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ANEMIA --A MAJOR HEALTH CHALLENGE FOR WOMEN AND CHILDREN

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ABSTRACT

Anemia in women of reproductive age is a severe public health problem for low- and middle-income nations, and it has a long-term harmful affect not only on the health of women, but also on the health of their children and the economic success of the society as a whole. In addition, anemia is a leading cause of death among women of reproductive age in developing countries. In spite of the fact that the World Health Organization has established a target for a global decline in the prevalence of anemia among women of reproductive age of fifty percent by the year 2025, it is extremely unlikely that this goal would be attained given the current trend. Anemia, which may be brought on by a lack of iron in the diet, is one of the most major problems impacting public health in developing countries, especially among women of reproductive age. Iron storage in women of reproductive age can be influenced by a wide range of circumstances, such as age, the number of children they have birthed, their financial position, and the foods they eat. The existence of anemia can lead to a range of undesirable consequences, the majority of which can be prevented if the essential therapeutic and preventative therapy is received in a timely manner. Anemia is one of the most frequent diseases, and one of the most common causes of anemia is deficiency of iron, the others being lack of folic acid and Vitamin B12. This condition is more prevalent in less developed countries. The health care systems of these nations, which are already struggling owing to a lack of resources, are subjected to an additional burden as a result of this. Women and children make up the population at high risk, although for physiological reasons, the danger is much higher in women. The population at high risk includes both groups. The presence of a variety of risk factors increases the likelihood of developing anemia, which in turn increases the likelihood of developing a number of adverse outcomes.

Keyword-*Iron deficiency, Women, Reproductive age, hemoglobin, erythroblast, heme-iron.*

INTRODUCTION

Iron is one of the minerals that our body needs in order to be able to carry out some of the actions that are necessary. Our body cannot function properly without iron. Without iron, our body simply will not be able to operate correctly. Iron, which is a component of hemoglobin, is responsible for the critical and crucial task of transporting oxygen from our lungs to the cells in our bodies. Iron is an element that is vital for the healthy functioning of the human body, hence it is required by the body. According to the Centers for Disease Control and Prevention (CDC), "Iron deficiency" is a condition that develops when there is not enough iron available in the body. This can cause a variety of health issues. This explanation of what "iron deficiency" means is an

accurate summary of the condition. Erythroblasts, the cells that are responsible for the production of hemoglobin, require iron in order to carry out their functions correctly, which is why iron is such an important component. If there is not enough iron in the diet, the manufacturing of hemoglobin will fail, which will lead to a reduction in the quantity of red blood cells. There will be a drop in the total number of red blood cells if an individual's diet does not contain an adequate amount of iron. A medical illness that is often referred to as "Nis" is more commonly known as "Anemia." It is possible to determine whether or not a person has anemia by determining whether or not their hemoglobin level is lower than the normal or recommended level. The World Health Organization (WHO) recommends that non-pregnant women (age 15 and up) should have a hemoglobin level of 120 gm/l, while males (age 15 and up) should have a hemoglobin level of 130 gm/l. These recommendations are based on the fact that women tend to have lower hemoglobin levels than men. The observation that women often have lower hemoglobin levels than males serve as the rationale behind these suggestions.

In addition, there are three unique types of iron insufficiency, which may be distinguished from one another in the following ways:

- A person with moderate iron shortage has normal hemoglobin and iron-dependent protein synthesis but depleted iron stores.
- A person with marginal iron insufficiency has normal Hb concentrations but depleted iron reserves and a decrease in the creation of iron-dependent proteins.
- Iron deficiency anemia is defined by a lower-than-normal concentration of circulating red blood cells (RBCs), which in turn leads to a lower-than-normal concentration of hemoglobin (Hb) inside blood cells, which in turn leads to impaired oxygen delivery to tissues. Both of these effects are caused by a lower-than-normal concentration of circulating red blood cells (RBCs), which in turn leads to impaired oxygen delivery to tissues. In addition to this, iron reserves become even more depleted, and the quantities of iron-dependent oxidative enzymes drop in the body.

In recent years, anemia has emerged as a significant problem for the general population's health. According to N. Millman (2014), "The most common nutrition deficiency in both developing and developed countries is iron deficiency." Iron deficiency is more widespread in developing countries.

In the world's most impoverished nations, pregnant women and children are the population groups that suffer from the highest rates of anemia and have the least access to medical care and other preventative measures. According to a study that was conducted by the World Bank on the subject of anemia, "the prevalence of anemia decreases with income in every region/country." In many nations, the prevalence is twice as high in the poorest people as it is in the richest people. An iron deficiency anemia was found to be the most frequent kind of anemia, according to the findings of a study that was conducted in Abbottabad. This form of anemia affects 68% of individuals and is more prevalent in girls than in males. According to the data, iron deficiency is more prevalent in poor nations than it is in industrialized ones, despite the fact that iron deficiency is widespread among women in both types of countries. In underdeveloped nations, several causes and effects of anemia have been recorded in the literature, but these are not compiled in one location for easy access and analysis. This literature review was conducted with the intention of reviewing and synthesizing the findings

from previous research on the burden, causes, and effects of anemia in developing countries as well as the most essential strategies for treating the condition.

The World Health Organization (WHO) considers anemia to be a hazard for public health if the prevalence of the condition is more than 5%; nevertheless, the majority of the research referenced above found that the prevalence of anemia among women of reproductive age is over 20%. In addition, the World Health Organization (WHO) has established a global aim of reaching a decrease of 50% in the prevalence of anemia in women of reproductive age by the year 2025, even though it is doubtful that this plan would be achieved given the present trend. As a result, the purpose of this study was to determine the prevalence of anemia in women of reproductive age and the characteristics related with it. In this study, we tested the hypothesis that there is a high incidence of anemia in women of reproductive age in eastern Africa and that there are a variety of variables related with the development of anemia. The findings of this study will be beneficial in informing policymakers and program planners, which will allow them to make better decisions and develop suitable intervention methods to combat this critical public health concern and achieve the goal outlined by the WHO.

The reasons behind an iron deficit

There are two primary factors that might be responsible for iron deficiency. Both factors, higher iron requirements and reduced iron intake and absorption, play a role in this condition.

There are a number of potential causes for increased iron requirements. These include an increased demand placed on the body as a natural consequence of development, blood loss, worms, pregnancy, infections, inflammatory bowel disease or donations. Anemia is also more likely to occur in women who have gynecological disorders or who have significant blood loss during their menstrual cycles. This puts these women at an even higher risk. There is a correlation between anemia and hereditary conditions such as thalassemia and sickle cell disease, both of which are made worse by the existence of anemia.

Anemia can also be caused by a number of other conditions, including chronic kidney disease, rheumatoid arthritis, TB, and bone marrow illnesses that inhibit the production of red blood cells. When a woman is pregnant, her body requires an additional 700–850 mg of iron on a daily basis, and when she starts breastfeeding, she loses even more iron than she did before because of the breast milk she produces. But the absence of menstruation during breastfeeding makes up for this loss.

As a result of numerous pregnancies, a woman's bodily iron levels will get reduced, which might lead to an increased risk. It has been shown that the number of children born in a certain sequence is connected with the severity of anemia in preschool-aged children. This finding suggests that mothers' iron reserves get gradually depleted after having several children. A decrease in absorption might be the result of the side effects of some drugs, which inhibit the body's ability to absorb iron from food. One such potential is a decreased consumption of iron-containing foods and beverages. The daily intake of iron from food in affluent nations is between 10 and 15 milligrams on average. Only between 1 and 3 milligrams per day, or between 5 and 10 percent of this quantity, is absorbed when conditions are normal.

It has been shown that big families, particularly those in which the women have lower levels of education, have a higher prevalence of anemia. Beliefs held within a culture have a significant bearing on the phenomenon as well. Iron-rich foods are avoided by members of certain cultural groups, which accounts for

a sizeable fraction of the total population of the globe. Another condition that might contribute to iron deficiency is being overweight or obese. In studies conducted in nations that are undergoing transition, researchers found that obesity was associated with a lower rate of iron absorption from the diet, which increased the risk of iron deficiency. Studies that take a cross-sectional approach in industrialized nations have indicated that persons who are overweight have an increased risk of iron insufficiency.

Malnutrition and an inadequate intake of food are the most prominent factors contributing to anemia in impoverished nations. The majority of women in both developing and industrialized nations consume a diet that is deficient in 'heme-iron' while also consuming an appropriate amount of non-'heme-iron' which has a poor absorption rate.

Signs and symptoms of anemia

- Fatigue.
- Weakness.
- Pale or yellowish skin.
- Irregular heartbeats.
- Shortness of breath.
- Dizziness or lightheadedness.
- Chest pain.
- Cold hands and feet.

Anemia in children less than 5 years of age

Both Nepal and Pakistan found that a child's age as well as whether or not they were stunted was connected with a higher chance of developing anemia. This is in line with the findings of a recent survey that was performed in Bangladesh that was representative of the entire country. The risk of developing anemia was highest for newborns in Nepal who were between 0 and 5 months old. In a similar vein, in Bangladesh, children who were between 6 and 23 months old had a greater risk for anemia in comparison to children who were between 24 and 59 months old. Children between the ages of 12 and 23 months in Pakistan had the greatest incidence of anemia (72.5%) compared to children between the ages of 36 and 59 months (50.4%). This is in line with the findings of a research that was carried out on children aged 12 to 23 months old in two rural regions of India.

In the context of the 1,000 Days programming, which has recently become the focus of many governments and sponsors, this conclusion is extremely significant. When it comes to a mother's health and nutrition, as well as a child's future growth and development, the time period beginning at the moment of conception and continuing until the child's second birthday is of the utmost importance. When a woman has anemia, her child is more likely to be born with the condition as well. It is imperative that this fact be acknowledged. This suggests that a significant amount of policy attention should be focused on resolving anemia in pregnant and

lactating mothers, as well as in infants and young children. This should take place in the context of introducing appropriate iron-rich complementary foods at the age of 6 months, as well as optimizing other infant and young child feeding practices.

It also implies that efforts to combat anemia should be prioritized as part of larger measures that aim to improve the growth of children. Another objective set for 2025 be Word Health Organisation is to reduce the prevalence of stunting in children, which has become a policy concern for both the international community and many national governments. Strong advocacy for this may be seen, for example, in the popular Scaling up Nutrition movement and the Stop Stunting project that is focused on South Asia. Both of these initiatives are centered on the region. In Bangladesh, children who are stunted have been proven to have a greater risk of being anemic compared to children who are not stunted, however in India, this has not been seen to be the case. This indicates that cost-effective programming must be underpinned by meticulous research, and that targeted measures with tailored activities are likely to acquire greater traction than standard expenditures that are designed to be universally applicable to all situations. Even though it is necessary, simply encouraging a child's growth may not be enough to prevent or treat anemia, and vice versa.

For instance, the effects of iron supplementation on linear development have been the subject of research that have produced conflicting results. Comprehensive research came to the conclusion that children using iron supplements do not see any discernible benefits to their linear growth. On the other hand, the difference between supplementing iron-depleted children and iron-repleted children was not taken into consideration in that systematic study. Therefore, despite the fact that iron supplementation did not appear to affect growth in their analysis, it is likely that treating anemia in specifically anemic children could contribute to improving linear growth. At the same time, if the necessary steps were taken, a reduction in the prevalence of stunting may be of assistance in the treatment of anemia. Due to the fact that anemia and stunting are both prevalent among children across South Asia, there is a chance to combat both of these illnesses at the same time.

Anemia was caused by a lack of better cleanliness in the household and a lower income index in Nepal and Pakistan, respectively. Both of these factors contributed to the prevalence of anemia. In the same vein, unimproved sanitary facilities and water supplies, in addition to a lower income index, were all factors that contributed to the prevalence of anemia in Bangladesh. Extensive study has shown a correlation between markers of socioeconomic position and nutrition, and it is widely known that socioeconomics is a significant factor in the development of anemia. As a result, the findings of this study highlight the need of directing efforts toward children who come from low-income homes and population groups that are difficult to access and socially marginalized.

Repercussions For Public Policy

Anemia caused by a lack of iron is one of the top 10 major causes of young deaths in South Asia (and among the top 5 in Afghanistan, Bangladesh, India, and Nepal, 2013). This condition has significant human and economic implications for the nations affected. According to Horton and Ross's research from 2003, the yearly physical productivity losses alone contributed to a median cost of $2.32 per capita for iron deficiency in 10 developing nations. This represented 0.57% of the total GDP. This climbed to $16.78 per capita (almost 4% of GDP) when both physical and cognitive productivity losses were taken into consideration.

Cost-effective treatments for anemia can be found in programs that focus on addressing particular types of anemia. When calculating the cost-effectiveness of iron supplementation and fortification, Baltussen found that iron supplementation would avert 2.5 million disability-adjusted life years (DALYs) in Africa and Southeast Asia at 95% coverage. This was based on the assumption that iron supplementation would prevent anemia. For a coverage rate of 95% in Southeast Asia, the cost of iron supplementation would be 115 dollars per DALY avoided. The cost of iron fortification would be 35 dollars in international currency for every DALY that might be saved.

In addition to supplementation and fortification, there is a need for increased dietary intake of iron-rich foods. Efforts to achieve this goal are required. These dietary changes may be impeded by factors such as accessibility, including availability, geographical location, and financial resources, as well as by cultural and religious views. Programs that teach people how to grow their own food at home have been demonstrated to improve diets and cut rates of anemia in children and women. This potential intervention has already been implemented in a number of different nations, including Bangladesh and Nepal, amongst others.

Although fortification and supplementation are cost-effective approaches to preventing and treating anemia caused by nutritional deficiencies, it is important not to overlook the possibility that anemia could be caused by other factors. Anemia can also be caused by a number of other viral infections and hereditary abnormalities. In such circumstances, correcting anemia with micronutrient supplementation or fortification is not possible. Depending on the circumstances that are present in a given setting, dietary improvement and micronutrient supplementation and fortification may be considered alongside water, hygiene and sanitation interventions, deworming, and malaria prevention and treatment. Given the limited diagnostic capabilities available for genetic hemoglobin disorders in rural and resource-deprived areas, the presence of these disorders in developing countries presents an additional challenge.

In different South Asian nations, different levels of political commitment and scope have been allocated to the fight against anemia in children and women. After discovering that offering services to communities in a more convenient location via the efforts of Female Community Health Volunteers enhanced iron and folic acid (IFA) coverage and compliance, the program was gradually expanded up to 74 of the 75 districts between 2003 and 2012. This program leveraged the already established infrastructure of the Female Community Health Volunteers in order to carry out its objectives of providing antenatal care (ANC) visits, iron folic acid supplements, and deworming prophylaxis to pregnant women. This initiative was credited for contributing to the reduction in anemia rates among women, which went from 68% to 36% between the years of 1998 and 2006.

Nevertheless, despite the ongoing efforts of the IMNMP, the prevalence of anemia had only decreased by 1% by the end of 2011 since 2006, when the program began. Because anemia is caused by many factors, apart from iron deficiency and worm infestation, the IMNMP program could contribute to the reduction of anemia due to iron deficiency and worm infestation, but other causal factors will need to be explored. The success of Nepal in eliminating anemia between 1998 and 2006 is encouraging. It is expected that the Nepal National Micronutrient Status Survey 2014 (findings expected in 2015) will document the multifactorial etiology of anemia in Nepal and provide an evidence base to revise the national strategy for the control of anemia that can bring about further reductions on anemia among children, adolescents, and women.

The Ministry of Health of Pakistan produced a Maternal and Child Health Policy and Strategic plan (2005–2015) that featured minimal attention on anemia prevention, while the plan did include dietary recommendations and vitamin supplementation. A large-scale fortification initiative is ongoing, including the fortification of wheat flour with iron, which is projected to lower the prevalence of anemia. Although the fortification program is promising, Pakistan may need a more comprehensive strategy to reduce anemia—particularly among young children, who are likely to benefit less from large-scale fortification of wheat flour with iron that considers the multifactorial etiology of anemia, as seen in countries such as Bangladesh and Nepal and the potential for impact of each of the interventions in the population groups at a higher risk of anemia (i.e., young children, adolescents and women of reproductive age).

OBJECTIVES OF THE STUDY

1. To the study of the Policy implications in iron deficiency.
2. To the study of the Predictors of anemia health challenge for women and children

RESEARCH METHODOLOGY

The population, the data source, and the sampling approach

The findings of this study were derived from the ten most recent Demographic and Health Surveys (DHS) that were carried out in Eastern African nations between the years 2008 and 2014 These nations consisted of Burundi, Ethiopia, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zimbabwe, Madagascar, and Zambia. Zambia was the only African nation that did not participate. Because the remaining two East African countries, Kenya and Comoros, did not have any recorded cases of anemia or levels of hemoglobin in the data set, these nations were not included in this investigation. In order to carry out their stratified cluster sampling method, the DHS made use of the respective population and housing censuses as a sample frame. The survey was given to a total of 101524 female participants who were of reproductive age, and the replies received were weighted.

DATA ANALYSIS

Characteristics of society and the general population in their entirety

This study was conducted with the help of a total weighted sample of 101524 women who were of reproductive age. The majority of the participants came from Ethiopia (14.70%), making up the sample's largest single country of origin. The age of the participants in the study ranged from 15 to 19 years old for the majority (21.97%), with the median age of the participants being 28 years old (interquartile range = 20–35). The vast majority of those who participated in our study had attained at least a basic school education (47.86%), and 62.18 percent of them were married. 56.75% of those who participated in the poll either had employment or were actively looking for work at the time it was conducted. Approximately one fourth (24.23%) of the participants were from families that were in the top wealth quintile. In terms of the gender of the head of the household and past exposure to the media, about 70.45% and 66.79% of respondents were from male-headed households and had previous exposure to the media, respectively. Also, all respondents were exposed to the media at some point. Only 44.71% of the participants came from households that had improved toilet facilities, whereas more than two-thirds of the participants came from households that had

access to improved water sources (69.85%). When it came to the number of children that each respondent had, 34.68 percent of them had multiple children while 26.90 percent of them did not have any children. Despite the fact that over three quarters (71.56%) of respondents resided in rural regions, the majority of respondents (59.02%) did not consider that the distance between their house and the nearest health institution was a significant impediment.

Table 1. Respondent socio demographic.

Variables	Frequency	Percentage
Country		
Burundi	8587	8.46
Ethiopia	14923	14.70
Madagascar	8308	8.18
Malawi	7933	7.81
Mozambique	13571	13.37
Rwanda	6680	6.58
Tanzania	13063	12.87
Uganda	5988	5.90
Zambia	13234	13.04
Zimbabwe	9236	9.10
Age (years)		
15–19	22301	21.97
20–24	18900	18.62
25–29	17163	16.91
30–34	14632	14.41
35–39	12165	11.98
40–44	9286	9.15
45–49	7077	6.97

Educational level		
No education	21503	21.18
Primary	48585	47.86
Secondary	27817	27.40
Higher	3619	3.56
Marital status		
Never married	26233	25.84
Married	63127	62.18
Divorced/widowed/separated	12164	11.98
Occupation		
Working	57612	56.75
Not working	43912	43.25
Household wealth quintile		
Lowest	18306	18.03
Second	18651	18.37
Middle	18940	18.66
Fourth	21025	20.71
Highest	24602	24.23
Sex of household head		
Male	71520	70.45
Female	30004	29.55
Media exposure		
Yes	67811	66.79
No	33713	33.21

Type of toilet facility		
Improved	45387	44.71
Unimproved	56137	55.29

The study of random events and the changes that can arise in the incidence of such events.

Both the ICC and the MOR conducted research in order to get a better understanding of the extent to which variation may be found at the community level. According to the findings that are shown the ICC and MOR values in the null model, which were 6% and 1.54 respectively, offer indication that anemia was clustered at the community level or that there was community level variability. These values were derived from the data that was collected. The null model may have these variables in its database.

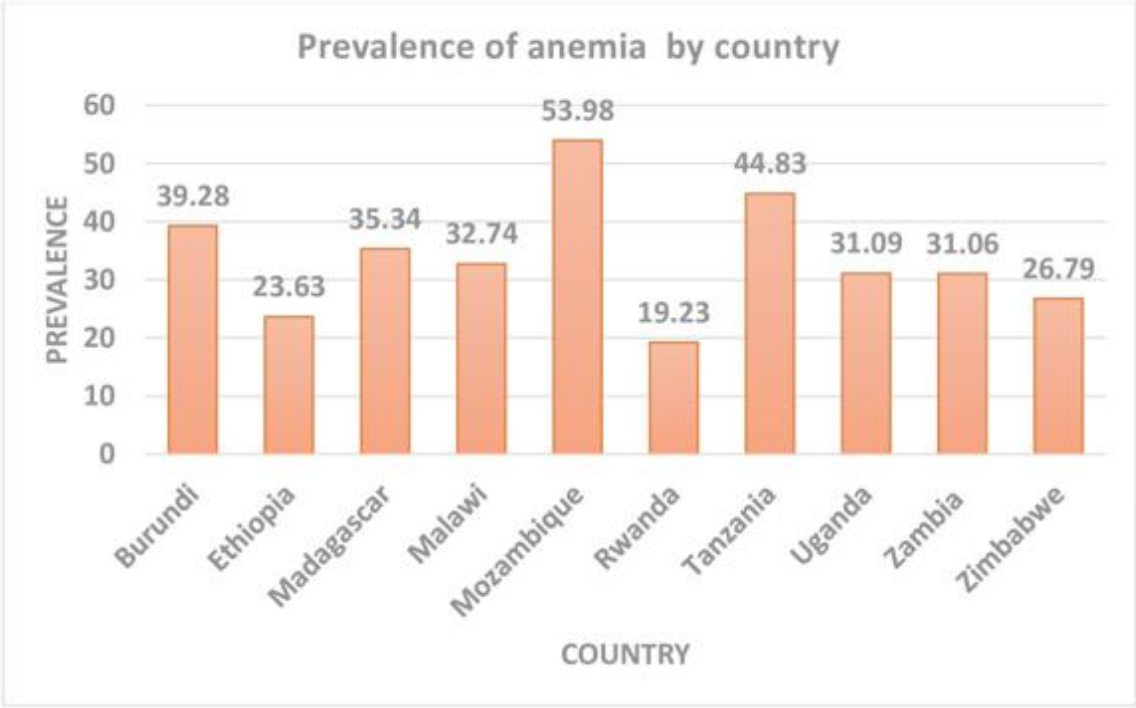

Fig 1. Anemia prevalence in eastern Africa.

In addition, the partial correlation coefficient (PCV) that was highest in the final model (model 3) revealed that bigger proportions of the variation in anemia in women of reproductive age could be explained by both individual level and community level variables. This was proved by the fact that the PCV was the highest in model 3. This was demonstrated by the fact that model 3 received the best score out of all the models. This specific model boasts the industry's highest possible PCV rating. Regarding the comparison of the models, deviation was the criterion that was applied in order to choose which of the four models provided the best fit. The model that ended up being chosen was the one that offered the optimal level of compatibility.

CONCLUSION

It was discovered that a sizeable portion of the population in eastern Africa was suffering from anemia. There was a connection between the prevalence of anemia in women of reproductive age and a variety of factors that might be found at either the individual or the community level. As a consequence of this, lowering the incidence of anemia in women of reproductive age might be achieved by focusing extra attention on pregnant women, younger women, and those who originate from families with a poor socioeconomic position, sources of drinking water, and bathroom facilities that have not been upgraded.

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