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Prevalence and Associated Factors of Anemia among Pregnant Women's Attending Antenatal care service in Bahir Dar City Public Health Institution, North West Ethiopia, 2019

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Abstract

Background: This health institution cross-sectional study was determine the prevalence and associated factors of anemia among pregnant women'sattending ANC service in Bahir Dar city public health institution North Western Ethiopia.

Result: A total of 381 study subjects were interviewed in this study .The mean age (standard deviation) of the participants was 26.1±4.322 years. Out of the total study respondents 325(85.3%) of them were able to read and write. The overall prevalence of anemia in the study was 32.5%. Multivariate logistic regression was done for variables that showed association during bivariate analysis. Birth space of the respondents being less than two years were 3.5 times more likely to be anemic compared to birth space greater than two years. (AOR =3.523, 95%CI: (1.502, 8.265). Those who eat fruit less than three times per week were 3.2 times more likely to be anemic compared to those who eat greater than or equal to three times per week. (AOR= 3.165, 95%CI: (1.235, 8.114).

Key word: Anemia, factors associated with anemia, pregnant women

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Introduction

Anemia is a major public health problem on both developing and developed countries. It affects over 2 billion people globally and one fifth of maternal death refers to anemia worldwide. It is defined as situational where pallor and weariness occur due to insufficient red blood cell and their oxygen carrying capacity to meet the body's physiologic needs. Anemia during pregnancy also defined as a hemoglobin concentration less than 11g/dl and it results premature birth, low birth weight, fetal impairment and death. The major causes of anemia are iron deficiency, vitamin A deficiency, malaria infection and hookworm [1-4].

In Asia and Africa anemia is a key public health problem among pregnant women those belonging to nutritional problem. Anemia affects both physical and mental cognitive of the individual. According to different studies, the prevalence of anemia is very high especially in rural areas of Ethiopia [5-9]. Different studies was conducted in Ethiopia in several areas to determine the prevalence of Anemia which revealed that 21.6% in Mekelle Town, 39.94% WolaytaSodo town, 27.6% in Butajira, 57.2% in Diredewa, 45.5% in FelegeHiwotReferal hospital and 35.48% in TikurAnbesa referral hospital [10-15].

Several factors like maternal educational status and socio economic factor are the major contributory factors for the increments of the prevalence of Anemia [16-18). Adequate supplement of nutrition and prevention of parasitic infections are very important for pregnant mothers to prevent development of Anemia during pregnancy and postnatal period. Pregnant women with lower level of dietary diversity score were around more likely to develop anemia than those with higher dietary diversity score [10-20]. Therefore our research evidences indicate that the magnitude and determinants of anemia in pregnant mothers. It would have a vital merit for initiating, planning and implementation of intervention programs. The findings would be immensely helpful to local district health office.

Methods

Institutional based cross-sectional study design was conducted in Bahir Dar city governmental health facilities from May to

June 2019. The town had three governmental hospitals and ten health centers that provide antenatal care services. The sample size was estimated using single population proportion formula with 95% CI and precision (w) 0.05 based on the assumption: the study which was conducted in Gondar which revealed 25.2% magnitude of anemia in pregnant women [20]. After computing the appropriate formula, the total sample size was 381.

After selecting the health facility based on average monthly coverage of pregnant mother for each health institution and put proportional allocation for each health facility by multiplying total pregnant number for each health institution with the total sample size and divided by total pregnant women in the selected health institution and the interval of K=N/n (844/381=2) so the interval was used to select the study participant from each selected health facility.

The data was collected using semi structure questionnaire and laboratory investigation. The interview and physical examination was conduct at antenatal care department on the selected health facilities by six graduate Nursing students. During data collection supervision was done on daily bases three Health Officers. Statistical analysis was made using SPSS version 23. Descriptive summary (Frequency distribution, proportion, mean & standard deviation) was used to summarize the variable. Bivariate and multivariate logistic regression were done to assess the association of factors with anemia by calculating odds ratios, their 95% CI and P-value less than or equal to 0.05 as taken as statistically significant. The variables which show p- value less than 0.2 during bivariate analysis, was retain for multivariate logistic regression.

Ethical clearance was obtained from Bahie Dar University, College of Medicine and Health Sciences review committee. Permission was also requested from the administrators of selected health institutions. The data was collected after obtained verbal informed consent from each study participants.

Results

The total of 381 study subjects with 100% response rate were interviewed .The mean age of ± (standard deviation) of the participants was 26.1±(4.322) years. Around half of the study participants 170(44.6%) were above the age of 31 years. Out of the total study respondents 325(85.3%) of them were able to read and write and 56 (14.7%) of them were unable to read and write. Regard to their occupation majority 189(49.6%) of the participant were house wife 69(18.1%) of the respondent were governmental employer (Table 1).

Among the participants 215(56.4%) had more than two delivers previously. From total participants, 118(54.9%) of them had birth interval of greater than or equal to two years between the pregnancies. Among the respondents only 99(26.0%) of have past medical history of intestinal parasitic infection. A total of 174(45.7%) participants were in the 3rd trimesters during data collection period. The overall prevalence of anemia in this study population was 32.5% (Table 2).

Multivariate logistic regression was done for variables that showed association during bivariate analysis from variables which were entered to multiple logistic regression were birth space, fruit,

Table 1: Socio-demographic characteristics of study participants of Anemia on pregnant mothers in Bahir Dar city health facilities, North West Ethiopia, 2019.

NO	Variables	Category	Frequency	Percentage
1	Age	18-24	128	33.6
		25-30	83	21.8
		>31	170	44.6
2	Religion	Orthodox	297	78
		Muslim	59	15.5
		Protestant	25	6.5
3	Educational status	Unable to read and write	56	14.7
		Primary	67	17.6
		Secondary	148	38.8
		Above	110	28.9
4	Marital states	Married	379	99.5
		Divorced	2	0.5
5	Occupation	Housewife	189	49.6
		Gov't employee	69	18.1
		Merchant	30	7.9
		Other	93	24.4
6	Average monthly income	<2000	103	27.0
		2001-5000	156	40.9
		5001-10000	97	25.5
		>10001	25	6.6
7	Family size	<five	292	76.6
		≥five	89	23.4
8	Nutritional related education	Yes	96	24.2
		No	285	74.8

meals, meat and intestinal parasites were significantly associated with anemia at (p value of <0.05). Birth space of the respondents being less than two years were 3.5 times more likely to be anemic compared to birth space greater than two years. (AOR =3.523, 95%CI: (1.502, 8.265).

Those who never eat meat were 7.5 times more likely to be anemic compared to those who eat meat greater than or equal to three times per week. (AOR= 7.515, 95%CI: (1.289, 43.796). Those who eat fruit less than three times per week were 3.2 times more likely to be anemic compared to those who eat greater than or equal to three times per week. (AOR= 3.165, 95%CI: (1.235, 8.114).Those who eat meals less than three times per day were 0.2 times less likely to be anemic compared to those eat meals greater than or equal to three times per day.

Table 2: Reproductive and health related characteristics of the respondent pregnant mothers in BahirDar city governmental health facilities, 2019.

NO	Variable	Category	Frequency	Present
1	Number of pregnancy	<2 ≥2	166 215	43.6 56.4
2	Birth space	<2 years ≥ 2 years	97 118	42.1 54.9
3	Gestational age	1st trimester 2nd trimester 3rd trimester	53 154 174	13.9 40.4 45.7
4	Duration of Menses	<5 days ≥5days	220 93	70.3 29.7
5	Treated for intestinal parasite	Yes No	99 282	26.0 74.0
6	Malaria	Yes No	32 349	8.4 91.6
7	ITN use	Yes No	333 48	87.4 12.6

Table 3: Association between some selected variables and prevalence of Anemia in pregnant mothers, in Bahir Dar city health facilities, North West Ethiopia, 2019.

Variable	Category	Frequency	Anemia		COR(95%CI)	AOR(95%CI)	P value
			Yes	No			
Age	15-24 25-30 >31	128 83 170	47 14 63	81 79 107	1.00 **3.274(0.178,0.689)** 0.985(0.831,1.632)	1.00	
Family size	<5 ≥5	292 89	107 17	185 72	1.00 **2.496(0.229,0.729)**		
Birth space	<2 years ≥2 years	97 118	53 25	44 93	**0.223(2.184,7.172)** 1.00	**3.523(1.502,8.265)** 1.00	**0.004**
Duration of menses	<5 ≥5	220 93	49 53	171 40	1.00 **4.624(2.575,7.770)**	1.00	
Gestational age	1st trimester 2nd trimester 3rd trimester	179 68 134	73 19 32	106 49 102	1.00 0.563(0.307,1.034) **0.456(0.277,0.748)**	1.00	
Fruit per week	≥3/week <3/week	249 132	67 57	182 75	1.00 **2.064(1.324,3.218)**	1.00 **3.165(1.233,8.114)**	**0.016**
Vegetable per week	≥3/week <3/week	254 127	72 52	182 75	1.00 **1.753(1.121,2.740)**	1.00	
Meat per week	≥3/week <3/week Never	135 215 31	30 79 15	105 136 16	1.00 **2.033(1.244,3.323)** **3.281(1.455,7.3970)**	1.00 3.82(1.584,0.565) **7.515(1.289,43.786)**	**0.025**
Iron intake	Complete Incomplete	143 190	35 69	108 121	1.00 **0.568(0.351,0.921)**	1.00	
Milk	Yes No	141 240	67 62	79 178	1.00 **2.211(1.429,3.421)**	1.00	
Meals per day	≥3/day <3/day	309 72	90 34	219 38	1.00 **0.459(0.272,0.775)**	1.00 **0.165(0.057,0.475)**	**0.001**
Treated with anti-Helminths	Yes No	141 240	62 62	79 178	**2.253(1.450,3.501)** 1.00	**5.280(0.078,0.462)** 1.00	**0.001**

(AOR= 0.165,95%CI: (0.57,0.475). Pregnant women during this pregnancy who were untreated with helement were 5.3 times more likely to be anemic compared to who were treated with helements. (AOR=5.280. 95%CI: (2.166, 12.874) (Table 3).

Discussion

Anemia in pregnancy is a common problem in developing countries and a major cause of morbidity and mortality. It has a significant impact on the health of the fetus and mother. The present study was carried out to determine the prevalence and associated factors of anemia among receiving ANC at selected study areas.

The overall prevalence of anemia in this study using a cut off level of Hg <11g/dl was 32.5%. This is considerably comparable to similar studies conducted in WolaytaSodo 39.9% [11] and Butajira 27.6% (12).The result of this study is also in agreement with 2008 WHO's report in which 41.8% pregnant were suffering from anemia [20].

The prevalence of anemia the present finding was higher than similar study conducted in Mekelle (21%) [10] and Gonder (25.5%) [20].The possible reason for higher prevalence of anemia in the current study might be differences in monthly income [10].

And less than the similar study conducted in India (58.3%) [9], Asia (52.5%) [5], Africa (61.3%) (6, 3), Dire Dawa(57%) [13] and Bahir dar (45.5%) [14].The possible reason for the lower prevalence of anemia in the current study might be difference in the study area (geographical variation) and administration of iron supplementation in health facilities, which is help full in reducing anemia during pregnancy [18].

However the present study showed lower prevalence of anemia than a similar study conducted in BahirDar (FHRH) which was reported in 2012/2013 to be 45.5% [14]. The possible reason for the lower prevalence of anemia in the current study might be the time gap between the previous studies.

In this study Anemia prevalence increase with a birth space of <2 years as compared ≥2 years and similar with reported in other study [10].This might be due to bleeding per deliveries

In this study pregnant women with a history of heavy menstrual cycle was not significantly associated however, the similar study conducted in Mizantepi South West Ethiopia showed the heavy menstrual cycle was significantly associated [20]. This might be due to feeding of iron rich food difference to replace the loosed iron trough bleeding.

This study reveals that the presence of untreated soil transmitted parasite infection in particularly hookworm which was significantly associated with anemia in pregnant women (AOR= 5.280. 95%CI: (2.166, 12.874). This is consistent with study conducted in Nekemit [20] and Gondar [21]. This is because adult hookworm parasites attack and injure upper intestinal mucosa and also ingest blood. These bring about gastro intestinal blood loss and induced depletion of iron, folic acid and vitamin B12 that ultimately lead to anemia [20].

This study stated that the consumption of meat was also another factor which showed significant association with anemia in pregnant women. Pregnant women with never eating meat were 7.5 times at higher risk of developing anemia than pregnant mother who ate meat more than three times per week. This finding is consistent with other study conducted in Mekelle [10]. This might be due to income difference.

Conclusion

The finding of this study showed that pregnant women who ate meals ≥3 time per days were less likely to be anemic compared to those who ate meals <3times per days. The similar study done in Dire Dawa showed that meals were significantly associated with anemia. The possible reason might be lack of nutritional related education.

Fruit is also significantly associated with anemia in pregnant women. Pregnant women with ate fruit <3 times per week were 3.2 times at higher risk of developing anemia than pregnant mother who ate fruit more than three times per week. This finding is in agreement with a study conducted in Dire Dawa.

This study did not observe any relation between prevalence of anemia and increasing gestational age, suggested that all pregnant women were susceptible to anemia throughout the gestational period. In order to avoid anemia during pregnancy receiving early ANC would serve as an important preventive measure. The same study was observed in a study conducted in Gonder, Nekemit, Mizantepi and Mekele, respectively.

Limitations of the study

Our study investigate through the quantitative design only, however, qualitative study design should also be examined.

Health facility based cross sectional study doesn't much identify the factors contribute the prevalence of Anemia in pregnant Mothers like community based and longitudinal studies. As a result another longitudinal study will be necessary to explore determinants in detail.

Abbreviations

ANC: Antenatal care

CI: Confidence Interval

IV: Intravenous

SPSS: Statistical Package for Social Sciences

Declarations

Ethics approval and consent to participate

Ethical clearance was obtaining from Bahir Dar University Ethical Review Board. The aim of the study was clearly explaining to participant and hospital officials. Privacy of each respondent was maintained throughout the data collection process. The data collection was beginning after obtained informed consent from each participant. Participants also were told the objective of the study and gave the right to refuse, stop or withdraw at any time of data collection.

Availability of data and materials

All data generated or analyzed during this study are available in the library of Bahir Dar University for accessible of students and other researchers.

Competing interest

The authors declare that no competing interests.

Funding statement

Not applicable.

Author's contribution

HG Conceived the idea for the research and wrote the framework, design of the study and performed the statistical analysis. MA also facilitates data collection and check before data entry. All authors have read and approved the manuscript.

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