Original article

Gender differences in household headship and level of awareness on anaemia among Ethiopian women: Evidences from a nationwide cross-sectional survey

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Abstract

Background: Information on gender difference in household headship in relation to awareness and practice related to anaemia is limited. This study has examined the issue under caption and provides evidence-based information for some program initiatives.

Methods: Data from 970 Ethiopian women of reproductive age was extracted from a large data set collected as part of a nation-wide micronutrient programmes surveillance to examine the association between gender difference in household-headship and anaemia awareness. Data were analysed in SPSS version 20.0 for Windows. Proportional differences on some selected variables were determined using χ^2 test, and a p-value less than 0.05 was considered statistically significant.

Results: Males were found to head more than two third of the households. Significantly lower number of respondents were less educated with just 140 (14.4%) having primary cycle education (grades 1-6th) (P=0.001). About half of the respondents (50.2%) were aware of anaemia, with at least two thirds of the respondents from male-headed households aware of its symptoms (p=0.004) and treatment (p=0.003), and the difference was significant. Fewer women received iron supplementation in female-headed households (28.6%) than male-headed households (71.4%), though the difference was not significant (p=0.9). Unexpectedly, significant number of respondents with low awareness was among those with primary education with some regional variations (p=0.001).

Conclusion: Anaemia awareness and treatment seeking behaviour was markedly lower in female-headed households than male-headed households which can be attributed to low levels of education. Thus, to narrow the observed gap, targeted education programs for women headed household is recommended. [*Ethiop. J. Health Dev.* 2018; 32(2):75-81]

Key words: Gender, education, anaemia, iron supplementation, women, Ethiopia

Introduction

Anaemia still remains a major public health problem worldwide affecting an estimated 3.5 billion people, with 110,000 annual maternal deaths attributable to iron deficiency anaemia (1). In Africa, at least 50% of pregnant women are anaemic suggesting that they are at greater risk of maternal and infant mortalities, including premature birth (2). Physical and cognitive losses due to iron deficiency anaemia can lead to loses of up to 4% in gross domestic product (GDP) per annum in developing countries, thereby hindering social and economic development (3).

In Ethiopia, previous studies including the demographic health surveys have demonstrated that anaemia is prevalent in 54% of pregnant women with some regional variations (4-5), which likely contributes to the high maternal morbidity and mortality rates (4). According to the World Health Organization, prevalence of anaemia exceeding 40% in any population group is indicative of severe public health problem (2). Therefore, the prevalence of anaemia among pregnant women in Ethiopia is suggestive of the serious health problem the country is facing (4).

The determinants for anaemia among Ethiopian women include dependency on a single staple crop resulting in shortage of minerals and vitamins, chronic inflammations such as TB and HIV (6-7), high incidence of parasitic infestations and malaria (8), and low serum Folate. In order to mitigate the health complications associated with anaemia, the government of Ethiopia advocates daily supplementation of elemental iron containing folic acid and nutrition counselling during the antenatal follow up and six months post partum (9).

While iron supplementation and nutrition counselling given to pregnant women are effective strategies in improving birth weight (10) and haemoglobin count (11-13), their effectiveness in the wider population remains problematic due to low compliance and irregular intake of the iron folic acid supplements (2, 14, 15). In addition to these factors, it is possible that the long-standing gender differences in the household hold ship in the country could also negatively affect the utilization of the ongoing prevention strategies. Such information however is unavailable or limited. It has recently been demonstrated that self declared female headed-households (FHH) tend to have less access to job opportunities and government services in most developing countries. This is definitely a concern for policy makers since FHH are on the increase and it appears to pose challenges in designing policies to improve the maternal health in most developing countries (16). Although evidence on differences in socioeconomic measure across gender based household headship types is becoming more widespread, information on gender difference in household headship in relation to awareness and practice related

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to anaemia is limited. Therefore this study has examined the association between gender across household groupings that are differentiated by gender household-headship and provide policy makers with evidence based information for planning and appropriate intervention strategies of anaemia..

Methods

***Study area and population*:** Data on gender in terms of household-headship, knowledge and practices related to anaemia, and iron supplementation were extracted from a large data set collected from 2005-2007 as part of the Micronutrient Programmes Surveillance in Ethiopia, conducted among reproductive age women. Details of the findings on anaemia, iron- deficiency anaemia (IDA) and folic acid deficiencies (FAD) are published elsewhere in 2009/10 (6, 17). Ethiopia has 9 regional states and 2 administrative regions representing four major ecological zones. Each region consists of several villages/*kebeles* consisting of health posts which are the smallest units of operation in the hierarchy of the Ministry of health. These are manned by female cadres called health extension workers and women supporting groups.

The data of 970 women of childbearing age, drawn from 270 clustered villages and with complete data on socio-demographic status, knowledge related to anaemia and other important health variables like haemoglobin levels were extracted and included in the analysis to examine the association between gender difference in household-headship and women's knowledge related to anaemia.

The inclusion criteria were being resident in the sampled area; having at least one preschool aged child enrolled for other micronutrient studies

***Survey*:** Nine teams of data collectors composed of health workers (HWs), medical technologists (MTs) and enumerators were recruited and trained. The HWs and MTs were responsible for administering the household questionnaire. The household questionnaire covered issues of knowledge and practices with respect to vitamin A, iodine and iron supplementation.

***Data quality*:** To maintain data quality, all data collectors and supervisors were trained for five days by the principal author. The tools used were pretested and adapted to the socio-cultural setting of the country through expert opinion. The final version of the questionnaire was translated into the three main local languages spoken in the country, namely Amharic, Oromiffa and Tigrigna. Experienced supervisors checked the questionnaires on the spot to ensure completion and accuracy. Incorrect, unacceptable, and doubtful responses were assessed again the same day and rectified. Every evening the survey team met to discuss the experience of the day and plan for the next day. The completed questionnaires and data records were entered into a database. Details of the study methodology including biological samples handlings are reported elsewhere (6, 16).

***Data analysis*:** Data were entered and analysed using Statistical Package for the Social Science (SPSS) version 20. Proportional difference on household headship and maternal awareness related to anaemia were determined using χ^2 test and a p-value less than 0.05 was considered statistically significant. The following definitions were employed in the manuscript: Adequate knowledge on symptoms of anaemia was considered when participants responded above the mean (> 2.5) to the five knowledge questions on symptoms which included paleness around gums, dizziness, chronic fatigue, anorexia and shortness of breath.

Adequate knowledge on signs of anaemia was considered when participants responded above the mean (> 2.5) to the five knowledge questions on symptoms which included paleness around gums, hypotension/dizziness, chronic fatigue, anorexia and shortness of breath when walking.

Adequate knowledge on causes of anaemia was considered when participants responded above the mean (> 2.5) to the five questions on causes of anaemia which were inadequate food intake, illnesses like malaria and HIV/AIDS, bleeding, heavy maternal chores and worm infestations.

Adequate knowledge on prevention of anaemia was considered when participants responded above the mean (> 2.0) to the four questions on prevention of anaemia that included eating adequate amounts of food, reducing physical work, treating worms and taking iron medications.

Adequate knowledge on treatment of anaemia was considered when both iron intake and blood transfusion were spelt out as the main ways of treating anaemia.

***Ethical approval*:** The Research and Ethical Committee of the Ethiopian Health and Nutrition Research Institute approved the study. All respondents gave informed verbal consent to participate in the study. All biological samples were collected aseptically and those subjects with intestinal worms were treated at the spot while those with anaemia were referred to the respective health institutions.

Results

***Demographic characteristics of the respondents and their households*:** Altogether, 970 women data with information on demographic characteristics, reproductive history, anaemia and haematological findings were disaggregated by gender and analysed. The number of male-headed households was significantly higher 690 (71.0%) than female-headed households 280 (29.0%) (p=0.001). In terms of education, among male-headed households, 260 women (26.8%) had completed their primary school education, while significantly lower number of women 140 (14.4%) in female-headed households had primary school education (Figure 1).

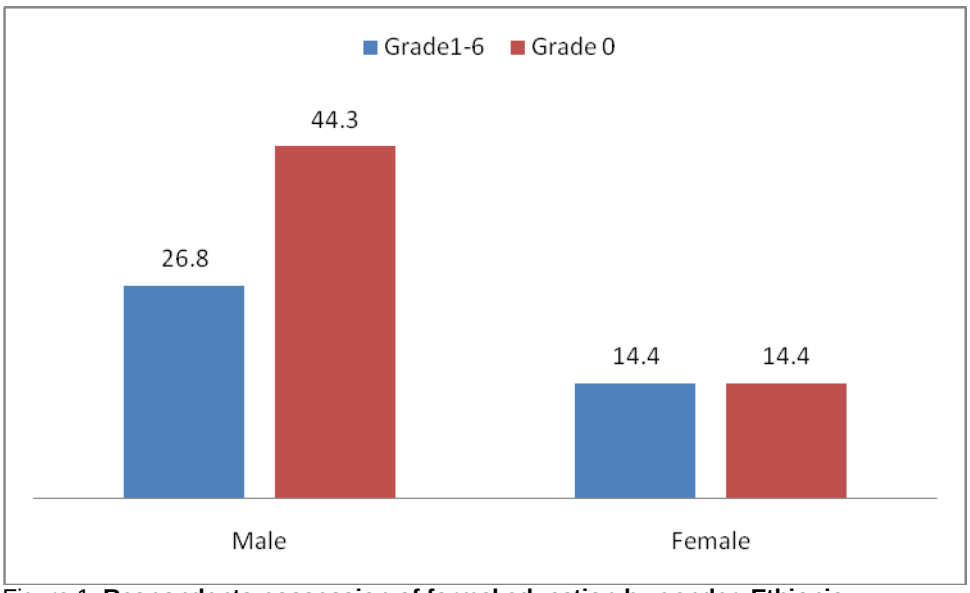

Figure 1: **Respondents possession of formal education by gender, Ethiopia**

The mean age was 35.6 (SD±9) years, and mean household sizes was 5.4 (SD±2.1) members, with some variation between males and female-headed households (Table 1).

Knowledge about anaemia and iron supplements: About half (50.2%) of the respondents had heard of anaemia. Among these, a larger proportion belonged to male-headed households than female-headed households, though the difference was not significant (p=0.3). Overall, the proportion of respondents who knew causes and signs of anaemia was not significantly different by household gender difference (p=0.3). Nonetheless, the proportion of male who knew symptoms (p=0.004) and treatment of anaemia such as medicinal iron intake and blood transfusion (p=0.003) was significantly higher than the female-headed households. The proportion of family planning utilization (p=0.9), post delivery vitamin A (p=0.9) and iron (p=0.7) supplementation in the last pregnancy, and delivery at health facilities (p=0.6) was 21.2%, 23.4%, 22.6% and 21.2%, respectively. Service utilization was higher in male than female headed households though the difference was not significant (Table 1).

Household-head gender and regional awareness of anaemia: When the level of anaemia awareness was examined by gender across the regions, almost all regions had heard of anaemia, and knew its causes, signs, symptoms and treatment including iron supplementation with some regional variations. Overall, the proportion in terms of symptoms and treatment awareness was significantly higher in males than females (p=0.004). However, when the awareness was disaggregated by regions, the proportion of females that had awareness was higher in *Tigray*, *Dire-Dawa*, *Addis Ababa*, *Harari* and *Oromia* regions with some variations. The difference however was only significant (p=0.04) for *Tigray* region. Contrary to the above, female proportion with awareness was lower in *Afar*, *Amhara* and *Benishengul-Gumuz* regions though the difference was not statistically significant (p=0.1). Interestingly, the proportion in terms of awareness was similar between males and females from the southern region.

Table 1: **Respondents characteristics by household head gender**

Characters	Household head Gender		Total N (%)	χ^2	p-value
	Male N(%)	Female N(%)			
In marital union					
Yes	641(80.4)	156(19.6)	797(82.2)	187	0.001
No	49(28.3)	124(71.7)	173(17.8)		
Household size (members)					
1-5	367(64.7)	200(35.3)	567(58.5)	27.2	0.001
>5	323(80.1)	80(19.9)	403(41.5)		
Mean (SD)	5.7(2.1)	4.7(1.9)	5.4(2.1)		
Age (years)					
15-25	30(31.6)	65(68.4)	95(9.8)	134	0.001
26-35	246(62.9)	145(37.1)	391(40.3)		
>35	414(85.5)	70(14.5)	484(49.9)		
Mean (SD)	36.5(8.8)	29.8(7.8)	34.6(9.0)		
Heard of anaemia (> mean)					
Yes	353(72.5)	134(27.5)	487(50.2)	0.8	0.3
No	337(69.8)	146(30.2)	483(49.8)		
Knew causes of anaemia (>mean)					
Yes	353(72.5)	134(27.5)	487(50.2)	0.8	0.3
No	337(69.8)	146(30.2)	483(49.8)		
Knew signs of anaemia (> mean)					
Yes	339(69.9)	146(30.1)	485(50.0)	0.7	0.3
No	351(72.4)	134(27.6)	485(50.0)		
Knew symptoms of anaemia (>mean)					
Yes	419(68.0)	197(32.04)	616(63.5)	7.9	0.004
No	271(76.6)	83(23.4)	354(36.5)		
Knew anaemia treatment (> mean)					
No	273(39.6)	83(29.6)	356(36.7)	8.4	0.003
Yes	417(60.4)	197(70.4)	614(63.3)		
Used family planning					
No	543(78.7)	221(78.9)	764(78.8)	0.01	0.9
Yes	147(21.3)	59(21.1)	206(21.2)		
Received Vitamin a post delivery					
No	529(71.2)	214(28.8)	743(76.7)	0.01	0.9
Yes	161(70.9)	66(29.1)	227(23.4)		
Supplemented iron last pregn.					
No	536(71.4)	215(28.6)	751(77.4)	0.09	0.7
Yes	154(70.3)	65(29.7)	219(22.6)		
Delivery assisted					
Yes	546(71.5)	218(28.5)	764(78.8)	0.2	0.6
No	144(69.9)	62(30.1)	206(21.2)		

Pregn. = during last pregnancy

Table 2: A**naemia related and supplementation information respondents by gender and region,**

Studied regions	Gender	% Heard anaemia	% Knew Causes	% Knew Signs	% Knew Symptoms	% Knew treatment	% iron supplemented
Tigrai	Male	22(29.3)	22(29.3)	22(29.3)	28(30.8)	28(31.1)	10(22.2)
	Female	53(70.7)*	53(70.7)*	53(70.7)*	63(69.2)*	62(68.9)*	17(21.3)
Afar	Male	34(66.7)	34(66.7)	34(66.7)	35(67.3)	35(67.3)	6(14.6)
	Female	17(33.3)	17(33.3)	17(33.3)	17(32.7)	17(32.7)	1(5.9)
Amhara	Male	70(93.3)	70(93.3)	70(93.3)	74(93.7)	74(93.7)	41(50.0)
	Female	5(6.7)	5(6.7)	5(6.7)	5(6.7)	5(6.7)	3(50.0)
Oromiya	Male	28(31.8)	28(31.8)	28(31.8)	43(48.9)	43(48.9)	26(29.5)
	Female	6(54.5)	6(54.5)	6(54.5)	6(54.5)	6(54.5)	1(9.1)
SNNP	Male	44(37.0)	44(37.0)	44(37.0)	57(47.9)	58(48.7)	16(13.4)
	Female	44(37.6)	44(37.6)	44(37.6)	57(47.9)	58(48.7)	16(13.4)
Benshengul-	Male	60(56.6)	60(56.6)	60(56.6)	63(59.4)	63(59.4)	21(19.8)
Gumuz	Female	10(83.3)	10(83.3)	10(83.3)	10(83.3)	10(83.3)	1(8.3)
Harari	Male	44(36.7)	44(36.7)	44(36.7)	70(58.3)	69(57.5)	21(17.5)
	Female	6(40.0)	6(40.0)	6(40.0)	10(66.7)	11(73.3)	3(20.0)
Addis Ababa	Male	5(14.7)	5(14.7)	5(14.7)	12(16.4)	11(15.3)	5(21.7)
	Female	29(85.3)	29(85.3)	29(85.3)	61(83.6)	61(84.7)	36(35.0)
Dire-Dawa	Male	30(45.5)	30(45.5)	30(45.5)	37(56.1)	36(54.5)	8(12.1)
	Female	20(55.6)	20(55.6)	20(55.6)	25(69.4)	25(69.4)	3(8.3)
Overall	Male	337(69.8)	337(69.8)	339(69.9)	419(68.0)*	417(67.9)*	154(70.3)
	Female	146(30.2)	146(30.2)	146(30.1)	197(32.0)	197(32.1)	65(29.7)

*p=0.004

***Household-head education and regional awareness of anaemia*:** Table 3 shows the level of anaemia awareness by possession of primary cycle education by regions. The proportion of respondents who heard of anaemia, knew its causes, signs and treatment including iron supplementation were significantly higher among those households who had no primary education than those who did in all 9 regions (p=0.001). On the other hand, in terms of anaemia symptom awareness, the findings were not consistent. Awareness was significantly higher among those households who had primary education from *Tigray* (p=0.001), *Afar* (p=0.001), *Oromia* (p=0.001), *SNNP*(p=0.001), *Benishengul-Gumuz* (p=0.001), *Harari* (p=0.001), *Addis Ababa* (p=0.001) while the reverse was true in *Amhara* (p=0.001) and *Dire Dawa* (p=0.001) regions.

Table 3: **Awareness on anaemia related information and supplementation of respondents by possession of primary cycle education and regions, Ethiopia**

Surveyed Regions	% had primary Education	% Heard Anamia*	% Knew Causes*	% Knew Signs*	% Knew Symptoms*	% Knew Treatment	%Iron Supplemented
Tigrai	None	40(80.0)*	26(76.5)*	27(77.1)*	32(32.7)	40(80.0)*	40(80.0)*
	Educated	9(12.0)	23(25.3)	22(24.4)	17(63.0)*	9(12.0)	9(12.0)
Afar	None	4(57.1)*	3(50.0)*	3(50.0)*	5(9.8)	4(57.1)*	4(57.1)*
	Educated	2(3.9)	3(5.8)	3(5.8)	1(14.3)*	2(3.9)	2(3.9)
Amhara	None	6(46.2)*	4(44.4)*	4(44.4)*	8(18.2)*	6(46.2)*	6(46.2)*
	Educated	3(4.0)	5(6.3)	5(6.3)	1(2.3)	3(4.0)	3(4.0)
Oromiya	None	50(76.9)*	38(76.0)*	38(76.0)*	34(47.2)	50(76.9)*	50(76.9)*
	Educated	4(11.8)	16(32.7)	16(32.7)	20(74.1)*	4(11.8)	4(11.8)
SNNPR	None	36(48.0)*	29(46.8)*	28(45.9)*	35(34.0)*	36(48.0)*	36(48.0)*
	Educated	8(18.2)	15(26.3)	16(27.6)	9(56.2)*	8(18.2)	8(18.2)
Benishengul-Gumuz	None	22(45.8)*	20(44.4)*	20(44.4)*	20(20.8)	22(45.8)*	22(45.8)*
	Educated	7(10.0)	9(12.3)	9(12.3)	9(40.9)*	7(10.0)	7(10.0)
Harari	None	63(74.1)*	37(67.3)*	36(65.5)*	51(45.9)	63(75.0)*	63(74.1)*
	Educated	4(8.0)	30(37.5)	31(38.8)	16(66.7)*	4(7.8)	4(8.0)
Addis Ababa	None	88(95.7)*	52(98.1)*	53(98.1)*	60(70.6)	87(95.6)*	88(95.7)*
	Educated	5(14.7)	41(56.2)	40(55.6)	33(80.5)*	6(17.1)	5(14.7)
Dire-Dawa	None	38(73.1)*	28(70.0)*	29(70.7)*	45(49.5)*	38(73.1)*	38(73.1)*
	Educated	11(22.0)	21(33.9)	20(32.8)	4(36.4)	11(22.0)	11(22.0)
Overall	None	347(71.3)*	237(66.9)*	238(66.9)*	290(38.6)	346(71.3)*	347(71.3)*
	Educated	53(11.0)	163(26.5)	162(26.4)	110(50.2)*	54(11.1)	53(11.0)

*(p=001)

Discussion

Anaemia in Ethiopia, as in most developing countries, is a public health problem affecting over half of pregnant women (4). To mitigate the problem, the Federal Ministry of Health advocates daily supplementation of elemental iron containing folic acid, nutrition counselling including treatment of parasitic infections such as malaria, hookworms

during the antenatal follow up and advocacy work through public radio and posters containing the appropriate messages on anemia control and preventions among others (9). While the above strategies are widely documented elsewhere, this study in particular has examined gender differences in household headship and awareness of anaemia in light with the revised national nutrition program (18) which underscores the importance of gender in its growth and transformation plan.

The present study provides information on gender difference and awareness on anaemia, which is first of its kind, using the large sample-size with good response rate (90%). However, there is still the possibility of biases because of the nature of cross sectional studies which is affected by memory lapses. Overall, the number of male-headed household was significantly higher than female headed households (71.% vs. 29.0%) and significantly higher number of male-headed populations had primary cycle education than female-headed ones (26.8 vs. 14.4%) and were in marital union (80.4% vs. 19.6%) suggesting some gender differences which require some remedial adjustments such as education that addresses the women headed households.

Awareness is an important step that is expected to influence change, though not all knowledge leads to appropriate behavioural changes. In this study, the levels of knowledge of anaemia in terms of awareness, its causes, signs, symptoms and treatment were about 50% with higher number of awareness from male than female-headed households. In addition, only one in four of the respondents used family planning services, took iron supplements in the last pregnancy, delivered at health facilities and received post delivery vitamin A with better service utilization among male than female headed households, though the difference was not significant. This should be of major concern to policy makers and stakeholders, prompting the need to find ways of increasing ANC attendance, and intake of iron supplements throughout pregnancy based on the WHO recommendations (2). Compared to neighbouring Kenya, iron supplementation figures are slightly lower (24.5 vs. 22.6%) (19), which could be attributed to the socioeconomic differences of the studied populations. Other studied variables were not compared with other studies because of shortage of related work.

The efforts made prior to the survey to increase awareness on anaemia and related reproductive health services in reaching out the rural women should not be overlooked since it had showed some improvements with regards to facility based deliveries which have increased from 10% in 2011 to 26% in 2016(20). While some of the results are encouraging to policy makers and stakeholders, more effort is needed to achieve high levels of awareness through the women development army initiatives and community development meetings conducted by health and agriculture extension workers (19). Increasing knowledge alone would not be enough unless accompanied with ways of ensuring that pregnant women adopt healthful practices. These include iron supplementation and other reproductive health service packages that could reduce anaemia and prevent increased risk of maternal morbidity and mortality including, premature birth, infant death (2, 3). In the absence of positive behavioural change such as intake of iron supplements during pregnancy, increased awareness on anaemia is likely to have little or no impact in reducing the prevalence of anaemia in this most at risk population.

One of the interesting finding of this study was the fact that the overall awareness (anaemia symptoms and treatment) was significantly higher in males than females. Nonetheless, when awareness was disaggregated across the regions, the number of females and males with awareness were equal in the southern region of the country, suggesting that the strategy used in the south could be more effective. This therefore needs to be investigated and documented to incorporate the best practices or lessons learned for the wider population in the country.

It is evident the risk of developing anaemia during pregnancy is high in Ethiopia and requires strategies which can confer high compliance, and are effective in reducing the high prevalence of anaemia in this population. While educating pregnant women should be an ongoing intervention to increase awareness and improve compliance with supplementation, there is a need to scale up other complementary strategies like fortification, dietary diversification, and infection reductions. Other opportunities evidenced from this study as well as some previous studies (21-22) is to include household-heads and close family members during nutrition counselling process because they influence health-seeking behaviours of women
.
The study has also examined the association between education and awareness of anaemia across the regions. Unexpectedly, awareness was significantly higher in households with no primary education than those who had primary cycle education with some regional variations. This assertion however needs to be interpreted cautiously since education in most instances appears to lead to better awareness.

Conclusion

Male-headed households had higher awareness on anaemia than female-headed households, with some regional variations, presumably because of their better level of education. There is a need for the Federal Ministry of Health and stakeholders to continue educating women on anaemia and its consequences. Such education may be accompanied by ensuring pregnant women adopt healthful practices like iron supplementation and utilizing health services. The women development army which is close to the community may play role in improving the nutritional state of women of reproductive age.

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