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Non-Adherence to Iron/Folate Supplementation and Associated Factors among Pregnant Women who Attending Antenatal Care Visit in Selected Public Health Institutions at Hosanna Town, Southern Ethiopia, 2016

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Abstract

Background: Iron supplementation alone or in combination with folic acid is the strategy to alleviate iron deficiency anemia during pregnancy. However, non-adherence is an issue for not reducing the problem in these populations.

Objective: To determine non-adherence to Iron/Folate Supplementation and associated factors among pregnant women who attending antenatal care visit in selected public health institutions at Hosanna Town, Southern Ethiopia.

Methodology: The study was conducted at public health facilities found in Hossana town, southern part of Ethiopia. An institutional based cross-sectional study design was performed. Randomly selected three hundred and sixty five women were included in the study. Collected data were edited, coded and entered to Epi info version 3.1 and exported to` SPSS version 20. The association of every independent variable with the response variable was evaluated using bivariate analysis. Statistically significant variables were considered in the multivariate model using SPSS version 20.

Results: Among women participated in the study, 30.41% were non adherent to iron/folate supplementation. Compared to women aged 15-24 years, women above 35 years of age 4.16 (95% CI: 1.24, 3.95) had higher non adherence. Women who didn't get nutrition counseling 3.19 (95% CI: 1.16, 3.74) and women lacking knowledge of anemia 16 (95% CI: 4.34, 6.92) were associated with a higher likely hood of non-adherence.

Conclusions and recommendations: Considerable proportion of pregnant women was non-adhered. Age, income, knowledge about hemoglobin status, knowledge about anemia and nutritional counseling were significant predictors for non-adherence. Therefore, promoting the benefits of iron/folic supplementation, increasing the awareness of women about anemia and nutrition counseling through health education activities is vital for decreasing non adherence.

Keywords: IFA: Iron /Folic acid supplement; Non adherence; Pregnancy; Anemia

Introduction

Background

Despite the largely preventable causative factors, maternal mortality is still a problem in many societies [1]. Anemia during pregnancy is one of the risk factors for maternal mortality [2]. Globally around half of the anemia burden is due to iron deficiency [3]. According to WHO 2006 report, 61.7% of Ethiopian pregnant women had anemia and it is classified under a severe public health problem in the country [4]. Most women do not have adequate iron stores to handle the demands of pregnancy. Depleted iron store will lead to anemia during pregnancy with an increased risk of fetal-maternal mortality and morbidity [5]. Moreover, prematurity, spontaneous abortions, intrauterine growth retardation, low birth weight, and fetal deaths [6-8], low mental development [9] are among the complications of maternal anemia.

The most common anemia in women in developing countries is usually related firstly to: inadequate iron stores due to nutritional deficiency and intestinal helminthic infections, Secondly, due to inadequate intake of folate, and thirdly due to malarial infection leading to chronic hemolytic states [10,11]. Ideally, Iron Deficiency Anemia (IDA) can be controlled by iron supplementation, fortification of foods with micronutrient, and improving food security and dietary diversity [3].

Oral dosage form of iron is the first line treatment because of its effectiveness and less cost. However, there are populations who were given oral iron and do not take it appropriately. Among the mentioned factors that contribute to poor adherence are adverse events [12]. Maternal age, number of previous births, HIV status and a history of abortion [13] were mentioned. Moreover, it is known that adherence to iron-folate supplementation can reduce the risk of maternal anemia.

However, little is known about the factors leading to non-adherence in Ethiopia. Therefore, this study aimed to determine non-adherence to Iron/Folate Supplementation and associated factors among pregnant women who attending antenatal care visit in selected public health institutions at Hosanna Town, Southern Ethiopia. The findings of this study would indicate interventions and better management of anemia during pregnancy.

Methods and Materials

Study setting

The study was conducted from March 10 to April 20, 2016 at public health facilities found in Hossana town that is found at the southern part of Ethiopia. The town has one zonal Hospital and 3 health centers providing services such as antenatal care, basic emergency obstetric care, curative, out-patient and in-patient services, family planning etc. Iron-folate supplementation is a routine service given for women having ANC follows up. All of the four health facilities are included in the study.

Study design

An institutional based cross-sectional study design was performed to determine non-adherence to Iron/Folate Supplementation and associated factors among pregnant women who attending antenatal care visit in selected public health institutions at Hosanna Town, Southern Ethiopia.

Source population: The source population included all pregnant women who attending antenatal care visit in public health institutions at Hosanna Town, Southern Ethiopia

Study population: The study population included those pregnant women who attending antenatal care visit in selected public health institutions at Hosanna Town, Southern Ethiopia

Sample size determination and sampling procedure

Sample size determination: The sample size was calculated using a single population proportion formula assuming, I did not find prior study proportion of non-adherence to iron folic supplementation and used p=50% where n=sample size required; Z=the critical value of the confidence level corresponding with the value of α/2; d=the desired level of precision and p =the estimated proportion of the non-adherence to iron folic supplementation. Considering 5% margin of error (d) and confidence level of 95% (za/2=1.96). Based on the above information a sample size was 384.

$$n = \frac{\left(Z_{\alpha/2}\right)^2 p(1-p)}{d^2}$$

$$n = \frac{(1.96)^2 * 0.5 * (1-0.5)}{(0.05)^2} = 384 = 10\% \, non$$

$$- response \, rate = 384 + 38 = 422.$$

Sampling technique: Initially all of the four health facilities were selected. The sampling frame was all pregnant women attending antenatal care clinic and supplied with iron-folate supplement. Ultimately, participants were selected by systematic random sampling

technique. The inclusion criteria being those women who took iron/folate supplement at least for two months before the data collection period and who were able to hear and/or speak and not mentally ill (Figure 1).
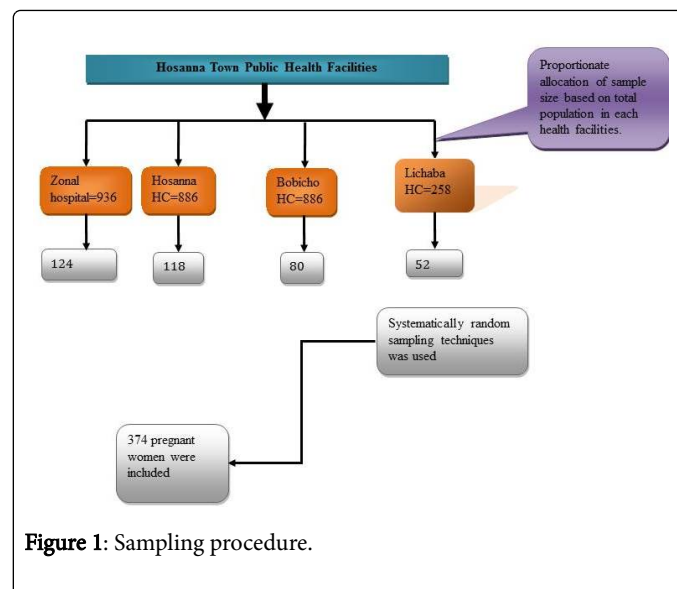
Figure 1: Sampling procedure.

Data collection

Demographic characteristics and information on use of iron supplements were collected by personal interview with pre structured questionnaire. The questionnaire was translated in the local language. The data were gathered by 5 trained data collectors and one supervisor. Data collectors and supervisors reviewed every questionnaire for completeness and for logical consistency at daily basis and counter checked by the principal investigator at the end of each day. Variables such as hemoglobin level were obtained from medical records in the health facility.

Data management and analysis

Collected data were edited, coded and entered to Epi info version 3.1 and exported to` SPSS version 20. Frequency, percentage and descriptive summaries were used to describe the study variable using univarite analysis. Logistic regression was carried out to identify factors associated with non-adherence to Iron/Folate Supplementation. Independent variables found to be significant in the simple binary logistic regression analysis at a cut-off point of p-value <0.25 with 95% confidence interval were included in the multiple binary logistic regression models [14].

Adjusted odds ratios with their 95% confidence intervals and p-value of less than 0.05 were considered to have significant association between the outcome and the explanatory variables.

Presence of possible confounders and interaction effects were investigated by computing relative changes on ß coefficients at a cutoff point 15% [15]. Occurrence of multicolinearity was checked for the final model with cut-off point mean of variation inflation factor (VIF) less than five [16]. The model fitness was checked using Hosmer and Lemeshow [17].

The mean Variance Inflation Factor (VIF) value was 3.9 that confirm the absence of significant collinearity among predictors.

Moreover, the statistically non-significant value of the Hosmer-Lemeshow statistics (prob>chi^2=0.21) showed fitness of the model.

Ethical considerations

Ethical clearance was obtained from Health Research and Post Graduate College of Public Health and Medical Sciences Ethical Review Board of Jimma University. Verbal consent was requested from every study pregnant women during data collection time after explaining the objective of the study with clear local language.

Operational definitions

Non- adherence was defined as not taking iron-folic tablets at least 4 times per week in the previous one month preceding the survey. And Knowledge on anemia was defined as those who heard about anemia and know at least one of signs and symptoms of anemia.

Results

Sociodemographic characteristics of respondents

Data were gathered from 365 women attending antenatal care clinic with a response rate of 86.6%. The mean age of the respondents was 24.65 (± 4.27) with majority (73.4%) of women being above 25 years of age. Around three quarter (74.2%) of the subjects were married with educational level of primary education and above.

In this study, most of the respondents 290 (79.45%) were multiparus. The prevalence of Non adherence to Iron folic acid supplementation among pregnant mothers attending the public health institutions in the Hossana city was 30.41%. Out of 263 respondents whose hemoglobin level was measured, 179(68.1%) had a diagnosis of anemia. Regarding the knowledge on anemia, 74% of women not heard of anemia.

Factors associated with pregnant women's non-adherence to iron folic supplementation

Seventeen factors were considered as predictor variables. Ultimately Age, Monthly income, Knowledge on Anemia, Hemoglobin level during pregnancy, Nutrition counseling and religion were the significant predictors.

Compared with pregnant women in the age group of 15-24 years, women with in age group of 25-34 years and above 35 years of age had a higher non adherence to Iron folic supplementation with an adjusted OR of 4.48 (95% CI:1.04-4.29) and 4.16(95% CI: 1.24,3.95) respectively. Similarly, compared to those women with monthly income 2001 and above ETB, women with monthly income 500-1000 ETB had 4 (95% CI: 1.36-4.03) times higher odds of non-adherence to Iron folic acid supplementation. A women who had no information on anemia had 16 (95% CI: 4.34, 6.92) times higher odds of non-adherence of Iron Folic acid supplementation than those women who had the knowledge on anemia (Table 1).

A women whose Hgb level was less than 11g/dl had less odds of non-adherence to Iron folic acid supplementation than those women whose Hgb level was unknown with an adjusted OR of 0.11(95% CI: 0.12-0.61). Those mothers who didn't get nutrition counseling were 3.19 (95% CI: 1.16,3.74) times higher odds of non-adherence to Iron acid supplementation than those women who got nutrition counseling. Compared to a women who were catholic followers, women who claimed to belong to protestant religion were 6.67 (95% CI: 1.50, 5.64) times higher odds of non-adherence to Iron folic acid supplementation (Table 1).

Variables	Non-Adherence to iron folic supplementation		COR[95%CI]	AOR[95%CI]
Age of respondent(year)	No	yes		
15-24	51[76.12%]	16[23.88%]	1	1
25-34	37[59.68%]	25[40.32%]	7.15*[1.01, 4.59]	4.48*[1.04, 4.29]
>=35	42[64.62%]	23[35.38%]	1.74[0.81,3.72]	4.16*[1.24, 3.95]
Women education				
No formal education	59[72.84%]	22[27.16%]	1	1
Primary education	33[66%]	17[34%]	1.38[0.64 ,2.96]	0.58[0.13, 2.57]
Secondary and above	38[60.32%]	25[39.68%]	1.76[0.87, 3.56]	0.40[0.99, 1.65]
Husband education				
No formal education	70[86.42%]	11[13.58%]		
Primary education	93[72.66%]	35[27.34%]	2.39*[1.14, 5.04]	
Secondary and above	81[62.79%]	48[37.21%]	3.77**[1.81, 7.8]	
Marital status				
Single	36[92.31%]	3[7.69%]	1	
Married	186[68.63%]	85[35.38%]	5.48**[1.64, 8.31]	

Others [widowed&divo	22[78.57%]	6[21.43%]	3.27[0.74, 4.43]	
Family size				
< 4	126[72.83%]	47[27.17%]	1	1
>=4	128[66.67%]	64[33.33%]	1.34[0.85, 2.10]	0.91[0.40, 2.03]
Family support				
Yes	165[70.21%]	70[29.79%]	1	
No	89[68.48%]	41[31.54%]	0.92[0.58,1.46]	
Monthly income[birr]				
500-1000	102[62.58%]	61[37.42%]	2.39**[1.25,4.57]	4.00**[1.36, 4.03]
1001-2000	92[72.44%]	35[27.56%]	1.52[0.76, 3.02]	1.74[0.72, 4.23]
2001 and above	60[80%]	15[20%]	1	1
Women occupation				
unemployed	112[69.57%]	49[30.43%]	1.00[0.63, 1.57]	1.04[0.44, 2.43]
employed	142[69.61%]	62[30.39%]	1	1
Ethnicity				
Hadiya	175[68.80%]	78[31.20%]	1	
kembata	44[67.69%]	21[32.31%]	1.75[0.77, 3.99]	
Gurage	7[63.64%]	4[36.36%]	1.84[0.72, 4.71]	
Other(silite)	31[79.49%]	8[20.51%]	2.21[0.51,9.47]	
Parity				
Primiparous	68[90.67%]	7[9.33%]	1	
Multiparous	186[64.14%]	104[35.86%]	5.4***[2.4,4.26]	
Knowledge of anemia	No	yes		
Yes	55[57.89%]	40[42.11%]	1	1
No	199[73.70%]	71[26.30%]	0.79[0.51, 1.25]	16***[4.34, 6.92]
Current anemia				
Yes	174[68.24%]	81[31.76%]		
No	80[72,73%]	30[27.27%]		
Hb level pregnancy				
None	75[73.53%]	27[26.47%]	1	1
Less than 11g\dl	122[68.16%]	57[31.84%]	1.29[0.75, 2.23]	0.11*[0.12, 0.61]
Greater than 11g/dl	57[67.86%]	27[32.14%]	1.32[0.69, 2.48]	1.23[0.32, 2.31]
Expected delivery date				
Yes	130[67.36%]	63[32.64%]		
No	124[72.09%]	48[27.91%]	1.25[0.79, 1.96]	
Nutrition counseling				

Yes	126[65.63%]	66[34.38%]	1	1
No	118[80.82%]	28[19.18%]	2.21**[1.32,3.67	3.19**[1.16, 3.74]
Knowledge of IFA				
Yes	98[67.12%]	48[32.88%]		
No	156[71.23%]	63[28.77%]	1.21[0.77, 1.90]	
Number of pregnancy before this one				
One	80[80%]	20[20%]	1	
More than one	164[68.91%]	74[31.09%]	1.8*[1.03, 3.16]	
Religion				
Orthodox	89[67.42%]	43[32.58%]	2.57[0.71, 9.32]	0.45[0.75, 2.13]
Protestant	131[68.23%]	61[31.77%]	2.48[0.69, 8.8]	6.67**[1.50, 5.64]
Muslim	18[81.82%]	4[18.18%]	1.18[0.22, 6.12]	0.63[0.11, 4.19]
Others [catholic]	16[84.32%]	3[15.79%]	1	1
Key 1=references group; *=PV<0.05; **=PV<0.001; ***= PV<0.0001; CI = confidence interval; COR=Crude Odds Ratio; AOR=Adjusted Odds Ratio				

Table 1: Bivariate and Multivariate logistic analysis depicting factors associated with pregnant women's non-adherence to iron folic supplementation in Hosanna Town, Southern Ethiopia, 2016 (n=365).

Discussion

Although it occurs in all individuals, anemia during pregnancy is a major health problem in many developing countries. One of the Strategies to prevent and treat this condition is routine iron/folate supplementation for all pregnant women [18]. However, non-adherence is an issue for effectiveness of the intervention.

The WHO's estimated prevalence of anemia for Ethiopian pregnant women during the year 2006 was 61.7%. As per this report, anemia is a severe public health problem of the country [4]. Similar to this report, was our finding that reported 68.1%. Our study finding, nevertheless conducted after 10 years, it asserted the fact that the problem still remained the same particularly in our study area. Two studies from Northern and Southern Ethiopia reported a prevalence of 93% and 33.2% % respectively [12,19]. Similarly 62.2% of pregnant women were found anemic in a study done at north eastern Egypt which is comparable to our study [20]. This might happen as a result of women's knowledge deficit regarding the case, the prevailing low socioeconomic status, the higher Total Fertility Rate (TFR) in the country, lack of women's pre-pregnancy preparedness, unplanned pregnancy, and women's poor adherence to Iron supplement.

In the present study the prevalence of self-reported non adherence rate was 30.41%. This is comparable to a study done in eight rural districts of Ethiopia with 25.1% non-adherence rate, 38.3% non-adherence rate in western India [21], 33% non-adherence in Mozambique [13], and 41.1% non-adherence rate reported by WHO [22]. However, our study reported relatively lower level of non-adherence compared to in a study done in Tigray (62.8%) [19]. This may be probably due to the reason that our sample was from urban public health institutions where traditional beliefs that influence adherence to medications are less.

Looking for factors associated with non-adherence, age, income, knowledge about hemoglobin status, knowledge about anemia and nutritional counseling were significant predictors for non-adherence to IFA supplementation. Pregnant women with in age group of 25-34 years and above 35 years had a 4.48 times and 4.16 times higher non adherence to iron folic supplementation compared to women aging 15-24 years old that is in agreement with a study done in North Western Zone of Tigray [19]. In contrast, a study done in mozampique reported that increasing maternal age increased the likelihood of having had a regular intake of tablets [13]. This might be due to the fact that our study used a cross sectional study including 15years old and above ages who have better access for education.

According to our study a pregnant women whose hemoglobin is not measured and who had no information about anemia had a high likely hood of non-adherence than those whose hemoglobin was not measured and had no information about anemia. Around one quarter (26%) of pregnant women had knowledge about anemia that is less compared to 68.5% who had satisfactory knowledge about iron and anemia in mozambique [20]. This may be due to the health care team, health care system and women educational background.

Limitation of study: this study was used cross-sectional study design which can't determine causality that means temporal sequence between exposure and disease can't be established. In addition, a self-report adherence is used that is not accurate as a pill count method.

Conclusions and Recommendations

The non-adherence rate of IFA supplementation among pregnant women attending antenatal care in public health institutions at Hosanna town was found to be 30.41% which is a significant amount. Factors contributing to non-adherence were increasing maternal age, not knowing hemoglobin status, not getting information about anemia

and nutrition counseling. Promoting the benefits of iron/folic supplementation, increasing the awareness of women about anemia and nutrition counseling through health education activities is vital for decreasing non adherence. Health care providers should be aware of non-adherence problem and its associated factors so as to design strategies for improving the condition.

Availability of data and materials

The data that support the findings of this study was available from the corresponding author upon reasonable request in the form of SPSS Version 20.

Authors' Contributions

BJB, and MS took part in planning the study, management quality of data, analyzes the data and writing the manuscript, participated in designing the study and writing the manuscript. Both authors read and approved the final manuscript.

Competing Interests

The authors declare that they have no competing interests.

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