Perceived Risk Factors of Anaemia in Under-five Children among Childbearing Mothers in Owerri North Local Government Area, Imo State, Nigeria

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Abstract

Anaemia in under-five children remains a significant health issue especially in the developing countries with Nigeria inclusive. This study investigated perceived risk factors of anaemia in under-five children among childbearing mothers (CBMs) in Owerri North Local Government Area, Imo State. Three research questions and two null hypotheses guided the study. The study adopted descriptive cross-sectional survey research design. The population for the study consisted of 40,000 CMBs in living in Owerri North Local Government Area, Imo State. The sample size was 400 CMBs drawn using multi-stage sampling procedures. A self "Perceived Risk Factors of Anaemia in Under-five Children Questionnaire (PRFAUFCQ)" was used for data collection. Descriptive statistics of mean, standard derivation and ANOVA test were used to answer the research questions and hypotheses respectively. Results indicated that CMBs in agreed on the perceived risk factors of anaemia in under-five children since mean 3.63. CMBs irrespective of their age agreed on the perceived risk factors of anaemia in under-five children: mother's age of 3.17, 15 -24 years had x mean response of 3.17, those 25 -34 years ($\overline{x}$ = 3.32), mother aged 35 – 44years ($\overline{x}$ = 3.43) and those aged 45years and above had ($\overline{x}$ = 3.32). Also, CBMs irrespective of their level of education agreed on perceived risk factors of anaemia in under-five children: CBMs with primary education had ($\overline{x}$ = 3.59), those with secondary education ($\overline{x}$ =3.63), and mothers with tertiary education ($\overline{x}$ = 3.76). There was a significant difference in the perceived risk factors of anaemia in under-five children among mothers in Owerri North LGA based on age. Furthermore, the result showed that there was no significant difference in the perceived risk factors of anaemia in under-five children among mothers in Owerri North LGA based on level of education. The non-significant different on the perceived risk factors of anameia in under-five probably because anaemia is one of the problem children under five years in the Local Government Area encounter most. The authors recommended among others that health care workers should educate mothers especially lactating mothers and those with children under-five years of age about good dietary practices and the benefit of exclusive breastfeeding.

Keywords: Anaemia, Risk factors, Childbearing mothers, Under-five children, Perceived

Introduction

Anaemia constitutes a global public health problem, affecting people of all ages, both in the developed and developing world. It is one of the most serious and common national deficiency disorders of public health concern especially in the developing countries including

Africa. Anaemia can affect people of all ages, but under-five children are among the most vulnerable. Robert *et al,* (2010) reported that approximately 83.55 million children are affected by anaemia and its prevalence is 67 percent. World Health Organization [WHO] (2021) reported that in 2019, an estimated 39.8 percent of under-five children were anaemic globally, of these 60.2 percent were from African region. Furthermore, Id and Jibril (2022) reported that an estimated 1.3 billion people around the globe are affected by anaemia and about 9.6 million children are severely anaemic. The magnitude of anaemia in developing countries is high since they are more exposed to various health and socio-economic problem which directly or indirectly are related to anaemia. As at 2016, it was estimated that 57 percent of children under five years in Ethiopia had anaemia with regional variation ranging from 42 per cent in Amhara region through 83 per cent in Somah (Ethiopia Demographic and Health Survey, 2016). The burden of this disease remains high in Nigeria as its prevalence among under five children increased from 60 per cent in 2015 through 68.1 percent in 2018 (Nigerian Demographic and Health Survey, 2018).

Anaemia can be described as decrease in the Oxygen-carrying capacity of the blood. Anaemia according to WHO (2015) is defined as a decrease in the concentration of circulating red blood cells concentration and a concomitant impaired capacity to transport oxygen. It is a low number of red blood cells in which the haemoglobin content of the blood is lower than the normal range as a result of deficiency of one or more essential nutrients. Anaemia is characterized by low haemoglobin concentration, red-cell-count, or packed cell volume with subsequent impairment in meeting the oxygen delivery to the demands of issues. Zufflo (2016) opined that a child less than five years is anaemic, if the blood haemoglobin is less than 110g per litreHgb<11.0gldt. Anaemia is caused by many factors such as lack of iron in the diet, poor iron absorption, increased iron requirements and raised iron lost from the body. In this study anaemia is a condition in which the number of red blood cells is lower than normal.

The primary cause of anaemia is intake of diets with inadequate iron sources. Other causes include deficiencies of folate, Vitamin B12, Vitamin A & C, proteins which maintain haemoglobin level. B-complex group and amino acids as well as smoking, pregnancy status and pantothemic acid (Kejo et al., 2018; Din et al., 2019). Iron deficiency is the most common cause of anaemia and accounts for approximately 50 per cent of all anaemia cases across the globe (Kejo et al., 2018). Iron deficiency anaemia is a serious nutritional problem that affects people all over the world.

Anaemia can be classified into different forms such as mild, moderate and severe anaemia. Mild anaemia occurs when one have slightly lower than normal levels of haemoglobin, i.e, the protein in the red blood cells that carries oxygen throughout the body (WHO, 2015). Mild anaemia may not cause any symptoms, or the symptoms may be so mild that they go unnoticed. Moderate anaemia occurs when levels of haemoglobin is between 20 and 30 percent. Possible causes of deficiencies of moderate anaemia include: iron, Vit. B12 and folate. The WHO further explained that severe anaemia occurs when the blood percent is equal to or below 4 percent. The symptoms include blue colour of the whites of the eyes, brittle nails, lightedness when one stands up, pale skin colour, shortness of breath with mild activity or even at rest. Anaemia is characterized by the following symptoms: dizziness, fatigue and body tension, general body weakness. Other symptoms according Ghana Demographic Health Survey (2014) include dizziness, fatigue, and body tension, general body weakness, loss of appetite. Low body weight, paleness of the skin eye and palm as well as unconsciousness.

Anaemia is associated with numerous risk factors. Fentaw, Belachew, and Andargie (2022) highlighted the risk factors of anaemia in under-five children to include; malaria,

parasitic infections, some diseases with blood loss, poor feeding practices, intestinal anomalies, residence, poor antenatal care visit and family monthly income. Other risk factors are lack of exclusive breastfeeding, acute malnutrition resulting from inadequate intake of nutrients (such as iron, vit.B12, and folate), micronutrient deficiency including Vit. A, riboflavin, copper), hookworm, round worm, schistomaiasis, tuberculosis, acute and chronic infection (Sumbele, Nkemji, & Kimbi, 2017; Khan, Zaheer, & Safdin, 2019). Some demographic variables of the mother are associated with the anaemia of under-five children; they include maternal level of education, age, marital status, occupation, family income among others. The variables of interest in this present study are age and maternal level of education.

Anaemia of under-five children has serious health consequences on the child. Grantham-Mcgregor, and Baker-Henningham (2010) identified the health consequences of anaemia to include; growth retardation, poor immune system, increased susceptibility to diseases, poor cognitive and motor development and behavioural problems, as well as poor school performance. Anaemia creates long term negative effects among female children thus resulting in low birth weight babies and postpartum haemorrhage. Anaemia impairs mental, physical and social development and affects cognitive development of the child, thus resulting in poor school performance and work capacity in later years (Dos et al., 2011). Anaemia also leads to immune compromise; resulting in a decreased ability to fight infections. Villapando (2003) revealed that children with iron deficiency anaemia during their first two years of life develop poor school performance and slower cognitive development and morbidity.

Studies have consistently shown that some demographic variables of the childbearing mothers are significantly associated with the risk factors of anaemia in under-five children. Such demographic variables of interest are age and level of education. Age of the mother is strongly associated with the anaemia of under-five children. Fentan, Belachew and Anadargie (2022) reported that maternal age is strongly associated with the anaemia of under-five children. Children born from older mothers are less likely to be anaemic when compared to children from younger parents (Farbey et al., 2019). As maternal age increases, the mother probably will have more children so that a better experience on child care and feeding will be established. The better the care and feeding practices a child gets the lesser the risk of malnutrition. Furthermore, maternal education is also implicated with anaemia of under-five children. Ahmed (2019) in their study discovered that children born by mothers with no formal and primary education suffered anaemia more than those whose mothers had secondary and higher degrees of education. The author explained that mothers level of education positively influence practices related to the health care and feeding of their children. Educated mothers are more conscious of their children's health and introducing scientifically proved feeding practices, which help to improve their children nutritional status. Ewusie, Ahideke, and Bauene (2014) opined that maternal education is a strong predictor for nutritional outcomes of children. Nazreen et al. (2020) in their study discovered that there is an association between parental education and anaemia in under-five children. The study revealed that children of educated parents were less likely to develop anaemia when compared to children of illiterate parents. The authors explained that the lower odds of anaemia in the children of educated parents may be due the fact that education improves knowledge about healthcare utilization and consumption of diverse food for enhancing the nutritional status of children. It is expected that children under-five years of age would grow without any nutritional problem as measures has been put in place to avert problems resulting from poor nutritional status within this period of their lives such as exclusive breastfeeding, supplementation of vitamin A, provision of drugs for deworming, immunization services

among others. Yet anaemia is still alarming among this group of people in Nigeria as records showed that its prevalence among under-five children increased from 60 per cent in 2015 to 68.1 per cent in 2018 (Nigeria Demographic and Health Survey, 2018). The question is what should be responsible for this high prevalence of anaemia among under-five children in Nigeria with Owerri North Local Government Area inclusive.

Purpose of the Study

The purpose of the study was to investigate the perceived risk factors of anaemia in under-five children among mothers in Owerri, North Local Government Area Imo State, Nigeria Specifically, this study aimed to determine:

(1). perceived risk factors of anaemia in under-five children among CBMs in Owerri North Local Government Area, of Imo State.;

(2). perceived risk factors of anaemia in under-five children among CBMs in Owerri Local Government Area of Imo State based on age; and

(3). perceived risk factors of anaemia in under-five children among CBMs in Owerri Local Government Area of Imo State based on level of education.

Research Questions

(1). What are the perceived risk factors of anaemia in under-five children among CBMs in Owerri North Local Government Area of Imo State?

(2). What are the perceived risk factors of anaemia in under-five children among CBMs in Owerri North Local Government Area of Imo State based on age?

(3). What are the perceived risk factors of anaemia in under five children among CBMs in Owerri North Local Government Area of Imo State based on level of education?

Hypotheses

(1). There is no significant difference in the perceived risk factors of anaemia in under-five children among CBMs in Owerri North Local Government Area of Imo State based on age.

(2). There is no significant difference in the perceived risks factors of anaemia in underfive children among CBMs in Owerri North Local Government Area of Imo State based on level of education.

Materials and Methods

Research Design: The study adopted a descriptive cross-sectional survey research design. Cross-sectional research design produces a snap short of a population at a particular point in time, instead of following a group of subjects over a period of time, where a cross section of the subject under study are sampled and studied at the same time, and data are obtained at one time from groups or at different stages of development.

Area of Study: The study was conducted in Owerri North Local Government Area of Imo State. The LGA is made up of six districts namely Egbu, Naze, Emekuku, Emii, Ihite, Obibi Uratta and Orji. It was observed by the researchers that one of the most common health challenges of under-five children from the Local Government Area is anaemia. This possibly may be due to ignorance on the part of the mothers about the importance of practicing good

nutrition on their children. Children under five years in this locality suffer severe malnutrition which may result to anaemia. Thus, the researchers deemed the area appropriate for the study.

Population of the Study: The population for the study comprised all the childbearing mothers in the six major towns in Owerri North Local Government Area. The projected population of CBMs in the LGA is 40,000 (NPC, 2022).

Sample and Sampling Techniques: The sample size consisted of 420 mothers living in Owerri North LGA. The sample size was determined using Cohen, Manion, and Morrison (2011) standardized table for sample size confidence levels and confidence intervals for random samples, which states, that when a population is 40,000 or above at 95 percent confidence level (5% intervals), the sample size should be 381 or above. Multi-stage sampling procedure was used to draw the sample size. The first stage involved the use of simple random sampling techniques of balloting without replacement to draw three out of the six districts in Owerri North LGA. The second stage involved the selection of two communities from each of the three drawn communities, given rise to six communities that were used in the study. In stage three, purposive sampling was used to select 70 CBMs who are knowledgeable enough to give accurate information needed in the study from each of the six selected communities. This gave a total of 420 CBMs.

Instrument for Data Collection: A researcher's designed "Perceived Risk Factors of Anaemia in Under-Five Children Questionnaire (PRFAUFCQ)" was used for data collection. The questionnaire had a 4-point response option of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The questionnaire was validated by three experts from the Department of Health Education, Alvan Ikoku Federal University of Education, Owerri. A reliability index of .73 was obtained using Cronbach's alpha.

Method of Data Collection: A total number of 420 copies of the questionnaire were administered to childbearing mothers. Out of the 420 copies administered, 377 were returned, which gave a return rate of 89.8 per cent. The 377 returned copies were duly filled out and used for analysis.

Method of Data Analysis: Data analysis was done using mean and standard deviation to answer the research questions, while ANOVA was used to test the null hypotheses at 0.05 level of significance.

Results

Table 1: Mean Responses of Mothers on the Perceived Risk Factors of Anaemia in Under five Children (n-377)

S/N	Items	Mean ($\bar{x}$)	SD	Decision
1.	Low consumption of foods rich in iron is a risk factor of anaemia in under five children.	3.86	0.345	Agreed
2.	Malabsorption of iron rich foods is a risk factor of anaemia in under five children.	3.79	0.405	Agreed
3.	Deficiencies of nutrients such as folate is a risk factor of anaemia in under five children.	3.75	0.428	Agreed
4.	Malaria attack is a risk factor of anaemia in under five children	362	0716	Agreed

5.	Hookworm infestation is a risk factor of anaemia in under five children	375	0502	Agreed
6.	HIV infection is risk factor of anaemia in under five children	355	0724	Agreed
7.	Whipworm infestation is a risk factor of anaemia in under-five children.	355	0724	Agreed
8.	Poor feeding practices is a risk factor of anaemia in underfive children	348	0623	Agreed
9.	Lack of exclusive breastfeeding is a risk factor of anaemia in underfive children	334	0800	Agreed
10.	Poor antenatl visit during pregnancy is a risk factor of anaemia in under-five children.	365	0604	Agreed
	Grand mean	**3.63**	**0.587**	**Agreed**

Table 1 shows a grand mean of 3.63 indicating that CMBs agreed that low consumption of foods rich in iron, malabsoption of iron-rich foods, deficiencies of nutrients, such as folate, malaria attack, hookworm and whipworm infestation, HIV infection, poor feeding practices, lack of exclusive breastfeeding and poor antenatal visit during pregnancy are risk factors of anaemia in under five children. This is because the grand mean value of 3.63 is above the criterion mean of 2.50 and the SD of 0.587 showed that the respondents were homogenous in their responses.

Table 2: Mean Responses of Mothers of Different Age Groups on the Perceived Risk Factors of Anaemia in Underfive from Children (n=377)

Variable	N	Mean (x)	SD	Decision
15-24years	39	3.17	0.674	Agreed
25-34years	78	3.32	0.724	Agreed
35 – 44years	117	3.43	0.383	Agreed
45years and above	143	3.32	0.550	Agreed

Table 2 shows that CBMs agreed on e perceived risk factors of anaemia in under five children irrespective of their age; Mothers aged 15-24 years had a mean response of (3.17), those within 25-34 years had a mean response of (3.32), those aged 35-44years had a mean response of (3.43) while CBMs aged 45 years and above had a mean response of (3.32). The table further showed that CBMs within the age bracket of 35 -44years scored higher than others.

Table 3: Mean Responses of Childbearing Mothers of Different Levels of Education on the Perceived Risk Factors of Anaemia (n = 377)

Variable	N	Mean (x)	SD	Decision

Primary Education	65	3.59	0.412	Agreed
Secondary Education	130	3.63	0.599	Agreed
Tertiary Education	182	3.76	0.547	Agreed

Table 3 shows that CBMs agreed on the perceived risk factors of anaemia in under-five children irrespective of their level of education. CBMs with primary education had a mean response of (3.59), those with secondary education had a mean response of (3.63), while those with tertiary education had a mean response of (3.76). The table further showed childbearing mothers with tertiary education scored higher than others.

Table 4: Summary of ANOVA of No Significant Difference on Perceived Risk Factors of Anaemia in Under five Children among CBMs Based on Age (n=377)

Source of Variation	Sum of squares	Df	Mean square	F	Sig.	Decision
Between Groups	23.723	3	7.907			
Within Groups	11.4524	373	0.307	26.977	0.000	
Total	**138.248**	**376**				

Table 4 shows the ANOVA value for the hypothesis of no significant difference in the perceived risk factors of anaemia in under-five children among mothers based on age (F-cal=26.977, df = 3, p = 0.000<.05). Since the p-value was less than .05 level of significance at 3 degree of freedom, the hypothesis was therefore rejected. This implies that there was a significant difference in the perceived risk factors of anaemia in underfive children among mothers in Owerri North LGA of Imo State based on age.

Table 5: Summary of ANOVA of No Significant Difference on Perceived Risk Factors of Anaemia in Under-five Children among CBMs Based on Level of Education (n=377)

Source of Variation	Sum of squares	Df	Mean square	F	Sig.	Decision
Between Groups	12.501	2	6.250			
Within Groups	125.747	374	0.336	14.772	0.130	Not Rejected
Total	**138.248**	**376**				

Table 5 shows the ANOVA value for the hypothesis of no significant difference on the perceived risk factors of anaemia in under-five children among mothers based on level of education (F-cal=14.772, df = 2, p = 0.130>.05). Since the p-value is greater than .05 level of significance at 2 degree of freedom, the hypothesis was therefore not rejected. This implies that there was no significant difference in the perceived risk factors of anaemia in under-five children among mothers in Owerri North LGA of Imo State based on level of education.

Discussion

The finding of the study in table 1 revealed that childbearing mothers in Owerri North Local Government Area agreed that low consumption of foods rich in iron, malabsorption of iron rich foods, deficiencies of nutrients such as folate, loss of appetite due to malaria, hookworm and whipworm infestation, HIV infection, poor feeding practices, lack of exclusive breastfeeding and poor antenatal visit during pregnancy are risk factors of anaemia in under-five children. The findings were expected and therefore not surprising because studies have consistently shown that the aforementioned are risk factors of anaemia in underfive children. The findings were in line with the findings of Belachew and Tewabe (2020) who reported that poor dietary diversity, food insecurity, not deworming, stunting and age less than two years are perceived risk factors of anaemia in under-five children. The findings agree with the findings of Kebede et al. (2021) who reported that intestinal-parasite infection, hookworm, family income and family size greater than five are risk factors of anaemia in underfive children. The findings were also in line with the findings of Fentaw, Belachew and Andargie (2022) who reported that having low dietary diversity score, inadequate exclusive breastfeeding, having history of diarrhoea and lowest family monthly income were factors associated with anaemia in under-five children.

The findings were consistent with Grantham-Mcgregor and Baker (2020) who reported that insufficient dietary iron, poor antenatal care visit, parasitic infections, breastfeeding status, frequency of complementary feeding per day, loss of appetite are risk factors of anaemia in underfive children. The findings of the study also agreed with Gebreegzibiher, Etana, and Niggusie (2014); Woldie, Kebede, and Tariku (2015); Alemayehu et al., (2018) who reported that risk factors of anaemia in under-five children were stunting, poor dietary diversity, food insecurity, timely initiation of complementary feeding, deworming, antenatal care visits, wasting among others. Furthermore, the finding agree with Ahmed (2019) who reported that deficiencies of micronutrients such as vitamins B12, folate and Vit. A, some diseases with blood loss and parasitic infections are risk factors of anaemia in under-five children. The findings are in line with Gebereselassie et al. (2020) who reported that feeding practice, nutritional practice, intestinal parasite, malaria, iron supplementation, deworming and dietary diversity are associated with anaemia in under-five children. Understanding these risk factors is crucial for developing targeted interventions to address anaemia in under-five children.

The study also revealed the perception of mothers on the risk factors of anaemia in under-five children. Results in Table 2 indicated that mother agreed on the perceived risk factors of anaemia in under-five children irrespective of their age; mothers 15-24years (x = 3.17), those within 25-34years (x = 3.32), mothers aged 35-44years (x = 3.43) while those 45years and above (x = 3.32). Findings in Table 4 revealed that there was a significant difference in the perceived risk factors of anaemia in under-five children CBMs in Owerri North Local Government Area. Childbearing mothers aged 35 -44years scored higher than others. The findings were not expected and therefore surprising because studies have consistently indicated that age of a mother is significantly associated with anaemia of under-five children. It is expected that the older a mother, together with the more number of children she has the more experience and understanding she will acquire about child rearing and their challenges. The finding contradicts with the findings of Grantham-Mcgregor and Baker-Henningham (2010) who reported that age of mother was significantly associated with anaemia of under-five children. Children born from older mothers were less likely to be anaemic compared to children from younger mothers. Also, the findings contradict the findings of Ahmed (2019) who reported that there was significant association between maternal age and anaemia of under-five children. As the maternal age increases, the mother probably will have more children and a better experience on child care and feeding. The

better the care and feeding practice a child gets the lesser risk of malnutrition. Also, the finding was not in line with the findings of Fentaw, Belachew, and Andergie (2022) who reported that maternal age greater than 30years of age was a risk factor of anaemia of under-five children.

The findings in Table 3 indicated mothers agreed on the perceived risk factors of anaemia in under-five children irrespective of their level of education: Findings in table 5 revealed that there was no significant difference in the perceived risk factors of anaemia in under-five children among CBMs in Owerri North Local Government Area based on level of education. The findings were not expected and therefore surprising because it is expected that mothers with higher level of education should have acquired more knowledge about child care practice and the nutritional needs of children as a result of their higher educational attainment. The findings contradict the findings of Joycelyne et al. (2014) who reported that maternal education is a strong predictor for nutritional outcome of children. The finding contradicts with the finding of Shatha (2019) who reported that education of mother was significantly associated with anaemia in under-five children. Children of mothers with non-formal education and primary education had anaemia more than those whose mothers had secondary and tertiary education. The finding was not in line with the findings of Habib et al. (2018) who reported that children of educated parents were less likely to develop anaemia than children of illiterate parents. Stressing further the authors pointed out that the lower odd of anaemia in the children of educated parents may be due to the fact that education improves knowledge about health care utilization and consumption of direct food for enhancing the nutritional status of their children.

The finding also contradicts the finding of Kaabi *et al.* (2023) who reported that mother's level of education was significantly correlated with the degree of anaemia in under-five children. The findings of this study can be linked to Health belief model which explains why individuals may accept or reject healthy behaviours. This implies that if mothers understand the consequences of anaemia in their under five children, they will take health-related steps to ensure they feed them with nutrients which are rich in iron and other micronutrients, practice exclusive breastfeeding and ensure adequate antenatal visit during pregnancy.

Conclusion

The findings have shown that childbearing mothers in Owerri North Local Government Area agreed on perceived risk factors of anaemia in under-five children. The mothers' age was an important risk factor of anaemia in under-five children while their education level was not.

Recommendations

Based on the findings and conclusions, the following recommendations were made:
1. Health care workers should educate mothers especially lactating mothers and those with children under-five years of age about good dietary practices and the benefit of exclusive breastfeeding.
2. Government should mount programmes that will help to distribute important supplements especially to children from poor homes .

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