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Improving Iron Deficiency Anemia Amongst Females in the Democratic Republic of Congo (DRC)

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Abstract

Improving Iron Deficiency Anemia Amongst Females in the

Democratic Republic of Congo (DRC)

By Gloria Bognin

This research project aims to improve knowledge about and treatment for iron deficiency anemia amongst females in the Democratic Republic of Congo (DRC). Young children and pregnant women are set to be the most impacted groups by the significant anemia burden globally, which is marked by less than 11 g/dl of hemoglobin in the blood (World Health Organization, 2023). Over two-thirds of pregnant women and children under 5 are anemic worldwide (World Health Organization, 2023). Anemia is a severe public health problem in the DRC where 52.8% of non-pregnant women and 67.3% of pregnant women were estimated to be anemic (World Health Organization, 2008). People in the rural villages of DRC suffer the most from anemia. Children born to women suffering from anemia and giving birth at a young age may experience low birth rates, stunting, premature birth, and depression (Harvey-Leeson, 2016). In addition, food is an excellent source of increasing iron levels in the body if iron supplements are not available or inaccessible.

This project aims to share information about iron deficiency anemia with girls and pregnant women in the DRC. The aim will be accomplished by developing an educational poster written in English and French that will include information about the effects of anemia on the body, treatments available, and advocating for the consumption of locally produced food available in the country to improve iron levels. In addition, this educational poster will help improve knowledge about iron deficiency anemia in the DRC amongst females and change their eating habits to reduce its prevalence.

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Thank you to my friends, mentors and family for their support. I want to dedicate this work to my grandmother who was never given the opportunity to go to school as a child. I'm proud and blessed to be afforded the opportunity to attend the best school and be taught by the best and make her proud. I share this accomplishment with her and all the women that came before me that were not afforded the opportunity to go to school.

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Introduction

Anemia is a severe global public health issue, defined as a hemoglobin level below 11.0 g/dL. (Mahadea et al., 2021). Pregnant women and children are disproportionately affected by anemia (Mahadea et al., 2021). While pregnant women are more likely to develop anemia, anemia among women in general increases the risk of maternal morbidity and mortality and lowers their productivity levels (Ngnie-Teta et al., 2009). Moreover, maternal anemia may increase the chances of preterm birth and low birth weight for the fetus, along with perinatal and neonatal mortality (Ngnie-Teta et al., 2009). Anemia during pregnancy can present in a variety of symptoms include fatigue and weakness, dizziness or lightheadedness, and headaches. Other symptoms include pale or yellowish skin and shortness of breath (Bahizire et al., 2017). Anemia can also affect children in many ways through increased morbidity and mortality. Persistent anemia can have long-term effects on children's physical and intellectual development (Bahizire et al., 2017). The chance of a newborn death whose mother has IDA either before or right after birth is also high.

In Africa, 62.3% of children are anemic, which is greater than the global average of 42% among children aged five and under (Mahadea et al., 2021). With a population of 67.8 million, DRC is the second-largest nation in Africa (CEIC, 2023). The prevalence of anemia in the Democratic Republic of Congo (DRC) among children under the age of five is 63% (Mahadea et al., 2021). Moreover, anemia is prevalent among pregnant women in the DRC at a rate of 60%, making it a severe public health issue (Bahizire et al., 2017). Most cases of anemia among pregnant, lactating, and non-pregnant women reported in the 2007 DRC Department of Health Statistics (DHS) are mild to moderate in severity. Less than 1% of anemia cases in breastfeeding or non-pregnant women and only 2.7% of anemia cases in pregnant women are classified as

severe (USAID, 2018). While severity levels may not always be high, anemia remains a significant public health concern among women and children in DRC.

Literature review

Anemia can have many different causes. In Africa, malnutrition significantly contributes to this disease (Messina et al., 2013). Adult anemia can also be brought on by deficits in particular minerals like iron and vitamin B-12 (Messina et al., 2013). In addition, infectious diseases such as malaria can increase the chances of anemia. Malarial anemia caused by the plasmodium P Falciparum leads to approximately one-third of disease-related deaths in Africa (Zegeye et al., 2021).

Iron deficiency anemia (IDA) is a form of anemia in which a lack of iron in the body causes a decrease in red blood cells. Iron is used in the production of red blood cells, which aid in storing and transporting oxygen in the blood (Tata et al., 2019). IDA is a clinical condition that reduces the oxygen-carrying capacity of blood by decreasing the blood hemoglobin (Hb) concentrations (Bahizire et al., 2017). This is a concern because oxygen supply to tissues is needed for physiological activities, especially in conditions of high demand, such as exercise and pregnancy (Bahizire et al., 2017). Fatigue, weakness, dizziness, heart attacks, and chest discomfort are all frequent symptoms of IDA (Messina et al., 2013). IDA is the focus of this public health project.

Treatments of IDA

Limited information is available regarding the micronutrient status of Congolese women of reproductive age and their young children (MOST USAID Micronutrient Program, 2004). Iron supplementation via oral pills helps to increase iron in the body and is the most commonly used treatment for IDA (NHLBI, 2022). Iron levels are usually restored in three to six months with proper and efficacious treatment (NHS Inform, 2023). Intravenous (IV) iron delivery is another

treatment that introduces iron directly into the bloodstream, which can more quickly improve IDA (NHLBI, 2022). Blood transfusions with non-anemic blood can also boost red blood cells and iron in the blood (The World Bank, 2004). While treatments exist for IDA, several barriers prevent access to or adherence to these treatments for women and girls in DRC.

Barriers to improvement in IDA

In order to understand barriers related to the clinical treatment of IDA in the DRC, it is vital to consider the political, social, and health meta-contexts affecting people in the country. DRC is one of the poorest nations in the world, with more than 70% of the population living on $1.90 a day; this has resulted from years of terrible conflict and political unrest (Mendez, 2020). Women struggle to support their families since their salary is lower than the norm. Due to inadequate healthcare infrastructure, a lack of funding, and inadequate government support, women in the DRC also experience several health issues, with an average life expectancy of 63 years (Mendez, 2020). Due to inadequate infrastructure and surveillance, illness outbreaks are common in the DRC, and individuals have limited access to medical care (Médecins Sans Frontières, 2023).

Women and girls in the DRC have many health problems from an early age. Many suffer from sexual assault and rape (Mendez, 2020). More than 50% of DRC women have been victims of sexual abuse (Mendez, 2020). Sexual harassment in hospitals and health facilities may deter some girls or women from seeking medical care. Without proper healthcare facilities and fear of potential further assaults or harassment, most suffer alone without any sort of intervention. In addition, many of the females experiencing sexual assaults contract sexually transmitted diseases

which further increases their suffering. Médecins Sans Frontières (MSF) has established clinics that provide healthcare services to support females (Médecins Sans Frontières, 2023).

Women's burden of HIV/AIDS in the DRC is also relevant to their health-seeking behavior. Over 4,100 new cases of HIV/AIDS in women ages of 15 and 34 were reported in 2013 which represents a doubling over the previous year (Mendez, 2020). HIV infection affects more than 400,000 adults in the DRC, with ~72% of those disproportionately being female (Mendez, 2020). Of the 4,100 cases, only 58% of women received treatment and care compared to 73% of males (Mendez, 2020). In 2018, more than 16,000 people died from AIDS-related causes: Chlamydia, gonorrhea, bacterial vaginosis, genital herpes, and other prevalent STDs (Ba, 2019). With HIV/AIDS acting as a barrier to their health-seeking, women may also be less likely to seek anemia-related care.

In the City of Goma, located in the North Kivu province of the DRC, the spouse or family head is frequently required to provide permission to use a medical facility, thus usurping a woman's power to make their health-based decisions. In addition, clinicians are far from being unbiased as medical staff are influenced by prevailing cultural and religious standards, which impact the services offered (Moumin et al., 2020). Thus, females in the DRC face many barriers to accessing proper health services including access to iron supplements for IDA.

Even when proper healthcare can be obtained, iron supplementation is often a non-viable option for improving IDA. Many pregnant women in Sub-Saharan African nations do not take iron supplements as directed because they are unaware of the risks associated with IDA (Biaba Apasa et al., 2018). Additional barriers include the lack of wide availability of iron tablets, their cost and misinformation about their health care coverage of the cost, forgetfulness, and inadequate counseling (Messina, 2013).

Poor finance, systemic and structural issues, poverty, lack of appropriate treatment, testing, and education are a few of the many obstacles the nation faces in providing good healthcare to women (McWilliams, 2020). However, these are the main concerns that impact women's health in the DRC (McWilliams, 2020). Given these economic constraints and a failure to seek medical intervention, females need simpler, less burdensome ways to improve their iron levels. In order to prevent childhood-onset and adult-onset anemia, dietary interventions have been introduced in most developing countries and across the DRC (Mahadea et al., 2021). However, many women still may not have sufficient knowledge of or understand which dietary components they can afford that may be most therapeutic for their anemia.

Nutrition education is critical for improving knowledge and long-term health benefits (CDC, 2021). It is a viable, long-term solution in resource-constrained environments (CDC, 2021). For instance, an educational study in Nigeria was effective in reducing the prevalence of childhood IDA. This study targeted caregiver education through information about anemia, dietary prevention strategies, and sustainable lifestyle (Nwaba et al., 2022). The baseline revealed that knowledge levels among caregivers regarding their child's anemia diagnosis were low. Those who provided education assisted in increasing anemia knowledge (Michaux & Boy, 2020). As other African countries have taken steps to use education to teach their communities about iron deficiency, the same can be done in the DRC. This education poster will increase population knowledge of the root causes and treatments for IDA, particularly females living in the rural population.

This research project aims to improve the educational levels of females in the DRC regarding IDA by sharing simple, understandable information about IDA with girls and pregnant women in the DRC. The focus is on educating females on the prevalence, sources, and symptoms

of IDA and providing nutritional guidance that may help them better control their anemic status. It is vital for younger females to learn about iron deficiency at an early age because research in other parts of Africa has shown that early interventions can be impactful in improving anemia levels (CDC, 2021).

Significance

This educational poster will define anemia, what it does to the body, how it affects pregnant females and their babies, and how females can access iron supplements or food sources to increase iron levels. This information pamphlet will be distributed to local clinics, schools, community partners, and parents at home. The materials provided will increase knowledge and awareness of iron deficiency. In addition, it will encourage girls and women to take better care of their health.

Methods

This project used information dissemination methodology (Toro-Jarrin et al., 2016) to create an educational poster for improving IDA among girls and pregnant women in the DRC. The most salient and important information gleaned in the literature review was summarized in simple language and placed on the infographic to enable easy interpretation and digestion of the information. To improve readability and to garner attraction, the infographic was created with a mixture of simple text and photos. This educational poster includes pictures and a brief description defining IDA. It is aimed to help visualize and catch the attention of people, particularly pregnant females. Creating a visual picture will help girls and women in the DRC understand the meaning of IDA, how it affects the body, side effects, nutrition, effects during pregnancy, and treatments. This educational poster will help educate women and girls in the DRC.

The poster was created using the open-source website Canva Pro, Inc. which operates a graphic designing platform based out in Australia. A pre-configured template of a one-page poster was chosen that could accommodate all the information and graphics. A one-page poster was preferred because it would be easy to post around clinics, hospitals, markets, etc. Canva is an accessible site for design tools such as presentations and poster booklets. It provides access to professional designs for art creation. Bright colors were included to make the poster and its information stand out. This poster covers three areas that will help educate the public about IDA. The areas include what iron deficiency is, symptoms of iron deficiency, and tips for using local food to improve IDA. The most common foods that are rich in iron are cassava root and leaves, meat, fish, spinach, beans, and other local legumes (PHNI Project, 2003). Cassava is the most common food crop in the DRC. Many people in the DRC can harvest and grow cassava at home

(Mulumba, 2023). Most people living in rural communities depend on harvesting food and growing vegetables to sell to make money (Metro South Health, 2015). It was essential to include the local food information on the poster so the target population could relate and know that their locally cultivated food could help improve iron levels.

Additionally, an URL link was added to the bottom of the poster to provide additional information from a USAID project conducted in 2017 to help improve IDA for women in the DRC. This graphic provides more scientific details on how IDA can impact pregnant women and their babies. The graphic offers excellent vision and statistics. An educational poster board will also be helpful for women and girls who cannot read. The picture will give an understanding of the critical matter of this project and hopefully enable females to quickly understand the information from this poster.

Deliverable

This poster targets the rural communities in the DRC. The people that suffer the most from IDA are people in the rural villages. South-Kivu, one of the rural communities, has a population of almost 6 million but still has inadequate access to healthcare (The World Bank, 2004). Many women who suffer from IDA have children at a very young age and experience many complications with their pregnancies or infants including stunting, premature birth and depression (Messina et al., 2016). Children living in rural communities do not have good access to education as do other children in private schools in the city. DRC is hampered by low educational enrollment and subpar instruction (USAID, 2004). 3.5 million children who should be in kindergarten are not, and of those who are, 44% start later than the recommended age of six (USAID, 2018). Just 67% of children who start first grade will finish sixth grade, and only 75% of students will pass the exit exam by the time they reach sixth grade (MOST USAID Micronutrient Program, 2004). Therefore, targeting school-aged children is essential.

This infographic is targeted to females and pregnant women in the rural community in the DRC, as these are key decision makers for nutritional choices. By providing them with actionable information they will be able to take better care of themselves if they feel like they have symptoms of IDA. The infographic is visually attractive and easy to understand, generating interest among female who see it.

Nonprofit organizations, local health authorities, and other key stakeholders can use this poster as one mechanism to address the challenge of IDA. They will place the poster in locations frequently visited such as clinical settings, schools, community support centers. The poster will be placed indoors, where it will be protected from elements. If placed outdoors, it can be laminated to ensure it is durable. In addition, this poster can be used by individuals conducting

door to door outreach in rural villages. This can also be helpful because it gives the opportunity to interact with the community and educate them. The intended outcome is raising awareness of the symptoms and interventions for IDA. Placing the poster in these frequently visited locations will help achieve this outcome by ensuring that it reaches a large number of women.

Discussion

Women's health as it pertains to IDA may be affected by many other issues and policies through complex pathways. For instance, women's economic conditions are affected by the high rates of poverty in DRC. Despite possessing remarkable natural resources, the DRC is among the world's poorest nations, ranking 186th out of 187 nations on the Human Development Index (Fanzo, 2012). More than 70% of people in the DRC are considered to be poor (Mbunga et al., 2021). Moreover, the civil unrest and policies affecting war in DRC can indirectly impact women's health. Almost 2 million civilians have died as a result of decades of armed war, and an estimated >1 million women have been sexually assaulted since 2010 (Mbunga et al., 2021). While women's representation in leadership roles is known to affect egalitarian policy making in many spheres, women only hold 7.2% of the highest-ranking positions in the parliament and administration in DRC. Thus, improving IDA among females in DRC is also significant for the larger sociopolitical climate of the country.

Given that IDA impacts pregnant females to a great extent in the DRC, this issue also has implications for demographic policies aimed at changing fertility patterns in the country. The DRC's fertility rate of 6.6 children born per mother is one of the highest in the world. (USAID, 2022). Moreover, contraceptive use is low such that between 2007 and 2013, the prevalence rate only increased from 6 to 8 percent (USAID, 2008). It is noted that 14 percent of women of reproductive age and nearly 39 percent of anemic women are underweight (Congressional Research Service, 2022). Moreover, the prevalence of malnutrition has remained relatively high for the past 20 years (World Health Organization, 2023). Among children under five, 43% are stunted, a sign of chronic malnutrition, and 8% are wasted, a sign of acute malnutrition (CDC,

2021). These poor nutritional health outcomes are a concern for fertility patterns and improving IDA is relevant to them as well.

The organization Engender Health has worked in the DRC to enhance access to high-quality sexual and reproductive health and rights (SRHR) information and services for all females (Sun et al., 2021). The organization works to guarantee that sexual and reproductive health services are high-quality and gender-equitable and that processes, legislation, and policies support SRHR and gender equality. My poster can be utilized by a program like Engender Health to create a wider reach for messaging around IDA.

Under ExpandFP II program, Engender Health has collaborated with the DRC Ministry of Health, Humana People to People, and partners REEJER and Le Réseau des Educateurs des Enfants et Jeunes de la Rue (REEJER) to increase the integration of postpartum family planning (FP) (EngenderHealth, 2023). They have implemented postpartum family planning throughout 15 clinics in Kinshasa in cooperation with the ministry. While educating women on family planning in school, clinics or community centers this infographic poster can be a tool to use to also teach about IDA. The United States Agency for International Development's (USAID) also strengthens the DRC's fragile health system through improvements in services delivery at the national, provincial, and local level (UNICEF, 1999). USAID provides primary health care services to over 12 million people in 78 health zones and 103 malaria-supported health zones in a total of seven provinces in the country (USAID, 2023). In addition, the HIV/AIDS assistance provided by USAID is concentrated in 21 health zones in Kinshasa and Katanga (USAID, 2018). While these services exist, there are no infographic online available like the one I have created to show women and girls, particularly pregnant women, how to improve their health by changing their nutrition. Moreover, despite the facilities provided by USAID many people may not be able

to afford treatments or have transportation access to the clinics. Having this infographic poster with pictures of showing symptoms will help individuals seek other way of treatments such as eating more protein, beans, or green legumes.

USAID also assists the Ministry of Health (MOH) in streamlining and decentralizing the public sector "Men as Partners in Maternal Health" sought to increase men's involvement in their partners' pregnancies in order to reduce maternal mortality rates. This effort also emphasized the importance of involving men in the promotion of gender equality and the advancement of women's reproductive rights (Gage et al., 2022). Local men in the rural villages hunt for food to bring home to their wives or family to cook. This poster can teach them the importance of proteins such as beef, fish, and beans as important for improving IDA. If a man with a pregnant wife or partner reads the infographic, they can learn from this poster that it's important for him to provide his partner with foods that are iron-rich to ensure the safety of the mother and fetus.

Working with men is an important strategy for improving maternal health (Tata et al., 2019). "Partnering with men is an important strategy for advancing reproductive health and rights," writes UN Secretary-General Ban Ki-Moon in an East African opinion piece, adding that "gender equality... is most likely to be achieved when men recognize that men and women's lives are interdependent and that women's empowerment benefits everyone" (UNICEF, 1999). USAID also provides technical and financial assistance for the development, implementation, monitoring, and evaluation of annual operational plans at the provincial and local levels, as well as training for communities to identify and address health-related issues using locally available resources (USAID, 2017). Officials from the United Nations Population Fund have urged women in the country to have greater access to reproductive services such as family planning, qualified

midwifery, and obstetric care (United Nations Population Fund, 2021). Among Congolese women aged 15-49 years, 15.5% use modern contraceptives (EngenderHealth, 2023).

The methodology for developing this educational poster has strengths and limitations. One strength of the methodology is that the poster is based on a literature review which ensures the content of the poster is based on the available evidence. Another strength is that, I believe, it is easy to read and understand. One limitation is that when there is a war conflict the posters might get destroyed. Another limitation is that there might be additional treatments in the future which will not be included in this current poster. Since this poster is printed on paper, it will be difficult to quickly update it if there are new developments in the evidence.

In conclusion, IDA is a major health burden for female in the DRC. This educational poster, which was developed by conducting a literature review, summarizing key points and creating an easy-to-understand infographic, will help educate the public on IDA and will help to benefit women's health. The poster will educate females and show them they have the tools to address IDA via the food they eat. Stakeholders can use the poster to raise awareness and change the behavior of female.

Public Health Implications

IDA is a global health problem and a specific concern for the DRC. First the educational poster in this project can benefit females in the DRC suffering from anemia by guiding them on alternative sources of iron when they are unable to access iron supplements. Second, by using this poster, the rural community of DRC can learn about what IDA means, the side effects, how it can impact their health, symptoms and treatments including local cultivated food that can help improve their iron level. Finally, the pictures on the poster are easy to understand even if one doesn't know how to read the communication. This pictorial quality of the poster makes it more accessible than other forms of heavy text-based informational messaging around IDA.

Appendix A: Educational Poster (English) on Improving Iron-Deficiency Anemia in DRC

IMPROVING IRON-DEFICIENCY ANEMIA (IDA) AMONG GIRLS AND PREGNANT WOMEN IN DRC

1 WHAT IS IDA

Iron deficiency anemia (IDA) occurs when the body doesn't have enough iron to produce hemoglobin. Hemoglobin is the part of red blood cells that carries oxygen throughout the body. Severe IDA may raise your chances of damage to the heart, such as an unusually quick heartbeat (tachycardia) or heart failure where the heart is unable to pump blood at the adequate pressure.

2 SYMPTOMS OF IDA

Shortness of breath

Fatigue and weakness

Heart palpitations

Headaches

3 TIPS FOR USING LOCAL FOODS TO IMPROVE IDA

- Cassava leaves and roots combined with meat provide an iron-rich meal and other nutrients
- Fish mixed with vegetables such as spinach leaf can also provide a great source of iron nutrition
- Locally cultivated Beans, nuts and seeds also provide high content of iron

Iron supplements can also improve iron deficiency anemia when taken orally in the form of a pill or through intravelous injections.

For further information: advancingnutrition.org
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Appendix B: Educational Poster (French) on Improving Iron-Deficiency Anemia in DRC

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