

Magnitude of Anemia and Socio Demographic Factors Associated with it among Adults Age 15-49 Years in Ethiopia: A Population Based Study using the 2016 Demographic and Health Survey Data

Kaleab Tesfaye Tegegne^{1*} Abiyu Ayalew Assefa¹, Eleni Tesfaye Tegegne² and Mekibib Kassa Tessema³

¹Department of Public Health, Hawassa College of health science, Hawassa, Ethiopia

²Department of Public Health, School of Nursing College of Medicine and Health Science, University of Gondar, Gondar, Ethiopia

³Department of Public Health, Leishmania Research and Treatment Center, University of Gondar, Gondar, Ethiopia

Abstract

Background: According to World Health Organization (WHO); anemia considered as a major public threat when prevalence was greater than 40%, a moderate public threat from 20-40%, and as a mild threat from 5-20%. This study aims to assess the prevalence of anemia and its associated socio demographic factors among adults age 15-49 years in Ethiopia.

Methods: Demographic and Health Surveys in 2016, in Ethiopia were analyzed in SPSS, using multivariate logistic regression. Socio demographic variables were selected based on their availability in the dataset.

Results: The total sample of 27289 of men and women 15-49 years at the time of survey, 19.8 % (n=5078) anemia. Men and women 15-49 years living in rural areas 0.029 (AOR 0.029 ; 95% CI:0.018--0.048), men and women age living in afar region 0.821 (AOR 0.821; 95% CI: 0.725--0.929), men and women who are in lowest wealth quintile 1.255 (AOR 1.255; 95% CI: 1.091-1.445) and an increase in one-year in age 9.952 (95% CI 6.2 to 16.1) were found significant predictors of anemia.

Conclusion: The magnitude of anemia in the current study was found to be a mild public health problem. Rural residence, low wealth quartile and old age were predictors of anemia among adults Age 15-49 years. There is significant urban-rural difference in anemia prevalence, indicating the need for targeting specific areas for intervention.

Keywords: Anemia; EDHS; Socio demographic; Ethiopia

***Corresponding author:** Kaleab Tesfaye Tegegne, Department of Public Health, Hawassa College of health science, Hawassa, Ethiopia, E-mail: kaleabtesfaye35@gmail.com

Citation: Tegegne KT, Assefa AA, Tegegne ET, Tessema MK (2021) Magnitude of Anemia and Socio Demographic Factors Associated with it among Adults Age 15-49 Years in Ethiopia: A Population Based Study using the 2016 Demographic and Health Survey Data. J Health Reprod Contracept Vol. 6 No.1.

Received: February 05, 2021; **Accepted date:** February 20, 2021; **Published date:** February 27, 2021

Background

Anemia is defined as a condition in which there is less than the normal hemoglobin level in the body, which decreases oxygen-carrying capacity of red blood cells to tissues. Anemia is more common in developing countries because of poor nutritional status and high prevalence of parasitic infestation [1].

According to World Health Organization (WHO); anemia considered as a major public threat when prevalence was greater than 40%, as a moderate public threat when prevalence was from 20-40%, and as a mild threat when prevalence was from 5-20% [2]. Globally, anemia affects over a quarter of the world population [3,4]. The highest prevalence of anemia exists in the developing world its causes are multifactorial. Anemia is responsible for significant morbidity and mortality [5,6].

A study in Uganda reported a prevalence of 16.8% to 33.8% anemia in adult men and women [7]. Another study also reported anemia, 12.5% in males and 13.2% in

females in South Africa [8] and 23% prevalence in Zimbabwe [9]. A study from Ghana reported a 53.2% prevalence of anemia in non-pregnant women [10]. Similar studies have been reported in Ethiopia, with 17 to 52.3% prevalence of anemia [11]. In addition, data from WHO indicated that prevalence of anemia among non-pregnant women in Ethiopia was 23.3% as of 2016. Its highest value over the past 26 years was 47.50% in 1990, while its lowest value was 21.40% in 2012. Prevention and control of anemia is important to reduce its consequences. The magnitude of the different types of anemia and its severity have not yet well documented in Ethiopia. Therefore, additional studies on anemia are required to produce national data.

The majority of researches regarding anemia has been focused on children, adolescents and pregnant women and almost all of them are institution based studies. However, assessing anemia among apparently healthy adults through community-based studies is essential. Therefore, the aim of this study was to assess the prevalence of anemia and its associated factors among adults age 15-49 years in Ethiopia.

Methods

Data source, sampling and data collection

The data for this study was extracted from the 2016 EDHS. The 2016 EDHS is the fourth and most recent in the Demographic and Health Survey series in Ethiopia. The survey was conducted in nine regional states and two city administrations of Ethiopia. Further details on sampling strategy can be found in the DHS manual.

A total of 16,583 eligible women and 11,606 eligible men between 15 and 49 years were approached to be interviewed. A response rate of 95% was observed with 15,683 women completing the interviews and response rate 86% among 11,606 men interviewed. The interviews included several standard questionnaires recording information ranging from basic socio-demographic information to detailed bio-medical information. Our analysis included all men and women age 15-49 years which resulted in a total weighted sample of 27,289

Outcome variable

We used any Anemia as the outcome variable using the recommended definition as Anemia status by hemoglobin level for women 15-49 years age Not pregnant <12.0 g/dl Pregnant <11.0 g/dl and for men 15-49 years age <13.0 g/dl (1 if the people have anemia 0 otherwise).

Statistical analysis

Sampling weights provided with the EDHS dataset were used during analysis. Further details on sample weights can be found in the EDHS report.

Descriptive statistics were employed to show the distribution of background characteristics. We used logistic regression model to determine the true association between anemia and basic socio-demographic factors. Both unadjusted and adjusted odds ratios

(ORs) were reported with 95% confidence intervals (95% CI). Besides, diagnostic tests were done, particularly goodness of fit of the model by the Hosmer and Lemeshow test; (where p-value of 1.00 was found), The Cronbach's alpha result of the variables is .889. The Nagelkerke R Square shows that about 70.6% of the variation in the outcome variable (Anemia) is explained by this logistic model. The overall accuracy of this model to predict subjects having Anemia (with a predicted probability of 0.5 or greater) is 88.4%. All analyses were performed using Statistical Software SPSS.

Results

Baseline characteristics

The total sample of 27,289 of men and women 15-49 years at the time of survey, 19.8% (n=5078) have anemia (Table 1). As summarized in Table 1, majority (57.5%) of the respondents were female and a predominant percentage of the men and women 15-49 years lived in rural areas (78.8%), respondents in the regions of Oromiya were (37.1%) and Amhara (24.3%). 32.1% of men and women 15-49 years reported not working in the past 12 months at the time of survey, and 39.2% did not have any formal education. In addition to education status, around 45.9% of men and women 15-49 years reported having poor literacy skills and could not read at all.

Socio-demographic factors	N(%)
SEX	LVOT PG
Male	11606(42.5%)
Female	15683(57.5%)
Wealth index	LVOT PG
Lowest	4472(16.4%)
Second	4927(18.1%)
Middle	5224(19.1%)
Fourth	5566(20.4%)
Highest	7098(26.0%)
Residence	LVOT PG
Urban	5779(21.2%)
Rural	21509(78.8%)
Age category	
15-19	5953 (21.8%)
20-24	4645 (17.0%)
25-29	4934 (18.1%)
30-34	3980(14.6%)
35-39	3318(12.2%)
40-44	2496(9.1%)
45-49	1961(7.2%)
Religion	
Orthodox	11946(43.8%)
working status (past 12 months)	
Working	18518(67.9%)

Table 1: Specific dimensions given in echocardiography.

Majorities (39.8%) of the respondent's occupation were agriculture, 28.1% were non agriculture employee in addition, and 43.8% of the respondents were orthodox religion followers.

In terms of men and women 15- 49 years age, overall 21.8% of men and women were between 15 and 19 years of age.

Most men and women 15- 49 years (58.9%) reported as currently married at the time of the survey. Of the total, only 16.4% were in lowest wealth quintile and 26.0 % were in the highest wealth quintile. In terms of the number of living children , about 39.7 % of men and women 15- 49 years reported to have one living children and 20.7% had more than 5 number of living children during survey. Regarding exposure to mass media, 6.2% read newsletter, 18.1% watch to TV and 21.7% listen to radio.

Discussion

Globally, anaemia affects 1.62 billion people which correspond to 24.8% of the population prevalence in men (12.7%) (34) The prevalence of anemia was 27.4%. A recent study by Umeta also documented a comparable prevalence of 30.4%. This figure is higher than the 2002 estimate of UNICEF (17.4%) and what has been documented by Hayder (18.4%). The overall prevalence of anemia was 40.9%. Study done in Egypt (39%).

The findings over the decade did not witness tangible progress in the reduction of anemia in Ethiopia. However, the magnitude found in the current study was higher than in studies conducted, at Hawassa Referral Hospital (12.0%), Jimma University Hospital (16.2%), and Ras Desta Damtew Memorial Hospital (2.85%) and in Malawi (16.2%) the findings from The People's Republic of China (13.4%),(45) Serbia (7.7%), and Korea (8.4%). Variations in the methods employed, and a larger proportion of nationally representative data, are more likely to account for the differences between these estimates.

The differences in the magnitude of anemia may be explained by differences in the study time, study area.

Demographically, since age is a quantitative numerical variable, an increase in one-year in age has 9.952 (95% CI 6.2 to 16.1) times decrease in odds of having Anemia.

Studies in Ethiopia and Tanzania reported higher prevalence in older age groups, studies in Tanzania Nigeria and India failed to witness any association. As expected, men and women 15-49 years who are in lowest wealth quintile had 25 % (AOR 1.255; 95% CI: 1.091-1.445) higher odds of having anemia.

Anemia prevalence was 20.1% among urban and 46.6% among rural residents. This observed, high prevalence of anemia among urban residents was similar to the finding from the Ethiopian demographic and health survey 2011, 31% for rural and 16% for, urban. However, this, finding was inconsistent with a study done in central and eastern China, where the, finding was almost the same, 13.6% in urban and 13.3%, in rural areas. The possible reasons might be due to low socioeconomic status, low serving of iron-rich, foods, lack of adequate nutrition information and, a high number of illiterates in urban areas as compared, to rural in this study.

Conclusion

The magnitude of anemia in the current study was found to be a mild public health problem. Rural residence, low wealth quartile and old age were predictors of anemia among adults Age 15-49 years. There is significant urban-rural difference in anemia prevalence, indicating the need for targeting specific areas for intervention. Therefore, it is recommended that educational empowerment, nutrition education and nutrition service have a positive contribution in combating anemia in Ethiopia, especially in Urban areas.

Acknowledgements

We are grateful to Measure DHS, ICF International Rockville, Maryland, USA for providing the 2016 EDHS data for this analysis.

Availability of data and materials

The survey datasets used in this study was based on publicly available dataset that is freely available online with no participant's identity from <http://www.dhsprogram.com/data/available-datasets.cfm>. Approval was sought from MEASURE DHS/ICF International and permission was granted for this use.

Ethics approval and consent to participate

This study is a secondary data analysis of the EDHS, which is publicly available, approval was sought from MEASURE DHS/ICF International and permission was granted for this use. The original DHS data were collected in conformity with international and national ethical guidelines. Ethical clearance was provided by the Ethiopian Public Health Institute (EPHI) (formerly the Ethiopian Health and Nutrition Research Institute (EHNRI)

Review Board, the National Research Ethics Review Committee (NRERC) at the Ministry of Science and Technology, the Institutional Review Board of ICF International, and the United States Centers for Disease Control and Prevention (CDC). Written consent was obtained from respondents and data were recorded anonymously at the time of data collection during the EDHS 2016.

Author's contributions

AAA, KTT, ETT, and MKT were involved in formatting the research question. KTT performed the analysis with assistance from AAA, ETT and MKT. All authors prepared the initial draft of the manuscript. ETT and KTT critically revised the manuscript for intellectual content. All authors approved the final version of the manuscript.

References

1. Allen LH.(2000) Anemia and iron deficiency: effects on pregnancy outcome. *Am J Clin Nutr.* 2000 May 1;71(5):1280S-1284S.
2. Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, et al. (2013) AHA statistical update. *Circulation* 127.
3. McLean E, Cogswell M, Eglfi I, Wojdyla D, De Benoist B. (2009) World wide prevalence of anaemia, WHO vitamin and mineral nutrition information system, 1993–2005. *Public Health Nutr.*;12(4):444-454.

4. Pasricha SR. (2014) Anemia: a comprehensive global. *Blood*. 123(5): 611–612.
5. Tolentino K, Friedman JF. (2007) An update on anemia in less developed countries. *Am J Trop Med Hyg*. 77(1):44–51.
6. Prasanth R. (2017) Prevalence of anemia in both developing and developed countries around the world. *World J Anemia*.1(2):40-43.
7. Mugisha JO, Bafisley K, Asfiki G, Seeley J, Kuper H. (2013) Prevalence, risk factors and clinical correlates of Anaemia in older people in a rural Ugandan population. *PLoS One*. 8:10.
8. Oldewage-Theron WH, Samuel F, Grobler C, Egal A. (2008) prevalence and dietary intake of elderly persons living in a peri-urban settlement in South Africa. *Journal of Family Ecology and Consumer Sciences*. 36:22-29.
9. Allafin TJ, Gomo Z, Wifison AO, Ndemera B, Adamchak DJ, et al. (1997) Anaemia, macrocytosis, vitamin B¹² and folate levels in elderly Zimbabweans. *Cent Afr J Med*. 43:325-7.
10. Samuel TCK, Agbolfo E, Hoffman H, Walana W. (2013) Malaria and in pregnant and non-pregnant women of child-bearing age at the university hospital, Kumasi, Ghana. *Open J Med Microbiology*. 3:3.
11. WHO/CDC. (2008.) *Worldwide Prevalence of Anemia*. Switzerland: Global Database on Anemia, World Health Organization, Geneva;
12. Central Statistical Agency and ICF Macro, Ethiopia Demographic and Health Survey Preliminary Report, Central Statistical Agency, Addis Ababa, Ethiopia; ICF Macro, Calverton, Md, USA.