examine determinants of adverse perinatal outcome at selected governmental hospitals in southwest Ethiopia.

## 2. METHODS AND MATERIALS

**2.1. Study setting and design.**This study was done using data from three selected governmental Hospital found in southwest Ethiopia. Facility based unmatched case control study design was carried out from May5 to June15, 2021.The data was collected through interview by considering COVID-19 prevention protocol. This study included all pregnant women who were seeking delivery services at selected hospitals during the study period. Babies delivered before 28 weeks of gestation, mothers whose age was different from15-49 years old, mothers whose charts are unavailable during data collection, mother who gave two or more babies were excluded from the study.

## 2.2. Data collection tools and procedures

Data about study variables was collected through face to face interviews using structured questionnaires and prepared checklists. Data collection was conducted by three midwives and supervision of the data collection process was managed by investigators. Midwives who were working in the delivery wards of selected facilities were recruited for data collection to manage logistics related issues. The data collection was carried out in line with COVID-19 prevention protocol. The Ethiopian demographic and health survey (EDHS) questionnaires were adapted to measure socioeconomic and demographic, obstetrics and gynaecological characteristics of the study participants. The study tool was translated to Amharic language and then translated back to the English language to check consistency. Clients' medical record was reviewed to confirm the diagnosis, previous medical and gynaecological conditions of the study participants.

## 2.3. Data analysis

The data was entered in a template prepared on Epi-Data manager version 4.4.2.1. Data cleaning was done by running frequencies and cross-tabulating with the main outcome variables. Missing values were checked against hard copies of the collected data to correct it accordingly. The data was exported to SPSS version 23 for analysis. Threshold pvalue of less  $\leq$  0.05 was used to declare significance association between perinatal outcomes and its predictors in the chi-square test. Bivariate logistic regressions were done. Hence, variables which were found to be associated with perinatal outcome were included in the multiple logistic regressions. Multi-collinearity between independent variables was checked. The Hosmer-Lemeshow goodness of fit test was used to assess the fitness of the final model.

## 2.4 Operational definitions

Adverse perinatal outcomes refer to life events that occur to the newborn from the age of viability (28 weeks) to the first 8 hours of life (LBW, preterm, stillbirth, neonatal death (10-13)

Low birth weight the weight of the newborn  $<$  2.5 kg (14, 15).

Preterm birth is a birth before a gestational age of 37 completed weeks(16).

Stillbirth: Stillbirth is a baby born with no signs of life at or after 28 weeks' gestation (8).

Neonatal death the death of baby with in 8 hours of birth

## 2.5 Ethical considerations

Ethical clearance and letter of approval was obtained from the Mizan Aman Health Science College (MAHSC), Research Ethics Committee (REC). A letter of permission was obtained from administrative bodies of the selected hospital and was given to the selected ward case team coordinators. The purpose of the study was explained and informed consent was obtained from each study participant before data collection. Confidentiality of information received from the study participants was managed by using codes rather than using the name of participants during data collection. Participants was informed that participation is fully voluntary and so that they can stop the participation at any stage of the interview if they do not want to continue

## 3. RESULT

### Participant's socio-demographic characteristics

A total of 310 respondents were included in the study with cases to control ratio of 1:2(103 cases and 207controls). Age of participant ranged from 15 to 49 years with median age of 17 and standard deviation of  $\pm 9$ . Thirty% participants were aged between 20-24 years, 94 (41.61%) of the study participants was aged 25-29 years, and 7% were aged at least 35 years. Marital status of the majority 192 (92.75%) controls and 85 (82.52%) cases were married whereas, the rest 16 (7.24%) controls & 18 (16.50%) cases were not married, either unmarried, living together, widowed or divorced. Concerning residence 130 (41.93%) of participant were rural resident of participant who were rural resident 130 (48.46%) of their birth outcome were adverse perinatal outcome while from urban residents 200 (20%) their birth outcome adverse perinatal outcome. Regarding education, 59 (58.28%) of cases and 135 (65.21) controls can read & write 44 (42.71%) and 72 (34.79%) of cases and controls respectively can not read and write whereas, 50 (24.16) controls and 38 (36.90) cases of participants husband respectively can not to read and write. Occupation, 31(30%) of cases and 69 (33.33%) controls were housewife.

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On the other hand, 7 (6.79%) and 37 (17.9%) of cases and controls respectively involve private business. Income, 31 (30%) of cases and 56 (27%) controls earns less than one thousand Ethiopian birr. In the same manner, 25 (24.27%) and 55 (26.55%) of cases and controls respectively earn four thousand Ethiopian birr or more. with regards to family size, 51 (49.5%) of cases and 88 (42.5%) controls had three or less families whereas, 52 (50.48%) and 119 (57.48%) of cases and controls respectively had four or more families. The socio-demographic characteristics of study participants are presented prissily below in the table1

**Table 1: Socio-demographic characteristics of participant, in selected governmental Hospitals of Southwest Ethiopia, 2021(n=310)**

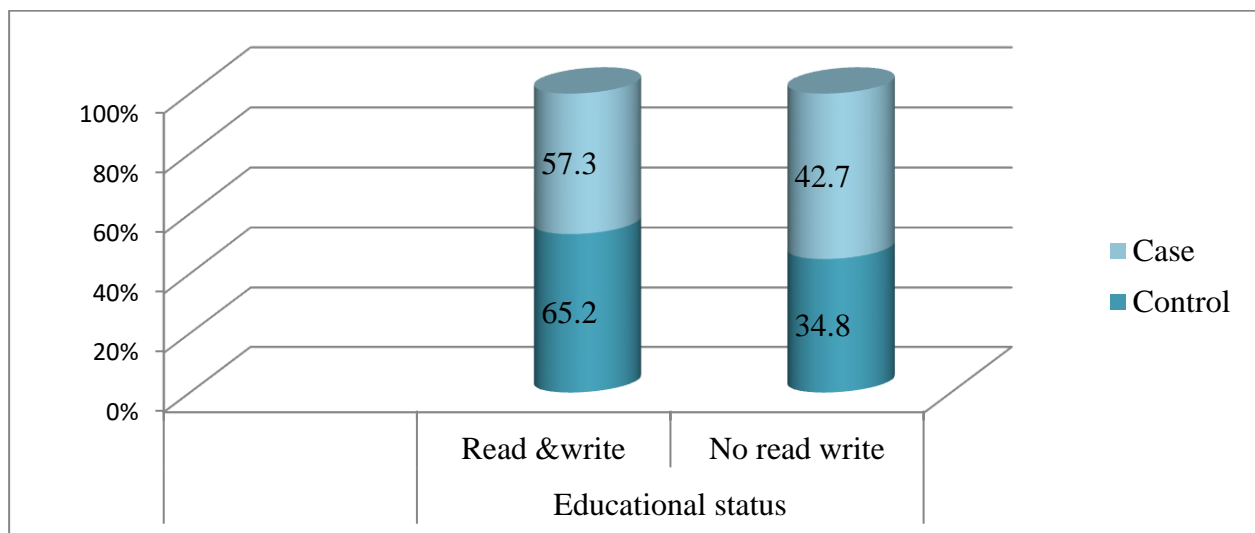
Variables	Controls (%)	Cases (%)	X <sup>2</sup>	P value
<b>Mother age(years)</b>			21	.000
15-19	10(4.83)	20(19.41)		
20-24	67(32.36)	27(26.21)		
25-29	94(45.41)	35(33.98)		
30-34	25(12.07)	10(9.70)		
≥35	11(5.37)	11(10.67)		
<b>Marital status</b>			12	0.016
Married	192(92.75)	85(82.52)		
Unmarried	2(0.96)	6(5.82)		
Living together	12(5.8)	9(8.73)		
Divorced	1(0.48)	1(0.97)		
Widowed	0(0)	2(1.94)		
<b>Residence</b>			23.4	0.000
Urban	140(68.96)	40(38.83)		
Rural	67(31.04)	63(61.17)		
<b>Education( read&amp; write)</b>			1.85	.17
Yes	135(65.21)	59(57.28)		
No	72(34.79)	44(42.71)		
<b>Source of income</b>			6.7	0.08
mother herself	5(2.41)	7(6.79)		
Husband	87(42.02)	52(58.48)		
husband & mother	110(53.14)	42(40.77)		
Other	5(2.41)	2(1.94)		
<b>Husband can read &amp; write</b>			5.5	0.019
Yes	157(75.84)	65(63.10)		
No	50(24.16)	38(36.90)		
<b>Occupation</b>			13.7	0.056
Housewife	69(33.33)	31(30.09)		
Student	21(10.14)	15(14.56)		
Daily labourer	15(7.24)	11(10.67)		
Private business	37(17.87)	7(6.79)		
Government employee	26(12.56)	20(19.41)		
Farmer	33(15.94)	19(18.44)		
Hand-craft worker	4(1.93)	0(0)		
Others	2(0.96)	0(0)		
<b>Income</b>			2.10	0.56
<1000	56(27)	31(30)		
1001-2000	42(20.28)	19(18.44)		
2001-3000	23(11.11)	17(16.50)		
3001-4000	31(14.97)	11(10.67)		
≥4001	55(26.55)	25(24.27)		
<b>Family size</b>			.136	.24
1-3	88(42.51)	51(49.51)		
≥3	119(57.48)	52(50.48)		

**Bivariable analysis of risk factors on adverse perinatal outcome**

In bivariable analysis, Mother age, Residence, source of income, Educational status of the mother, Husband ability to read & write, Planned pregnancy, Gestation of pregnancy, Number of ANC visits, Iron supplement, History of CHTN and PIH were significantly associated with perinatal outcome(Table2).

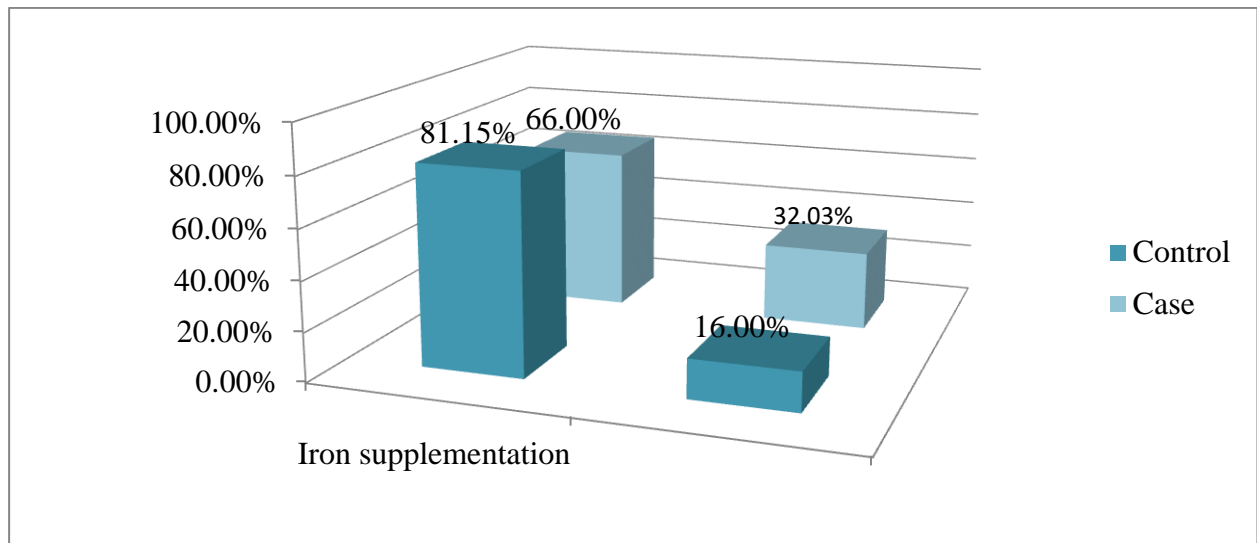
Binary logistic regression analysis revealed that mothers whose age at least 25 years were at .07 times less risk for adverse perinatal outcome than those mothers who aged 35 and above years (COR = .072, 95% CI :(.14-.93). With respect to marital status mothers who were living together were found to be at risk to develop risk of adverse perinatal outcome compared with those who had married. The odds of developing adverse perinatal outcome was found to be 2.7 times higher among mother living together compared with married mother (COR: 2.7, 95% CI: 2.71, 5.63).Those mothers who were urban resident were 0.30 times less at risk to have adverse perinatal outcome than those who were rural resident (COR =0 .30, 95% CI: (0.86, 0.49).Similarly source of income a had significantly associated with having of adverse perinatal outcome, mother who earn income herself and husband were 0.28 times less likely to have adverse perinatal outcome than mother who earn income by herself (COR= .28, 95% CI:(.0.8, .90). Husband ability to read &write were also associated with having of adverse perinatal outcome, mother whose husband can not to read &write were 18.8 times at higher risk of having adverse perinatal outcome compared with mother whose husband can read &write (COR= 18.8, 95%CI: (110.3, 06).

Bivariable analysis also shows that the odds of developing adverse perinatal outcomes was found to be 2.25times higher among women who had unplanned pregnancy compared with those who had planned pregnancy (COR: 2.25, 95% CI :( 1.05, 4.8).More over mother who had preterm birth was at higher risk to had adverse perinatal outcome, the risk of adverse perinatal outcome among mother whose birth is preterm were2.22 times higher risk to have adverse perinatal outcome compared to that term birth (COR 2.22, 95% CI (1.377, 3.59.) .Antenatal care ,mothers who had less than two ANC were at higher risk to haveadverse perinatal outcome, mothers who had less than two ANC were3times more likely to have adverse perinatal outcome than mother who have three and more ANC (COR: 3, 95% CI :( 1.64-5.65) Likewise , women who did not receiving iron during pregnancy was found to be a statistically significant risk factor for having adverse perinatal outcome ,mother who did not received iron during pregnancy were 2.47 times at risk of having adverse perinatal outcome than mother who received iron (COR: 2.47, 95%CI: (1.47, 4.32).And those mother who had history of chronic hypertension were 2.53times more at risk to have adverse perinatal outcome than those who had no family history of chronic hypertension (COR: 2.53, 95% CI :( 1.25, 5.10).



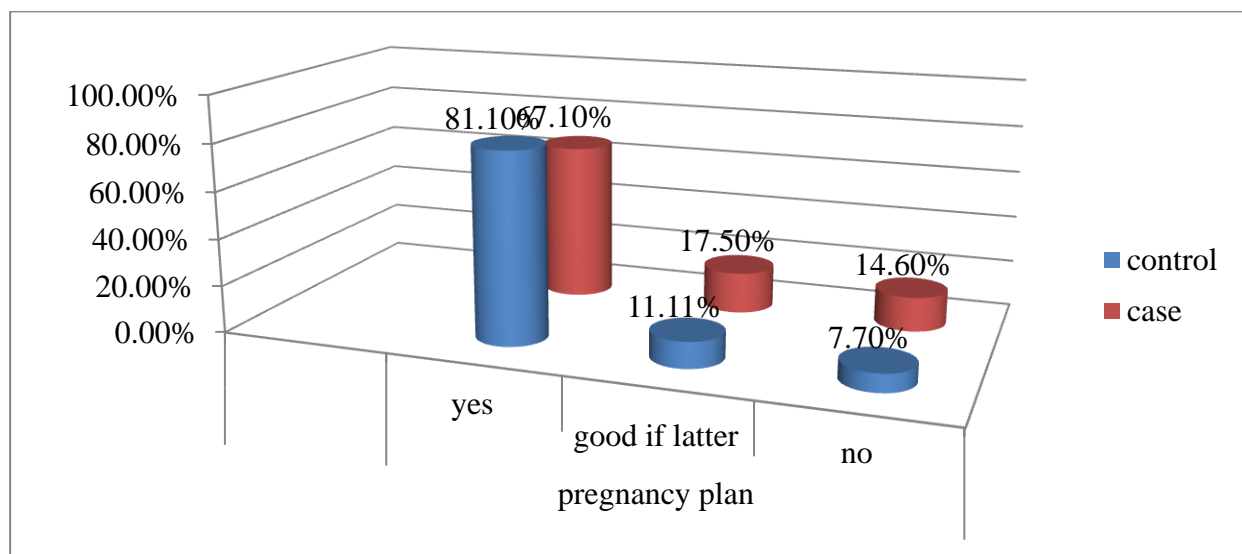
**Figure 1: educational status women who gave birth, in selected governmental Hospitals of Southwest Ethiopia, 2021**

Educational status, 57.3% of cases and 65.2% of controls were reported as they have the ability to read and write



**Figure 2: women who supplemented iron during pregnancy in selected governmental Hospitals of Southwest Ethiopia, 2021**

Iron supplementation was found to be low among cases compared with controls. Of the total respondents who had iron supplemented, 236(28.8%) & 66(50%) women were iron supplemented among controls and cases respective



**Figure 3: women intention of pregnancy in selected governmental Hospitals of Southwest Ethiopia, 2021**

Planned pregnancy was found to be high among controls compared with cases. From the total respondents who had unplanned pregnancy, 15(48.4%) had adverse perinatal outcome

**Table 2: Bivariable analysis of risk factors on determinants of adverse perinatal outcome among women who gave birth, in selected governmental Hospitals of Southwest Ethiopia, 2021(n=310)**

Variables	Controls (%)	Cases (%)	COR (95%CI)	P value
Mother age(years)				
15-19	10(4.83)	20(19.41)	2(.64,6.18)	.036
20-24	67(32.36)	27(26.21)	.40(.156,1.04)	
25-29	94(45.41)	35(33.98)	.072(.14,.93)	
30-34	25(12.07)	10(9.70)	.4(.132,1.21)	
≥35	11(5.37)	11(10.67)	1	

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Marital status				
Married	192(92.75)	85(82.52)	1	
Unmarried	15(7.25)	18(17.48)	2.71(1.30,5.63)	.008
Residence				
Urban	140(68.96)	40(38.83)	1	.000
Rural	67(31.04)	63(61.17)	3.29(2.013,5.381)	
Education( read& write)				
Yes	135(65.21)	59(57.28)	1	
No	72(34.79)	44(42.71)	1.3(.86,2.26)	.017
Source of income				
mother herself	5(2.41)	7(6.79)	1	
Husband	87(42.02)	52(58.48)	.42(.12,1.41)	
husband & mother	110(53.14)	42(40.77)	.27(.08,.90)	.034
Other	5(2.41)	2(1.94)	.28(0.3,2.1)	
Husband can read &write				
Yes	157(75.84)	65(63.10)	1	
No	50(24.16)	38(36.90)	18.83(1.10,3.06)	.020
Planned pregnancy				
Yes by then	168(81.15)	70(67.96)	1	
good if latter	23(11.11)	18(17.47)	1.87(.95,3.69)	
No	16(7.72)	15(14.56)	2.25(1.05,4.80)	.036
Gestation of pregnancy				
<37weeks	76(36.71)	58(56.31)	0.45(.27,.72)	.001
≥38 weeks	131(63.29)	45(43.69)	1	
No of ANC visits				
1-2	(2513.66)	28(32.55)	3(1.64,5.65)	.000
≥3	158(.33)	58(67.44)	1	
Iron supplement				
Yes	168(81.15)	68(66.01)	1	
No	33(15.94)	33(32.03)	2.47(1.41,4.32)	.001
History of CHTN				
No	90(91.78)	84(81.55)	1	
Yes	17(8.21)	19(18.44)	2.53(1.25,5.10)	.010
PIH				
No	200(96.62)	90(87.33)	1	
Yes	7(3.38)	13(12.62)	4.12(1.59,10.69)	.004

ANC: antenatal care, GA: gestational age, CHTN: chronic hypertension, PIH, pregnancy induced hypertension,

Multivariable logistic regression analysis of risk factors on determinants of adverse perinatal outcome: Table (3) showed about analysis which was done on medical, obstetric and socio-demographic factors within cases and controls. The variation among cases and controls were analyzed in binary logistic regression, after that a variable which was statistically significant within binary logistic regression were entered into multivariable logistic regression analysis to establish the determinants of adverse perinatal outcome. In multiple logistic regression analysis residence, pregnancy plan, iron supplement, gestation of pregnancy and history of CHTN were significantly associated with adverse perinatal outcome as clearly depicted in (Table3)

Living in rural areas was statistically significant risk factor for adverse perinatal outcomes. The multivariable analysis showed that mothers who were urban residents were 0.33 times at less risk to have adverse perinatal outcomes than mothers who were rural residents (AOR: 0.33, 95%,CI: .17, .62). Plan of pregnancy was also found to be independently associated with adverse perinatal outcomes in multiple logistic regressions. The odds of having adverse perinatal outcome were found to be higher in mothers who had unplanned pregnancy than mother who had planned pregnancy (AOR: 5.9, 95%,CI: (2.16, 16.16). Likewise, multiple logistic regressions showed that the risk of having adverse perinatal outcomes was impacted by iron supplementation during pregnancy. Mothers who did not have iron supplements were 3.48 times at higher risk to have adverse perinatal outcomes compared to mothers who had iron supplements (AOR:3.48,95%CI:

(1.24, 9. 73). Mothers who had history of HTN were 5 times at higher risk of having adverse perinatal outcome compared to with mothers who had no history of HTN (AOR: 5.11 95%, CI: 1.98, 13.17). Preterm birth increased risk of having of adverse perinatal outcome. Mothers who had term birth were 57% less likely to have of adverse perinatal outcome than mothers who had preterm birth (AOR: 0.4395%, CI: .22, .87).

**Table 3: Multivariable logistic regression analysis risk factors on determinants of perinatal outcome among women who gave birth, in selected governmental Hospitals of Southwest Ethiopia, 2021(n=310).**

Variables	Cases (%n)	Control(%n)	COR (95%CI)	AOR(95%CI)	P value
<b>Residence</b>					
Urban	192(92.75)	85(82.52)	1	1	
Rural	15(7.25)	18(17.48)	0.30(0.18,0.49)	0.33(.17,.62)	.001
<b>Pregnancy plan</b>					
Yes by then	168(81.15)	70(67.96)	1	1	.002
Good if latter	23(11.11)	18(17.47)	1.87(.95-3.69)	5.90(2.16,1)	
No	16(7.72)	15(14.56)	2.25(1.05,4.80)	4.58(.8,25)	
<b>Iron supplement</b>					
Yes	168(81.15)	68(66)	1	1	
No	33(15.94)	33(32.03)	2.47(1.41-4.32)	3.48(1.24,9.73)	.017
<b>CHTN</b>					
Yes	90(91.78)	84(81.55)	2.53(1.25-5.10)	5.11(1.98,13.17)	.001
No	17(8.21)	19(18.44)	1	1	
<b>Gestation of pregnancy</b>					
<37weeks	76(36.71)	58(56.31)	0.45(.27,.72)	0.43(.22,.87)	.019
≥38 weeks	131(63.29)	45(43.69)	1	1	

CHTN: chronic hypertension, \*\*Percentage is calculated from column total

#### 4. DISCUSSION

This study indicates that the determinants of adverse perinatal outcome among women who gave birth in selected governmental Hospitals of Southwest Ethiopia. To the best of our knowledge there is no study on determinants of adverse perinatal outcome in southwest Ethiopia. Rural residence were at increased risk of adverse perinatal outcome, the other core finding were place of pregnancy, which was significant associated with reduced risk of adverse perinatal outcome during the study period, we also appreciate that there is significant reduced risk of having adverse perinatal outcome among women who gave birth at term and women who received iron during pregnancy in multivariable analysis.

In multivariable analysis place of residence was found to be a risk factor for having adverse perinatal outcome. Mother who live in urban were 33 times less likely to have adverse perinatal outcome than mother who live in rural. This finding is in agreement with study done in Gamogofa however, lower than study done in sub-Saharan Africa and the discrepancy may be due to socio cultural difference (17, 18). Likewise, Mothers who had plans for pregnancy were found to be at lower risk to have adverse perinatal outcomes compared to those mothers who had unplanned pregnancy. The odds of adverse perinatal outcome were 4.58 times higher for mothers who had unplanned pregnancy. This odd of adverse perinatal outcome was higher than study done in Tigry (19). Iron during pregnancy was found to be a statistically significant risk factor for having adverse perinatal outcome in this research. The odds of having adverse perinatal outcome were found to be 3.48 times higher among mothers who did not iron supplements than mothers who received iron during pregnancy, this finding is supported by studies done before (20, 21). Having adverse perinatal outcome was also impacted by the history of HTN. Mother who had history of HTN was 5 times at risk to have adverse perinatal outcomes than mother who hadn't history of HTN, this finding result is higher than study done in AA and other study done in sub-Saharan Africa (17, 22). The disagreement might be due to study setting and, health care utilization behaviour of the mothers for observed higher adverse perinatal outcome. We also in this study found that gestation of pregnancy was the other risk factor for having of adverse perinatal outcome, and mothers who had term birth were 57% less likely risk of adverse perinatal outcome compared to mothers who had preterm birth the finding is in line with research conducted in Axum despite, is lower than research done in India and in contrast with research done in Vietnam (23-25)



## 5. STRENGTH AND LIMITATION OF THE STUDY

### 5.1. Strength of the Study

Involving study subjects, cases and controls within the same hospital. Unavailable data on records that may have impact on the dependent variable was obtained by interview it could avoid missing data. Examining the effect of multiple risk factors of adverse perinatal outcome

### 5.2 Limitation of the study

The data may possibly expose to recall bias and participants may not share the original characteristics therefore social desirability bias is unavoidable. Diagnostic experiences variation of physician

## 6. CONCLUSION AND RECOMMENDATION

### 6.1. Conclusion

In conclusion, this study identify that low birth weight was the highest among adverse pregnancy outcomes and on the other hand, stillbirth was the second most adverse birth outcome followed by preterm birth from births takes place in selected hospitals of southwest Ethiopia in 2021. This study also indicates that there are different risk factors for adverse perinatal outcome. Rural residence, unplanned pregnancy, preterm birth, history of HTN were identified risk and iron supplements was identified as protective factor to adverse pregnancy outcomes

### 6.2 Recommendation

This research indicates factors associated with adverse perinatal outcome may be used to prevent adverse perinatal outcome.

The following recommendations are suggested based on the finding of our study which provides a chance for prevention of adverse perinatal outcome. Pregnant women particularly living in rural should have access for maternal health service and contraception and iron shall be strengthens

### Declaration

### Ethical approval

Ethical approval was obtained from the Mizan Aman Health Science College, Research Ethics Committee. And, (Project. 0062021/approved 07 May 2021). Consent was. Obtained from each study participant before data collection . Consent for publication was done Data and materials are available with Corresponding author

### Competing interests

The authors declare that we have no competing interests.

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Mizan-Aman Health Science College

Authors' contributions

ISRAEL DEREKIYAB · MELESE TEBEKA ,TEREFE KETO · conceived the study and contributed to the design, analysis and interpretation of the study .All authors read and approved the final version of the manuscript

Principal investigator /corresponding author MELESE TEBEKA

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