

# Assessment of Knowledge and Practice Towards Prevention of Anemia Among Pregnant Women Attending Antenatal Care at Government Hospitals in West Shoa Zone, Ethiopia

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## Abstract

**Back ground:** Anemia affects 1.62 billion people (24.8%), among which 56 million are pregnant women. It is a major public health problem particularly among poorer segments of the population in developing countries where 95% of the world anemic pregnant women are residing. Anemia is one of the most commonly encountered medical disorders during pregnancy. According to WHO estimates, up to 56% of all women living in developing countries are anemic. **Objective:** The objective of the study was to assess the knowledge and practice regarding Prevention of anemia among pregnant mothers attending ANC in Governmental hospitals at west shoa zone, Ethiopia. **Method:** Hospital based cross sectional study was employed in three public hospitals found in West Shewa Zone to find out the level of knowledge and practice regarding prevention of anemia during pregnancy among women attending ANC. A total of 286 pregnant mothers were interviewed by using pretested structured questionnaire from three hospitals. Simple random sampling procedure was carried out to attain the required sample size. Data was entered and processed in to the computer using SPSS version 20. **Results:** A total of 286 pregnant women were participated on the study. Among them only 57.3% and 50% were found to have good knowledge and poor practice respectively regarding prevention of anemia during pregnancy. Crude and adjusted odds ratio done revealed that educational status, living in urban, having nuclear family type, previous history of anemia and good practice were significantly associated with knowledge, while educational status and having good knowledge also found to be significantly associated with prevention of anemia during pregnancy. **Conclusions:** Based on study findings, half of the study participants attending ANC at West Shoa Zone Governmental Hospitals have Poor Knowledge and poor skills regarding prevention of anemia during pregnancy. Multiple factors such as education, residency, having nuclear type of family and previous anemia history found to affect knowledge and practice regarding prevention of anemia during pregnancy significantly. Therefore, Policy makers would be better consider those factors contributed in prevention of anemia during pregnancy.

**Keywords:** Knowledge, Practice, Prevention, Anemia, Pregnant Women, Antenatal Care.

## INTRODUCTION

The women are in different stages of their lives and one such stage is pregnancy which is a special event in women's life and joyful anticipation. But sometimes it can be a time of fear of Suffering and death in case women begins pregnancy with low or absent stores of iron due to heavy menstrual period, a previous pregnancy, poor iron intake, substance abuse and increase fetal demands of iron leads to anemia<sup>(1)</sup>.

Iron is an essential component of hemoglobin, the oxygen-carrying pigment in the blood. Iron is normally obtained through the food and by recycling iron from old red blood cells and in the absence of the required iron blood concentrations, blood cannot carry oxygen effectively and hence normal functioning of every cell in the body will be affected. It is estimated that a median amount of 840-1210 mg of iron needs to be absorbed over the course of the pregnancy<sup>(2)</sup> Approximately 90% of cases of anemia in pregnancy are of the iron deficiency type<sup>(3)</sup>.

Globally, anemia affects 1.62 billion people (24.8%), among which 56 million (41.8%) are pregnant women. It is a major public health problem particularly among poorer segments of the population in developing countries where 95% of the world anemic pregnant women are residing<sup>(4)</sup>.

In Africa, 57.1% of the pregnant women were anemic<sup>(5)</sup>. Seventeen percent of Ethiopian women in the reproductive age group are anemic and 22% of these women are currently pregnant<sup>(6)</sup>. In Ethiopia, it has also been estimated that 62.7% of pregnant women were suffering from anemia and it is a severe public health problem<sup>(5)</sup>. Geographically, those living in Asia and Africa are at the greatest risk<sup>(8)</sup>.

Women with anemia in pregnancy may experience fatigue, reduced energy levels, and reduced mental performances and in cases of severe anaemia it is associated with preterm birth, low birth weights and a small for gestational age fetus<sup>(9 10)</sup>. Anemia is a silent epidemic which is a critical health concern. The treatment and preventive measures are cheap and easy to follow by the pregnant women.<sup>(11)</sup>

A study on “Knowledge attitude and practice of pregnant women in correlation with Anemia” was conducted in India. It revealed that the lower the knowledge about Anemia in pregnant women increase the ‘risk five times’ and the worst practice about prevention of Anemia in pregnant women increased anemia ‘risk six time’. So the potential risk factors that indicated to increase Anemia were, Knowledge and Practice about Anemia in pregnant mothers<sup>(12)</sup>

Most maternal deaths are preventable, as the health-care solutions to prevent or manage complications are well known. All women need access to antenatal care in pregnancy, skilled care during childbirth, and care and support in the weeks after childbirth. Success is highly dependent on the patient’s ability to fully adhere to the prescribed treatment regimen<sup>(13)</sup>.

Poverty, ignorance, lack of knowledge regarding nutritive value of foods and inadequate sanitary environment are the major factor responsible for low intake of iron rich food. In developing countries located in tropical climates, the most common cause of iron deficiency anemia is infestation with hookworm.<sup>(14)</sup>

Anemia can be prevented and controlled in pregnant women by improvement in knowledge and practice in diet and prophylactic treatment by iron folic acid, improvement of diet and treatment for worm infestation and malaria.<sup>(11)</sup>

According to EDHS 2011 report, among women with a live birth in the five years preceding the survey, only 34 percent took iron tablets during their last pregnancy.<sup>(6)</sup> Although reports exist about what is being done and what should be done globally and locally to address maternal anemia prevention and treatment, maternal mortality and anemia prevalence around the world including Ethiopia continues to remain high. Therefore it is helpful for all stake holders that involves in this area i.e patient care givers, health care providers, health institution and policy maker.

## **Method and Materials**

### **Study Area and Period**

West Shoa Zone encompasses three functional governmental hospitals which will also serve surrounding woredas of other zones. These are Ambo General Hospital, Gindeberet Hospital and Gedo hospital. Ambo hospital is one of the oldest hospitals found in Oromia regional state. It is placed at the center of Ambo town which is the capital of the zone and around 110 km far from the center of the country Addis Ababa to the west. Ambo General Hospital has been giving different health services for community from the whole west Shewa zone and eastern parts of Horo Guduru welega zone. The second is Gindeberet hospital, which found around northern part of the zone which is around 185km from Addis. The third selected study area is Gedo hospital which is among the recently organized hospitals and is found in cheliya wereda of west Shewa zone specifically in Gedo Town. Gedo town is around 185 km away from Addis Ababa to the west and 70km from the capital of the zone, Ambo is on the main road to Nekemte. This study was conducted from June to September, 2015 in three public hospitals found in West Shewa Zone of Oromia Region.

### **Study design**

Institutional based cross-sectional study design with quantitative data collection method was employed. Inclusion criteria were all pregnant women who are attending antenatal care in the selected hospitals during the study period.

### **Sample Size and Sampling Technique**

Sample size was determined by using single population proportion formula. The prevalence anemia is 22% among pregnant mothers according to EDHS of 2011 in Ethiopia

$$n = \frac{(z\alpha/2)^2 * p(1-p)}{d^2} = \frac{(1.96)^2 * 0.22(1-0.22)}{(0.05)^2} = 264$$

By considering 10% non-response rate, the final sample size will be **290**.

### **Sampling technique**

A simple random sampling technique was used. The sample was selected from three hospitals which are Gedo hospital, Gindeberet hospital and Ambo hospital. The number of study respondents were allocated proportionally for three hospitals, based on their total number of pregnant women attending Antenatal care.

### **Data Collection and Measurement**

Data collection instrument was developed and adopted from different literatures that have been used by different studies done both in Ethiopia and out of Ethiopia. The tool was edited and translated from English to Afan Oromo. The interviewer administered questioners was used to collect the data.

### **Data Collection Methods**

Self-administered structured questioner and interview was used. Nine data collectors with three supervisors in each hospital were assigned to collect the data after one-day extensive training concerning the data collection tools and procedures is provided. Before the actual date of data collection, the registration book of the hospitals was observed, and the ID of those clients who fulfilled the inclusion criteria and who have been attending the Antenatal care was selected, copied and arranged for the data collectors.

### **Operational Definition:**

According to this study respondents with all correct response get above the mean value, higher points indicate good knowledge and score less than the mean value indicated Poor knowledge.

Based on total score, knowledge level on prevention of Anemia by among pregnant mothers were categorized into good and poor knowledge based mean value.

Practice of prevention of Anemia by pregnant mother means that the pregnant mothers took Iron prophylaxis or eaten any nutritious, which rich in iron during current as prevention of anemia.

Anemia: - is the hemoglobin concentration of less than 11 gm/dl and a hematocrit of less than 33%.

### **Quality Assurance**

The questionnaires for the data collection was pretested on ten percent of the sample size one month before the date of actual data collection at Ambo health center. The tool was edited and modified after pretest, according to the objectives of the study. After obtaining of ethical clearance, the principal investigators prepared training guide for both supervisors and interviewers. Then supervisors and data collectors were properly trained. During the data collection, the quality of the data was controlled by strict supervision of the data collectors, the collection procedure and daily reviewing the collected data. Any missed items from the questionnaire and misunderstandings of items by the data collectors was immediately reviewed by the supervisors and correct for the next day of data collection with the principal investigators.

### **Data processing and analysis**

After data collection, each questionnaire was checked for completeness, edited, cleaned missed values and missed variables and data were analyzed by using SPSS software version 23.0 to provide frequencies and percentages for categorical variables and means and standard deviations for numerical variables and multivariate logistic regression (stepwise backward likelihood ratio method) was conducted to analyze factors that were associated with Knowledge and Practice towards prevention of anemia. P-value of less than 0.05 will be considered to add the variables in the equations in the process of stepwise model at 95% C.I (P-value < 0.05). The data will be summarized and the adjusted odds ratios (AORs) estimated; and their corresponding 95% confidence intervals (95% CI) are computed. The result was presented using tables, figures and narratives.

### **Ethical Issues**

Ethical approval was obtained from college of Medicine and Health Sciences research committee. After approval, official letter of support was written to the hospitals identified before the actual data collection date. Furthermore, before collection of any information from study participants, a verbal consent was obtained from each respondents and they were asked for willingness in participation of the study. The participants' right to refuse or interrupt the interview was secured.

## **RESULT**

### **Socio-demographic Characteristics**

The socio-demographic characteristics of the study participants were displayed on frequency table 1 below. With the response rate of 98.6, the mean age of the respondents was 25.38 ( $\pm$  SD=5.169) years. Among participant women, most of them 261 (91.3%) were from Oromo ethnic group and majority 159(55.6) were followers of protestant religion. Concerning the educational status of the participants, majority 201(71.3%) of them attended formal education.

However, nearly half 140(49%) of the participants were unemployed. Therefore, 47.6% of the participants' monthly income was less than 100 birr.

Table 1: Distribution of Socio-demographic Characteristics of the Respondents in the three public hospitals in West Shoa Ethiopia, 2017.

S. No.	Characteristics	Number	Percent
1.	<b>Age Group( 286)</b>		
	<18	24	8.4
	18- 20	32	11.2
	>21	230	80.4
2.	<b>Ethnicity (n=286):</b>		
	Oromo	261	91.3
	Amhara	16	5.5
	Gurage	5	1.7
	Tigre and Others	4	1.4
3.	<b>Religion (n=286):</b>		
	Protestant	159	55.6
	Orthodox	114	39.9
	Muslim	9	3.1
	Others	4	1.4
4	<b>Educational Status (n=286):</b>		
	Illiterate	60	21.0
	Read and write	25	8.7
	Primary school (Grade 1-8 <sup>th</sup> )	76	26.6
	9-10 <sup>th</sup>	50	17.5
	11 <sup>th</sup> and above	75	26.2
5	<b>Marital Status (n=286):</b>		
	Married	271	94.8
	Unmarried	14	4.9
	Widowed	1	0.3
6.	<b>Type of Family (n=286):</b>		
	Nuclear	195	68.2
	Joint Family	90	31.5
7.	<b>Occupation (n=286):</b>		
	Unemployed	140	49
	Government employee	62	21.7
	Merchant	22	7.7
	Agriculture	17	5.9
	Student	15	5.3
	Daily laborer	14	4.9
	Private employee	14	4.9
	Others	2	0.6
8.	<b>Monthly Income (n=286):</b>		
	<100	136	47.6
	>101	150	52.4
9.	<b>Residence (n=286):</b>		
	Urban	188	65.7
	Rural	98	34.3

#### Obstetric Profile of the Respondents

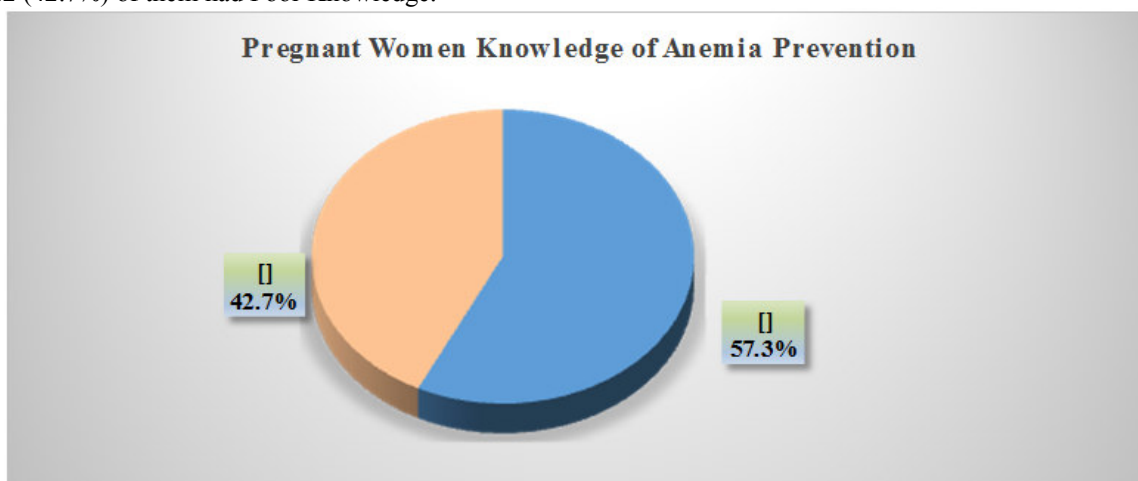
As shown on below table 2 of respondents' obstetric profile majority (53.8%) of them were multigravida and 40.6% were in second trimester. Almost all (94.4%) of respondents didn't get parenthood classes about anemia while 20.6% of participants have previous history of anemia.

**Table 2: Frequency Distribution of Obstetric Profile of the Respondents in the three public hospitals in West Shoa, Ethiopia, 2017.**

S. No.	Characteristics	Number	Percent
1	<b>Gravida (n=286):</b>		
	Primigravida	118	41.3
	Multigravida	154	53.8
	Grand Multigravida	14	4.9
2	<b>History of Any Illness (n=286):</b>		
	Yes No	25 261	8.7 91.3
3	<b>Parenthood Classes about Anemia (n=286):</b>		
	Yes No	16 270	5.6 94.4
4	<b>Stages of Pregnancy (n=286):</b>		
	First Trimester	61	21.3
	Second Trimester	116	40.6
	Third Trimester	109	38.1
5	<b>Previous History of Anemia (n=286):</b>		
	Yes No	59 227	20.6 79.4

**Pregnant Women Knowledge Regarding Prevention of Anemia.**

This study revealed that only 58.9% of participant women have known the meaning of anemia. However, around 71.6% of them able to identify the symptoms of anemia. Regarding causes of anemia majority (85%) of participants related to poor nutrition, while 51% also related to multiple pregnancy and spacing. 79%, 77.6% & 45.8% of the study participants consider importance of Iron supplements as for improvements of women’s health, prevention of anemia and improvement of baby’s health respectively. Majority (92.3%) of participants consider egg as iron reach food while 81.1% of them consider legumes. Only 42% of participants think they might be at risk of anemia during pregnancy. The below displayed Pie chart showed that only 164 (57.3%) of the pregnant mothers had Good Knowledge towards prevention of Anemia during pregnancy and highly significant number 122 (42.7%) of them had Poor Knowledge.



**Figure 1: Pie chart showing the level of Respondents’ Knowledge towards Prevention of Anemia during Pregnancy in the three public hospitals in West Shoa Ethiopia, 2017**

**Pregnant Women Practice Regarding Prevention of Anemia.**

As the current study reported that, only 31.5% of participants would not drink tea or coffee with meal, while 71% of them took iron supplements with fruits juices at least sometimes. 62.9% of participants use iron supplements regularly while 79.4% of participants have had regular three times meal per day.

The Bar chart displayed below showed that only 122 (50%) of the pregnant mothers had Good Practice towards prevention of Anemia during pregnancy and equal number which is very significant had Poor anemia prevention practice.

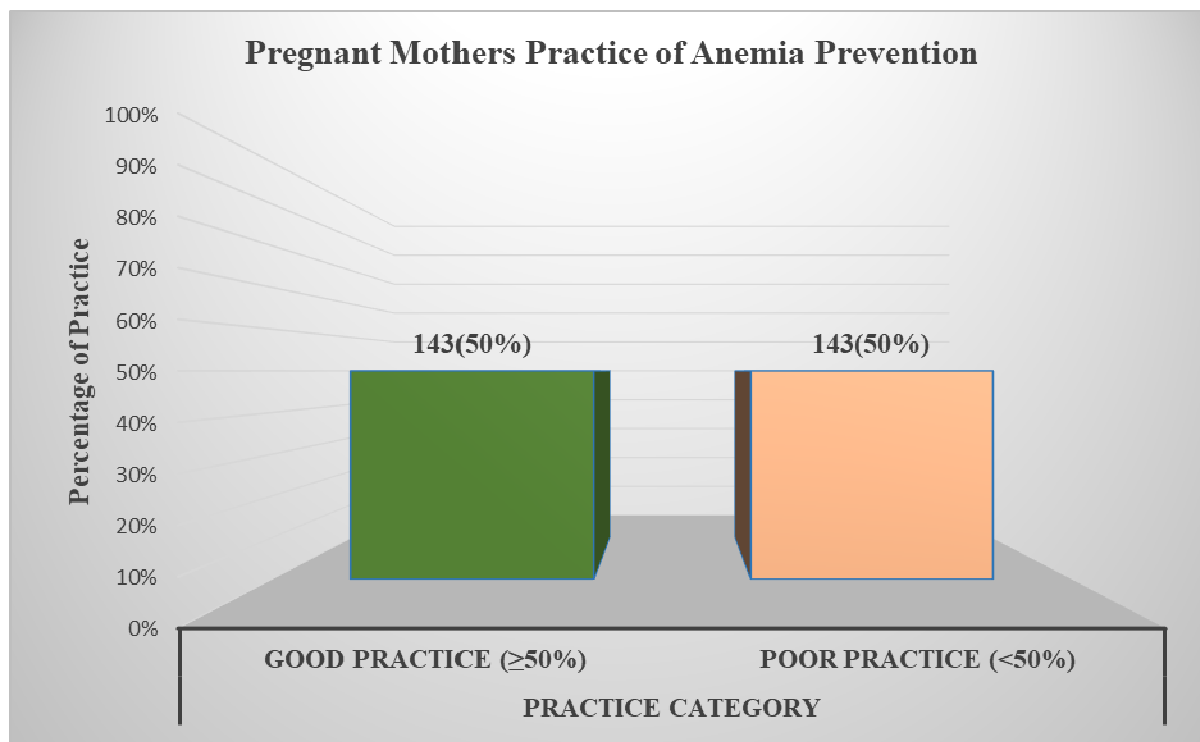


Figure 2: Bar chart showing the level of Respondents' Practice Regarding Prevention of Anemia during Pregnancy in the three public hospitals in West Shoa Ethiopia, 2017.

**Factors associated with knowledge of mothers towards prevention of anemia during pregnancy**

As displayed on table 3 below, *multivariable* logistic regression analysis was carried out to assess for significance of association among knowledge of participant women and selected independent variables. As to Crude OR with 95% CI, many variables were found to be associated with knowledge of women towards prevention of anemia during pregnancy while separately checked for associations. However, to minimize effect of independent variables from affecting each other, all important variables adjusted together with 95% CI and P-value <0.05 and significant associations were identified.

Higher educational status was found to be significantly associated to Prevention of Anemia during Pregnancy with P-value equal to 0.001. Therefore, mothers who attended 11th Grade & above had 5 times more good knowledge compared to illiterate, AOR=5.025(1.868, 13.519). In addition, study participants who live in urban area and nuclear family found to be significantly associated by having 2 times and 3.2 times more good knowledge about prevention of anemia during pregnancy with p-value calculated as 0.034; AOR=2.024(1.055, 3.882) and 0.000; AOR=3.293(1.732, 6.263) respectively.

On the other hand, previous history of anemia found to be significantly associated to prevention of anemia during pregnancy which revealed participants with such history were 2.73 times more knowledgeable with p-value 0.009; AOR=2.732(1.286, 5.805).

At the last participants with good practice of anemia prevention during pregnancy have found to be significantly associated to affect the participants' knowledge regarding anemia during pregnancy by becoming 4.3 times more knowledgeable than those practiced poorly with p-value=0.000; AOR=4.311(2.376,7.822).

Table 3: Results of multivariable Logistic Regression Analysis of Mothers' Knowledge towards Prevention of Anemia during Pregnancy in the three public hospitals in West Shoa Ethiopia, 2017.

Variables	Knowledge		Crude OR & 95% CI	Adjusted OR & 95% CI	P-Value
	Poor Knowledge (No)(%)	Good Knowledge (No)(%)			
<b>Education:</b>					
Illiterate	38(13.3%)	22(7.7%)	1.00	1.00	
Read & write	15(5.2%)	10(3.5%)	1.15(0.442-2.99)		
Primary School(Grade 1-8 <sup>th</sup> )	44(15.4%)	32(11.2%)	1.26(0.627-2.52)		
9 <sup>th</sup> -10 <sup>th</sup> Grade	13(4.5%)	37(12.9%)	4.92(2.16-11.18)		
11 <sup>th</sup> Grade & Above	12(4.2%)	63(22.0%)	9.07(4.03-20.39)	<b>5.03(1.87, 13.52)</b>	<b>0.001</b>
<b>Residence:</b>					
Rural	62(21.7%)	36(12.6%)	1.00	1.00	
Urban	60(21.0%)	128(44.8%)	3.67(2.2-6.13)	<b>2.02(1.06, 3.88)</b>	<b>0.034</b>
<b>Type of Family:</b>					
Joint	53(18.6%)	37(13.01)	.698		
Nuclear	68(23.9%)	127(44.6%)	2.67(1.6-4.47)	<b>3.29(1.73, 6.263)</b>	<b>0.000</b>
<b>Previous History of Anemia:</b>					
No	104(36.4%)	123(43.0%)	1.183		
Yes	18(6.3%)	41(14.3%)	1.926(1.044-3.55)	<b>2.732(1.286, 5.805)</b>	<b>0.009</b>
<b>Practice:</b>					
Poor Practice	91(31.8%)	52(18.2%)	1.00	1.00	
Good Practice	31(10.8%)	112(39.2%)	6.32(3.745-10.68)	<b>4.311(2.376,7.822)</b>	<b>0.000</b>

**Factors associated with Practice of mothers towards prevention of anemia during pregnancy**

As shown on the following table 4, *multivariable* logistic regression analysis was done to check for significance of association among practice of study participants and selected independent variables.

Even if many variables have identified to be significantly associated with the practice of participants regarding prevention of anemia during pregnancy by crude odds ration; to minimize effect of independent variables from affecting each other, all important variables adjusted together with 95% CI and P-value <0.05, participants' educational status and their knowledge towards prevention of anemia during pregnancy found to have significant associations.

Study participants who can read & write, attended grade 9th -10th and 11th Grade & Above found to be 3.26 times more having good practice with p-value=0.027; AOR=3.269(1.148, 9.311), 2.6 times more having good practice with p-value=0.030; AOR=2.607(1.098, 6.194) and 3.6 times more having good practice with p-value=0.002, AOR=3.672(1.623, 8.311) than illiterate study participants respectively.

And also mothers who have good knowledge regarding prevention of anemia during pregnancy have practiced good prevention of anemia during pregnancy 4.9 times more with calculated p-value 0.000; AOR=4.931(2.801, 8.678) than those participants with poor knowledge.

Table 4: Results of multivariable Logistic Regression Analysis of Mothers' Practice towards Prevention of Anemia during Pregnancy in the three public hospitals in West Shoa Ethiopia, 2017.

Variables	Practice		Crude OR & 95% CI	Adjusted OR & 95% CI	P-Value
	Poor Practice (No)(%)	Good Practice (No)(%)			
<b>Education:</b>					
Illiterate	44(15.4%)	16(5.6%)	1.00	1.00	
<u>Read &amp; write</u>	12(4.2%)	13(4.5%)	2.979(1.128, 7.867)	<b>3.269(1.148, 9.311)</b>	<b>0.027</b>
Primary School(Grade1-8 <sup>th</sup> )	45(15.7%)	31(10.8%)			
<u>9<sup>th</sup> -10<sup>th</sup> Grade</u>	20(7.0%)	30(10.5%)	4.125(1.845, 9.223)	<b>2.607(1.098, 6.194)</b>	<b>0.030</b>
<u>11<sup>th</sup> Grade &amp; Above</u>	22(7.7%)	53(18.5%)	6.63(3.105, 14.14)	<b>3.672(1.623, 8.311)</b>	<b>0.002</b>
<b>Knowledge:</b>					
Poor Knowledge	91(31.8%)	31(10.8%)	1.00	1.00	
<u>Good Knowledge</u>	52(18.2%)	112(39.2%)	6.323(3.745-10.675)	<b>4.931(2.801, 8.678)</b>	<b>0.000</b>

## DISCUSSION

Anaemia is the commonest haematological disorder which is responsible for 40-60% of maternal deaths in developing countries. There is high incidence in underdeveloped countries which increases maternal morbidity and mortality and perinatal mortality. All pregnant women are at risk for becoming anemic. That's because they need more attention regarding prevention of anemia than usual. However, the risk is higher if the women are pregnant with multiples, have had two pregnancies close together, vomit a lot because of morning sickness and a pregnant woman is teenager.

Many women begin pregnancy in a slightly anemic state. In pregnancy, mild anemia can rapidly become more severe; therefore, it needs immediate treatment. Iron deficiency anemia is the most common medical complication of pregnancy, primarily because of expansion of plasma volume without normal expansion of maternal hemoglobin mass.

One of the most important reasons of nutritional problem is lack of nutritional knowledge and consequently improper practice in this issue which can cause complications such as malnutrition and non-contagious diseases. Iron deficiency anemia affects over two billion people worldwide. The World Health Organization estimates that 58% of pregnant women in developing countries are anemic. However, having knowledge of anemia prevention and following through proper practice can completely prevent anemia during pregnancy (5).

Therefore, this study has addressed part of this gap of problem to save these much life of pregnant women from dying of preventable anemia by assessing pregnant women's knowledge and practice regarding prevention of anemia among ANC attendants in governmental hospitals at West Shoa Zone, Ethiopia.

As planned the study has revealed the level of Respondents' knowledge and practice regarding prevention of anemia during pregnancy, and identified some socio-demographic characteristics and related factors that affect significantly the pregnant women's knowledge and practice to prevent anemia.

This study showed that level of respondents' knowledge and practice concerning anemia prevention during pregnancy was low. Among the respondents of this investigation only 57.3% of them have good knowledge about prevention of anemia during pregnancy while the remaining significant percent 42.7% have poor knowledge. In addition to this the respondents' good practices to prevent anemia during pregnancy was also found to be as low as 50% and the remaining half percent of respondents demonstrate poor practice to prevent anemia from occurring during pregnancy. This study showed slight improvement than study previously conducted in teaching hospital of Kathmandu which revealed only 48.7% of mothers have adequate knowledge and 34% of study participants have good practiced regarding prevention of anemia during pregnancy. This slight difference might be due to study period and place differences (3).

As regards to the effect of dependent variables on each other, having good knowledge about prevention of anemia during pregnancy among study participants significantly associated with good practice to prevent anemia during pregnancy with calculated p-value 0.000; AOR=4.931(2.801, 8.678). Similarly, having good practice of prevention of anemia occurrence during pregnancy have found to be significantly associated to affect the participants' knowledge regarding anemia prevention during with p-value=0.000; AOR=4.311(2.376, 7.822). This finding is similar with the study done on "knowledge, attitude and practice of pregnant women in



correlation with anemia in India that identified the lower knowledge about anemia in pregnant women increased risk of anemia 'five times' and the poor practice about prevention of anemia among pregnant women increased anemia risk 'six times'(3).

The current study has revealed that multiple factors can affect significantly the knowledge of pregnant women to prevent anemia during pregnancy. Accordingly, Higher Educational status (11th Grade & Above), urban residency, and having nuclear family have found to affect significantly the knowledge of participants regarding prevention of anemia during pregnancy with the calculated P-value = 0.001 AOR=5.025(1.868, 13.519), P-value = 0.034; AOR=2.024(1.055, 3.882) and P-value = 0.000 AOR=3.293(1.732, 6.263) respectively. Additionally, having previous history of anemia was also identified to significantly affect participants' knowledge to prevent anemia with calculated p-value = 0.009; AOR=2.732(1.286, 5.805). Which is similar with study conducted in South part of Ethiopia that showed awareness of anemia was significantly associated with occupational status and educational status of respondents (15).

On the other hand, this study has shown that there were also factors that can affect significantly the practice of pregnant women to prevent anemia during pregnancy. Therefore, multiple educational levels such as ability to read and write, 9<sup>th</sup> – 10<sup>th</sup> grade and 11<sup>th</sup> & above have found to be significantly associate with practice of study participants to prevent anemia during pregnancy with p-value=0.027; AOR=3.269(1.148, 9.311), p-value=0.03; AOR=2.607(1.098, 6.194) and p-value=0.002, AOR=3.672(1.623, 8.311) respectively.

### Conclusion

Depending on the study findings, it is concluded that half of the study participants attending Antenatal Care at West Shoa Zone Governmental Hospitals have Poor Knowledge on prevention of anemia and poor skills on ways anemia prevention during pregnancy. Both knowledge and practice have found to affect each other significantly and those respondents with good knowledge found to have good practice and vice versa.

Factors such as being enrolled at Higher Educational, living in urban, having nuclear family type and study participants' previous history of anemia have found to affect their knowledge regarding prevention of anemia during pregnancy significantly.

Similarly, the research finding also revealed that educational and have good knowledge towards prevention of anemia had demonstrated significantly associate with practice of prevent anemia during pregnancy.

### Recommendations

Strengthening Health Education on Anemia Prevention during ANC follow up and preparations of brochure which describes symptoms, risks factors and ways of Anemia preventions.

Private health facilities should involve in support of societal awareness towards prevention of anemia during pregnancy.

All study area surrounding health facilities and offices should work on strengthening the awareness and utilization of preventive methods of anemia during pregnancy.

Further and detailed survey is better to be conducted Anemia prevention and factors associated with it in different parts of the country for representativeness of the result for the Nation;

Qualitative study research design should also better to be considered to explore deeply regarding anemia during pregnancy;

Therefore, Policy makers would be better consider those factors contributed in prevention of anemia during pregnancy.

### Competing interests

*The author(s) declare that they have no competing interests.*

### Authors' Contributions

**Jayanthi gopal, Keneni Berhanu, Daka and Dereje Bayissa Demissie** conceptualized the study, designed the study instrument and conducted the data analysis and wrote the first draft and final draft of the manuscript.

**JG, DBD and KBD:** Approved the research proposal with some revisions, participated in data analysis, revised subsequent drafts of the paper and involve in critical review of the manuscript. All authors read and approved the final manuscript.

### Abbreviations

- ANC** -Antenatal Care
- CDC** -Centers for Disease Control and Prevention
- IDA** -Iron deficiency anemia
- LBW** - Low birth weight
- LSCS** -Lower segmental caesarean section
- MCH** -Maternal and Child Health
- MCV** -Mean cell volume

**RBC** -Red blood cells  
**SPSS** -Statistical packages for social science  
**TIBC** -Total iron binding capacity  
**WHO** -World Health Organization

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