

ASSESSING FACTORS ASSOCIATED WITH PREVALENCE OF ANEMIA AMONG CHILDREN UNDER FIVE YEARS OF AGE IN PAEDIATRIC WARD AT LIRA REGIONAL REFERRAL HOSPITAL. A DESCRIPTIVE CROSS-SECTIONAL STUDY.

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Abstract.

Background:

The objective aimed to assess factors associated with the prevalence of anaemia in children under five years of age and specifically to assess sociodemographic, evaluate the level of knowledge of caregivers and determine economic factors associated with anemia in the pediatric ward at LRRH.

Methodology:

A hospital-based descriptive and cross-sectional design was employed with both quantitative and qualitative data collection methods on a sample size of 96 participants.

Results:

The findings indicated the overall prevalence of anemia at LRRH to be 70.8% partitioned as follows; severe anemia at 34.38%, moderate anemia at 19.8%, and mild anemia at 16.67% with most affected age groups being 24-35 months with female gender constituting 86.4% while males' partners had only 13.5%, with majority coming from rural locality that is to say 60.4% compared to urban locality being 39.6%.

Conclusion:

Anemia prevalence at LRRH amounted to 70.8% and Sociodemographic findings showed mostly young mothers of 14-25 and 26-35 years had anemic children signifying early marriage, about knowledge about anemia, its causes, signs, and symptoms, it revealed majority of the people were familiar i.e. had prior knowledge about the condition and reported infections and fever as the main cause, most identifiable signs and symptoms as conjunctiva pallor, yellowish discoloration of the eyes and skin respectively and Economic findings showed most respondents had low income level (50%) leading to poorer provision of required food stuffs and low quality of living in their families.

Recommendations :

The GOU through MOH should support regular and routine conduct of prevalence surveys such as a study like this to keep track of its progress and also to invest more in developing its citizens through supporting various Sacco's within the villages through funding projects and donating grants to fight poverty.

Keywords: Anemia, Children under five, prevalence of anemia, lira regional referral hospital,

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1. Background of the study.

World Health Organization defines anemia in children aged under five (5) as a hemoglobin concentration <110 g/l at sea level and as being a serious global public health problem that particularly affects young children. WHO estimates that 42% of children less than 5 years of age are anemic (WHO, 2019).

For the diagnosis of anemia in children, WHO criteria for hemoglobin (Hb) threshold in different age groups were used and according to this, the hemoglobin threshold is 11.0 gm/dl for the age group of 1 month to 5 years and its severity is classified as severe anemia: Hb <7 gm/dl, Moderate anemia: Hb 7.0-8.9 gm/dl; and mild anemia: Hb 9.0-10.9 gm/dl.

Globally, about 42.6% of children are suffering from anemia and it affects a quarter of the world's population with children being at the greatest risk. There are very many causes of anemia and these include; malnutrition, insufficient hematopoiesis, blood loss, premature red blood cell, infection like malaria, and bone marrow destruction Children who live in Asia and Africa are at the greatest risk with almost two-thirds of children in Africa being anemic as results of the following factors; sociodemographic, economics and caretaker knowledge (Malako et al., 2018)

In Africa, the prevalence of anemia among preschool children is estimated at 64.6% s, however, community-based estimates of anemia prevalence among children in settings where malaria is endemic range from 49 to 76%. Childhood anemia is a preventable condition, which has serious consequences including growth retardation, poor immune system, and increased susceptibility to diseases and death, and has severe socio-economic consequences for families and communities (Kuziga et al., 2017)

A cross-sectional study on pooled household-level data from 27 SSA countries which included 96804 children aged 6-59 months in sub-Saharan

Africa (SSA), showed that the prevalence of anemia (defined as Hb <11 g/dl) across the region was 59.9%, ranging from 23.7% in Rwanda to 87.9% in Burkina Faso. In multivariable regression models, older age, female sex, greater wealth, fewer household members, older maternal age, high body mass index, current maternal pregnancy, and absence of recent fever were associated with higher Hb in tested children. Demographic, socioeconomic factors, family structure, and water/sanitation were associated with the presence of childhood anemia (Moschoviss PP et al., 2018)

In East Africa, anemia continues to be a serious public health problem, especially among children under 5 years of age and recent estimates from countries such as Tanzania and Kenya range from 20% - 56% in rural and urban areas.

Anemia is a critical health problem in Uganda with 53% of children being anemic and this has had a significant adverse effect on the country's economy. It is estimated to be the leading cause of mortality in children under five years.

Of recent, information sources from Lira regional referral hospital indicated that 999 children under the age of five years were admitted to the pediatric ward, and outpatient data reveals a total of 566 being anemic with a prevalence of anemia at 28%.

1.1. The general objective of the study

To assess the factors associated with the prevalence of anemia among children under five years of age in the pediatric ward at Lira Regional Referral Hospital.

1.2. Specific objectives

To assess sociodemographic factors associated with the prevalence of anemia among children under 5 years of age in the pediatrics ward at Lira regional referral Hospital.

To evaluate the level of knowledge of caregivers about anemia disease among children under 5 years of age in the pediatric ward at Lira Regional Referral Hospital.

To determine the economic factors associated with anemic among children under 5 years of age

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in the paediatrics ward at Lira regional referral Hospital.

2. METHODOLOGY

2.1. Study Design

. hospital-based descriptive cross-sectional design was used and it employed both quantitative and qualitative data collection methods to determine the factors associated with anemic among children under five years old age in the paediatric ward at Lira Regional Referral Hospital. This study design was preferred because it ensured that adequate data needed for the study was got within the shortest possible time as per the duration of the study indicated and also assisted in easily getting the required data for the study.

2.2. Study area

The study was conducted in the Pediatric Ward from December 2022 to March 2023, Lira Regional Referral Hospital which is located in Lira City situated in the northern part of Uganda, has a population of 99059 (2014 census). The hospital is one of the biggest health care providers in the Lango sub-region and it offers many health care services including immunization, child health services, obstetrics, and emergency care, HIV/AIDS management services, general patient management, laboratory services, mental health services, nutrition services, family planning services, antenatal and post-natal services, EMTCT program as well as RCT services among many others.

2.3. Study Population.

The targeted study population included all caretakers of children under 5 years of age having anemia and having been admitted to the Paediatric Ward, Lira Regional Referral Hospital for management. LRRH being a referral facility, the study population was expected to be a multilingual group speaking several languages including Acholi, Langi, Ateso, alur, etc. of which it was witnessed during the data collection process.

Further still, there was the composition of illiterate and literate individuals as well as having a variation in the wealth index/income level based on their economic status.

2.4. Sample size determination.

The sample size for the study was determined using the kish and Leslie sample standard formula given below, (Kish and Leslie,1965)

$$n = \frac{Z^2 pq}{e^2}$$

Where;

n= Desired sample size

Z=1.96, Corresponding to 95% confidence interval standard normal distribution curve

P=prevalence=50% because there was no documented prevalence in the hospital.

q=1-p

e=precision which was allowed error=10% OR

0.1

$$Q = 1 - P$$

$$= 1 - 0.5$$

$$= 0.5$$

$$n = \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.1 \times 0.1}$$

N =96 Participants

Therefore, a total of 96 individuals were recruited to take part in the study.

2.5. Sampling technique.

A simple random sampling procedure was employed to obtain the sample size needed for the study.

This gave an equal opportunity to every individual who meets the criteria a chance to be selected to participate in the study. All parents or guardians of children under five years of age suffering from anemia who consented to the study were recruited to take part.

It also worked best on a small and homogeneous population which was the case with the targeted population as per this study.

2.6. Sampling procedure.

All mothers and caretakers of anemic children under five years of age admitted at Lira Regional Referral Hospital during the study period were enrolled in the study using simple random sampling to ensure a great level of fairness in the study. Given that the study required a sample size of respondents, the researcher was first self-introduced to them who in turn took the initiative to educate

them about the purpose of the study and lastly got informed consent from the participants.

The researcher then got papers equivalent to the number of available respondents, on the paper, the word participate was written on the desired sample size and the remaining ones had the word don't participate; they were then folded and thoroughly mixed up in a container by shaking. A blindfold selection was then made by the respondents and those who picked a paper with the word participate were selected to take part and this was continuous until the desired sample size of 96 participants was attained.

The researcher used *langi* since most of the participants found it easier and more comfortable to express themselves as well sharing ideas and views about the problem of anemia.

2.7. Data collection method.

Data was collected by the researcher using Interview techniques i.e. face to face interaction as this offered an opportunity to probe further to get the exact intention of the clients, whereby mothers with children under five years were identified and consent taken from them.

2.8. Data collection tool(s).

A researcher-administered questionnaire containing both close-ended (structured) and open-ended (semi-structured) questions were used. This tool was selected because the study did involve a mixture of respondents some of which were literate and others illiterate thus unable to read, write and understand English that was used to develop the questionnaire. Secondly, open-ended questionnaires allowed the respondents to give unlimited responses, and deliver new and unexpected insights which were more detailed and relevant to the study.

It was designed based on the study objectives, available information on demographic characteristics, and knowledge-based, and economic status of the caretakers of anemic children under five years of age.

2.9. Data collection procedures.

The introductory letter from the school was presented to the office of the Director, LRRH to get consent and legal permission was granted after which, the medical director introduced the researcher to the in-charge pediatrics ward, who then in turn did the same to the respondents i.e. all caretakers and mothers of anemic children under five years of age. Respondents were assured of maximum confidentiality as only numbers instead of names were used to identify the respondents before approaching and collecting data from them. The study commenced after the objectives of the study had been well explained to participants and they had consented to participate in the study.

The researcher administered interview guides that were then issued to the caretakers of children under the age of five years at the pediatric ward, LRRH to enhance efficiency and confidentiality during data collection. The researcher hopes to sample 10 respondents per day.

2.10. Study variables.

This study employed both dependent and independent variables.

The dependent variable for the study was Anaemia among children under 5 years of age

The independent variables for the study included: maternal knowledge, Social demographic factors, and economic factors associated with anemia among children under 5 years.

2.11. Quality control.

The following quality control measures were taken to ensure the validity and reliability of collected data in the following ways;

A pilot study was carried out from Gulu Regional Referral Hospital a week before the start of actual data collection where a sample of 25 mothers coming for services was given questionnaires to answer accordingly to check the efficiency, suitability of the area for the study problem and to rectify any errors which might occur during actual data collection together with necessary modifications of the questionnaires and following this pretest, several questions which were inappropriately got phased out and other more relevant and

meaningful questions pertaining the study was substituted in to replace them.

it also aimed at ascertaining the relevance of the tool, to test the words of questions, clarity, and applicability of the tool to estimate the average time needed to fill in the questions.

Two research assistants underwent training sessions before the actual data collection and this was done by the researcher to ensure quality and consistency in the data collection process.

The questionnaires were interpreted by the interviewee in the language they understood best i.e. *langi* by the researcher and the trained research assistants (2) to maintain consistency and overcome the challenge of the language barrier.

The data collection took place from December 2022 to Feb 2023 i.e. 3 months to ensure adequate time needed to efficiently and effectively extract and get all the necessary information needed.

Researched administered questionnaires were cross-checked for consistency and completeness of the information obtained from the study participants.

All participants were encouraged to engage in the appropriate use of personal protective equipment like masks and routine hand washing with soap and water to prevent cross-infections spread from the researcher to caretakers and vice versa.

2.12. Inclusion criteria.

The study included all the caretakers of children under 5 years of age admitted in the Pediatric Ward, Lira Regional Referral Hospital who were free, willing, and voluntarily consented to participate in the study.

2.13. Exclusion criteria.

The children whose parents/guardians/caretakers did not consent to participate in the study were excluded. The study also excluded all children above five years of age and those who were critically ill.

2.14. Data analysis and presentation.

The collected data was first analyzed manually by the use of papers, pens, and tallying using scientific calculators, after which they were entered

in Microsoft Excel and then results were presented in form of tables, figures, graphs, or pie charts.

2.15. Ethical considerations.

An introductory letter obtained from the Medicare Health Professionals College research committee introduced the researcher to the hospital Director Lira Regional Referral Hospital to seek permission for conducting the study.

Written informed consent was obtained from each participant who was interested to participate in the study following explanations about the study purpose to each of them individually, the objectives and benefits of the study, and the fact that their participation was voluntary.

The participants were also informed of their right to refuse to enroll in the study and their right to withdraw from the study at any time without any repercussions.

The information collected was strictly used only for the study.

3. RESULTS.

3.1. Child's characteristics.

In table 1, in accordance with the research findings, out of 96 children under five years of age, most of them were males 64(66.7%) and only 32(33.3%) were females and the most affected age groups were those between 24-35 months having 31(32.3%), followed by ages 6-11 months and 48-59 month both at a percentage of 19.8%. The least affected children were between 36-47 months of age attaining 14.6%.

3.2. Prevalence of anemia among children under five years of age attending Lira Regional Referral Hospital.

The prevalence of anemia in children under five years of age attending paediatric ward at LRRH was found to be at 70.8%.

Further still on the study findings, a greater number of children had severe anemia Hb <7g/dl as it constituted 33(34.38%) followed by those with mild anemia at 16(16.67%) and those with moderate anemia at 19(19.8%) and lastly those without anemia at 30.21%. This implies boys were

Table 1: A Table showing child's characteristics distribution in terms of sex and age in months.

SEX	Frequency(N)	Percentage (%)
Male	64	66.7
Female	32	33.3
Age(Months)		
6-11	19	19.8
12-23	13	13.5
24-35	31	32.3
36-47	14	14.6
48-59	19	19.8

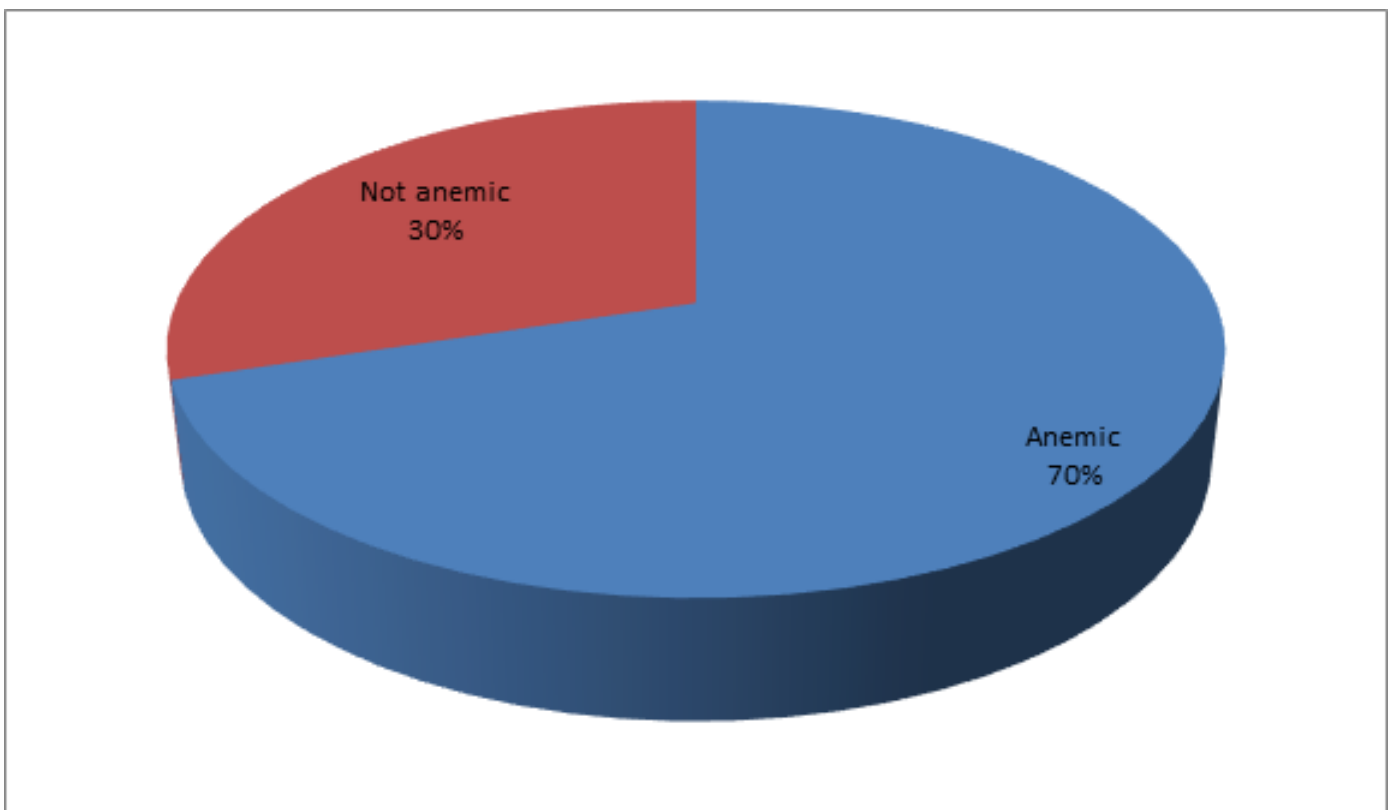


Figure 1: A pie chart showing the prevalence of anaemia in children under five years of age attending Lira Regional Referral Hospital.

Table 2: howing severity of anemia in children under five years of age at LRRH

Anemia	Frequency	Percentages
No anemia (Hb>11g/dl)	29	30.21
Mild anemia(Hb 10 to 10.9 g/dl)	16	16.67
Moderate anemia(Hb 7 to 9.9g/dl)	19	19.8
Severe anemia (<7g/dl)	33	34.38
TOTAL	96	100

more anemic than girls, and the most affected age group was 24-35 months having 31(32.3%) of which the majority had severe anemia of Hb < 7g/dl summing up to a prevalence of 70.8%.

3.3. Social demographic data of the respondents.

In table 3, the findings revealed that most of the participants in this study were females which constituted 83(86.4%) compared to their male counterparts who were only 13(13.5%). This signifies females have better health seeking behaviors and are more concerned about what happens around them than their male partners.

On the age factor, most of the respondents were in the range of 14-25 years and 26-35 years of age as they both had a tie of 31(32.3%) followed by ages 36-45 years 27(28.1%) then lastly those above 46 years 7(7.3%). This indicated early sexual activity and marriage involvement of most of these participants.

Further still, the study findings showed that most of the participants were married constituting 70(72.3%), followed by those who were single 19(19.8%) and those widowed were 7(7.3%), however there were no divorced cases.

Still the study findings pointed out clearly that those who attended primary only as their highest level of study constituted the highest number i.e. 64 (66.7%) ,followed by those who attended secondary school and those who never attended at all obtaining 13(13.5%) and lastly those who furthered study till tertiary level were very few composing just 6 people (6.3%). this implied that mostly affected children under five years of age had parents of low education background compared to those who managed to attain high level education.

On the occupation prospect, findings revealed most people were peasants with 76(79.2%), followed by those doing small-scale businesses 118(18.8%) and the participants who were housewives were 2(2.1%). this signifies that the vast number of these people engaged in farming as their major means of survival and day to day living.

The study findings also revealed that the dominant participants who constituted 39(40.6%) had 4-8 people living under their roof, followed by 32(33.3%) who had >8 people in their household and 25 participants came last with their household composing 1-4 people. This projected out clearly that majority of children with anemia came from families which had a large number of members and that also it was a sort of an extended family.

In a nutshell, the findings also showed that greater percentage of participants who had anemic children under five years of age were coming from rural locality as it constituted 58(60.4%) compared to their counter parts who were coming from urban locality being 38(39.6%).

3.4. Knowledge of the respondents about anemia.

Have you ever heard of anemia?

According to the study findings in figure 2, majority of the respondents 83(86%) reported to have ever heard about anemia compared to only 13(14%) who reported to have never heard about it. This reveals good level of knowledge amongst vast respondents as it showed anemia was never a new medical terminology to most of them since they had a prior hint on it.

In table 4, majority of the respondents 62(64.6%) reported having heard about anemia from a hospital setting followed by those who got opportunities to be told by their friends 17(17.7%), then from radio station 11(11.5%) and very few reported to have heard it from church 6(6.1%).

The data in the table 5 showed that the majority of the respondents mentioned infections specifically malaria as the cause of anemia and constituted 57(59.4%), followed by those who reported fever was a casual factor at 14(14.6%), poor nutrition 13(13.5%) then coming last were those who didn't have any idea on its cause 12(12.5%).

Also most participants were able to identify conjunctiva pallor as the most easily recognized sign of anemia and composed of 32(33.3%) followed by yellowish eyes and skin 25(26%) and

Table 3: A Table showing sociodemographic data of the respondents

Sociodemographic data		Frequency(N)	Percentage (%)
Gender	Female	83	86.4
	Male	13	13.5
Age(yrs.)	14-25	31	32.3
	26-35	31	32.3
	36-45	27	28.1
	46 and above	7	7.3
Respondents relation	Mother	83	86.5
	Father	13	13.5
Marital status	Single	19	19.8
	Married	70	72.3
	Divorced	0	0
	Widowed	7	7.3
Level of education	Primary only	64	66.7
	Secondary	13	13.5
	Tertiary	6	6.3
	Never attended	13	13.5
Occupation	Housewife	2	2.1
	Small scale business	18	18.8
	Peasant	76	79.2
	Others	0	0
Number of household members	1-4	25	26
	4-8	39	40.6
	>8	32	33.3
Area of residence	Rural	58	60.4
	Urban	38	39.6

Table 4: A Table showing places where respondents heard about anemia

Place	Frequency(N)	Percentage (%)
Radio station	11	11.5
Church	6	6.1
Hospital	62	64.6
Friends	17	17.7
Total	96	100

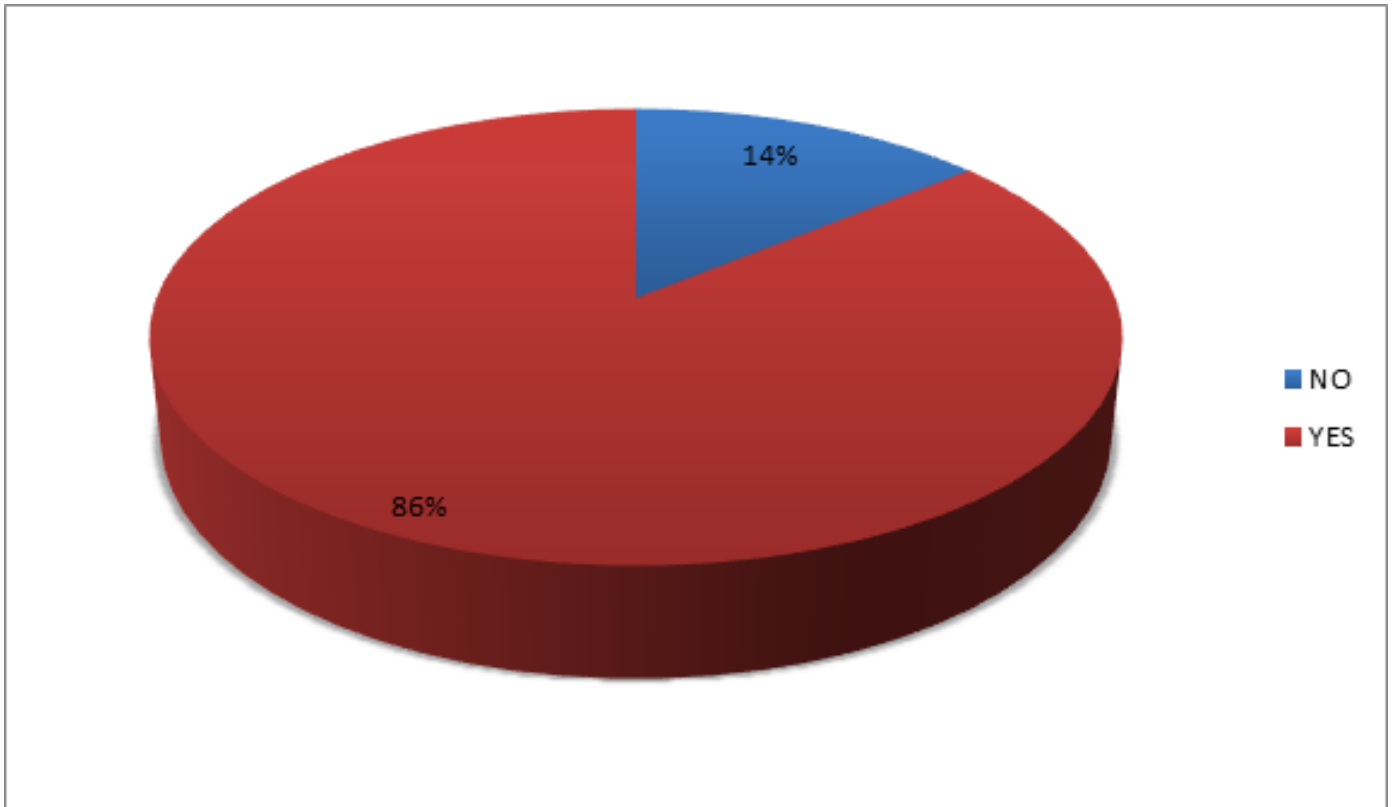


Figure 2: APie chart showing Knowledge of the mothers about anemia

Table 5: A table showing respondents knowledge on the causes of anemia, its signs and symptoms

Causes	Frequency(n)	Percentage (%)
Poor nutrition	13	13.5
Infection	57	59.4
No idea	12	12.5
Others(fever)	14	14.6
Signs and symptoms		
Conjunctiva pallor	32	33.3
Loss of weight	0	0
Difficulty in breathing	7	7.3
Yellowish eyes and skin	25	26
Others		
Fever	19	19.8
Vomiting	13	13.5
TOTAL	96	100

fever 19(19.8%), vomiting 13(13%) and lastly difficulty in breathing seconded by 7(7.3%). This signified that the most mentioned causes of anemia were infections, fever respectively and the 3 leading signs and symptoms that were mentioned included conjunctiva pallor and yellowish eyes and skin and fever indicating moderate level of knowledge on the causes and signs and symptoms of anemia.

According to the findings in table 6, respondent's knowledge on the prevention of anemia in children under five years of age revealed that majority reported adequate nutrition 49(51.04%), those who said treating infection were 15(15.6%), followed by regular deworming 13(13.5%), exclusive breastfeeding 10(10.4%) and sleeping under mosquito net 9(9.4%). This signified moderate knowledge of respondents on the preventive measures of anemia in their children.

In a nutshell, pertaining the general level of knowledge exhibited by respondents on anemia, the correct scores for the five questions were taken into consideration as follows;

Those who excelled in answering all 5 questions correctly were classified as having high level knowledge, those who answered three questions and above correctly as possessing moderate knowledge and those who could only afford 2 questions correctly were termed as having low level of knowledge. Based on the study findings with the foundational basis as per the above classification, those who had high level knowledge attained 25%, moderate knowledge 45% and low level of knowledge 30%.

3.5. Economic Status of Respondents.

In line with the research results, greater number of participants ate twice a day as they were 74(77%), followed by those who could afford to have three meals a day at 17% and lastly people who only managed to eat once a day at 6%. This shows majority of respondents didn't have enough money to enable them afford all the normal three meals i.e. breakfast, lunch and supper.

In accordance to the study findings in figure 4, it showed that majority of respondents that is to say 83(86%) didn't have access to food

throughout the year compared to their counterparts who constituted 13(14%). This reveals that most households had food insecurity.

In table 7, out of 96 participants who took part in the study, majority of them which constituted 58(60%) reported they didn't have enough money to buy food for their families followed by those who said the food shortage was due to bad weather 32(33%) and then having a large family was stated by 6(7%). The two most important causes of shortage of food that were stated included no enough money to buy it and bad weather i.e. infrequent rain and scorching sunshine on the crops.

In table 8, following the interview of 96 respondents, the revealed information indicated that majority of them ate cassava, beans and fruits and vegetables as this constituted the biggest percentage i.e. 19(19.8%), followed by those who ate sweet potato at 14(14.6%) then meat at 13(13.5%), with those who mentioned millet composed 10(10.4%). This shows the most indigenous foods consumed by the people are cassava, beans and fruits and vegetables.

In summary, the economic classification was based on per capita daily expenditure or consumption that is to say, the amount of income used by the family in one day as follows; those who had per capita daily consumption less than 15,000 ugsh were classified as low level income and those with per capita daily consumption ranging from 15,000 to 80,000 ugsh were categorized as middle/moderate income and those fitting per capita daily consumption of greater than 80,000 ugsh were grouped as high level income.

Conclusively on the study findings with reference to the above classification, it showed that 50% had low level income, middle level income were 30% and high level income at 15%.

4. Discussions.

The findings of the study are discussed as per the prevalence of anemia in children under five years of age at LRRH and then systematically according to specific objectives of the study i.e. sociodemographic factors associated with preva-

Table 6: A table showing respondents knowledge on how anemia can be prevented

Preventive measure	Frequency(N)	Percentage (%)	
Exclusive breastfeeding	10	10.4	
Regular deworming	13	13.5	
Adequate nutrition	49	51.04	
others	Sleeping under the net	9	9.4
	Treating infection	15	15.6
Total	96	100	

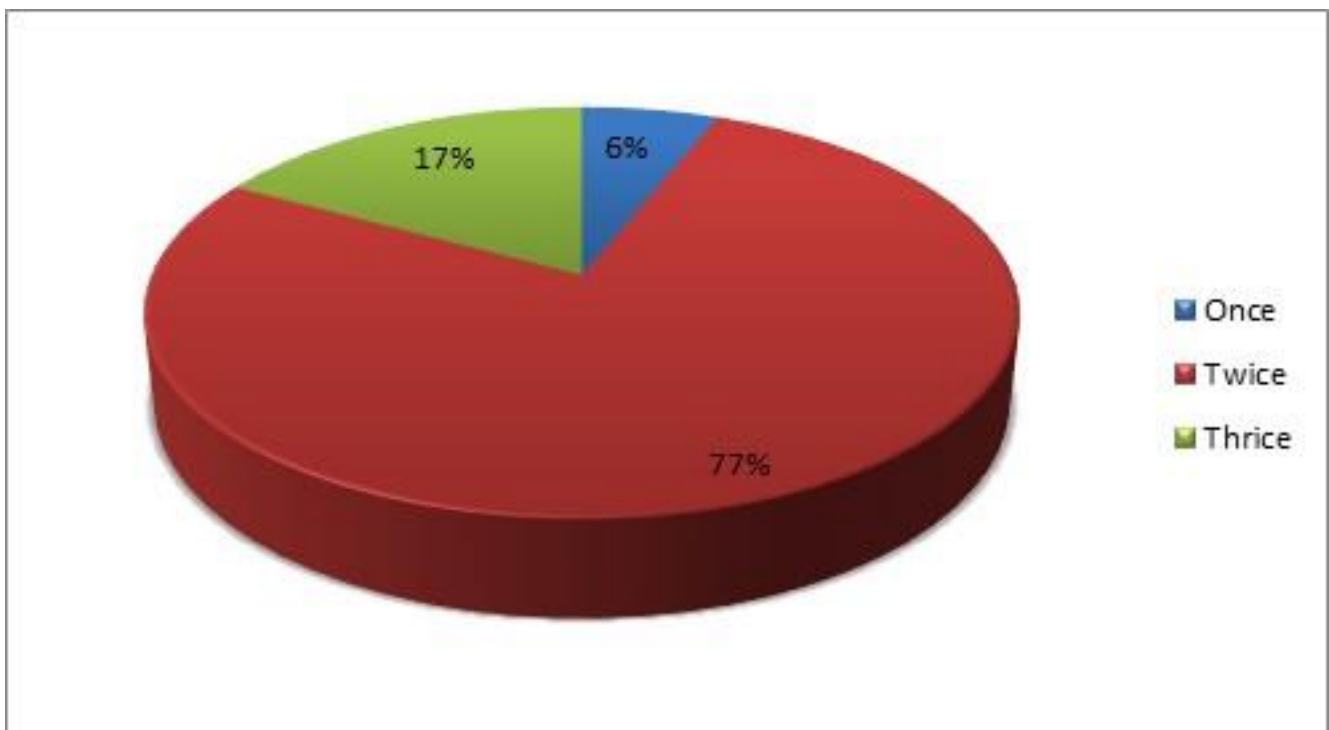


Figure 3: A Pie chart showing the number of meals had in a day by the respondents

Table 7: A table showing causes shortage of food in your family

Causes	Frequency(N)	Percentage (%)
Bad weather	32	33
No money to buy	58	60
Having a large family	6	7
Total	96	100

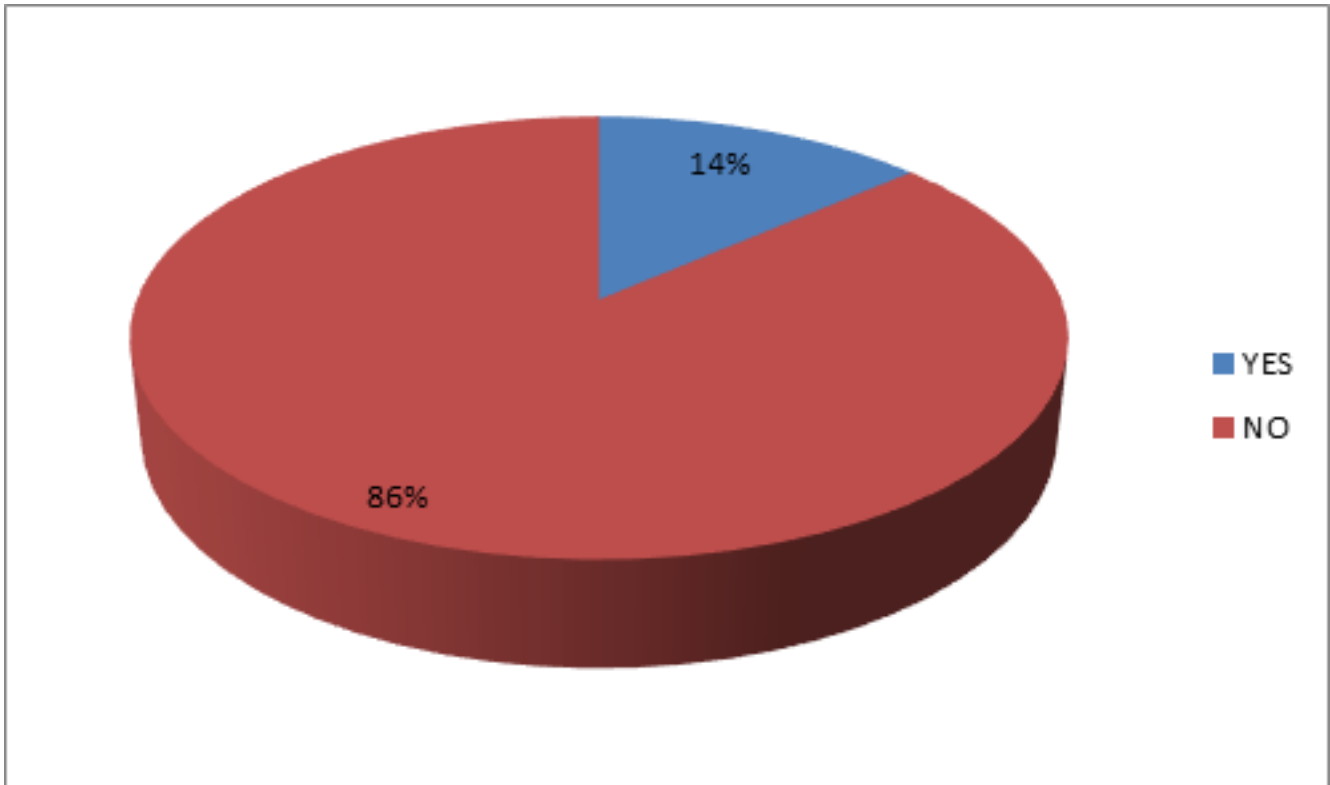


Figure 4: A Pie chart showing extent of respondent's access to enough food throughout the year.

Table 8: A Table showing the various types of meals the respondent's ate

Type of meal	Frequency(N)	Percentage (%)
Cassava	19	19.8
Sweet potato	14	14.6
Beans	19	19.8
Millet	10	10.4
Meat	13	13.5
Fruits and vegetables	19	19.8

lence of anemia, level of knowledge of caregivers, and economic factors associated with anemia.

4.1. Prevalence extent of anemia in children under five years of age at Lira Regional Referral Hospital.

The study findings revealed that out of 96 sample size of children under five years of age, the overall prevalence of anemia was at 70.8% with a greater number of children having severe anemia Hb <7 g/dl at (34.38%) followed by those with moderate anemia (19.8%) and mild anemia composed (16.67%). In comparison, according to

Uganda Demographic and Health Survey (2016), it was recorded that 53% of the children aged between 6 to 59 Months suffered from some degree of anemia and thus the prevalence obtained from this study indicated a higher prevalence of 70.8%. However, still in another study done by Kuziga and collaborators, in the Namutumba district in Uganda in 2017, found that 58.8% of the children were anemic. The increased prevalence realized in this study shows that anemia is still one of the top concerns and health challenges encountered at LRRH and further reveals its magnitude in Lira City as well as the entire Lango sub-region

at large and this could probably be due to a variety of factors of which some are discussed below as per the findings from the results in terms of sociodemographic, knowledge and economic status of the respondents.

4.2. Sociodemographic factors associated with the prevalence of anemia in children under five years of age.

The study findings showed that most of the respondents were in the range of 14-25 years and 26-35 years of age as they both had a tie of 31 (32.3%) followed by ages 36-45 years 27 (28.1%) then lastly those above 46 years 7 (7.3%). This indicated early sexual activity and marriage involvement of most of these participants and this could be probably due to the poor cultural practice of marrying off girls at a tender age due with the aim of gaining wealth. This finding agrees with a study carried out in India by P. Paul et al., (2019) aimed to examine the association between child marriage, and anemia in children aged below 5 years that included 80539 children born to 60003 ever-married women aged 15-24 years revealed that 58% of sample women were married before 18 years of age and more than half of the sample children were anemic.

The study findings also showed that the largest percentage of respondents attended primary only as their highest level of study 64 (66.7%), followed by those who attended secondary school and those who never attended at all obtaining 13 (13.5%) and lastly, those who furthered study till tertiary level were very few composing just 6 people (6.3%). This implied that most anemic children under five years of age had parents of low education background compared to those who managed to attain high-level education and this could probably be due to poor attitude of people towards educating girl child as they are viewed more as source of wealth. This result is in line with a cross-sectional conducted at Gugufu Health Center among 404 children aged 6 to 59 months of age by Gebreweld A et al., (2019) to determine the prevalence of anemia and its associated factors which showed that the overall prevalence of anemia was 41.1% and children whose mothers had

no formal education (AOR=7.05 95% CL: 2.93-17.01) and primary education were more likely to be anemic.

The study findings also revealed that the dominant participants who constituted 39 (40.6%) had 4-8 people living under their roof, followed by 32 (33.3%) who had >8 people in their household, and 25 participants came last with their household composing 1-4 people. This indicated clearly that the majority of children with anemia came from large families which had at least 4 members and also sort of an extended family and probably this could have been a result of poor embracement of family planning and contraceptive methods by the majority of people. This finding, however, is in close agreement with another study carried out in sub-Saharan Africa by Tesema GA et al., (2021) on 135619 children aged 6-59 months aimed to determine the prevalence and determinants of anemia which had revealed that the level of anemia among children from a family size of 5-8 and >8 were 1.04 times [AOR=1.04, 95%, CI; 1.01, 1.06], 1.13 times higher than children from the family size of fewer than 5 members respectively.

The study findings showed that the majority of participants who had anemic children under five years of age were coming from the rural locality as it constituted 58 (60.4%) compared to their counterparts from urban localities 38 (39.6%). This implied most respondents were coming from remote areas where there is inadequate exposure and probably due to the low standards of living of these parents which puts the children at risk of infections this is in line with another study carried out by Al-Kassab-Cordova A et al., (2022) among Peruvian children aged 6-59 months in Peru where a sample of 18846 children aged 6-59 months which revealed that majority of those anemic children were from rural areas 38.25%, and in urban areas was 26.39%.

4.3. Knowledge of respondents about anemia.

The research findings revealed that the overall prevalence of anemia in children under five years of age is at 70.8% as follows; mild at 16.67%, moderate at 19.8%, and severe at 34.38% which signi-

fied respondent's low level of knowledge which was at 30% towards prevention of anemia. This partly could be due to the low level of sensitization and inadequate health education about this condition by the responsible authorities. Though the finding is greater, its somehow in agreement with a similar hospital-based analytical study conducted in Zanzibar, Tanzania by Arafat Hassan et al., (2022) to determine the knowledge and practice towards prevention of anemia which had 594 caregivers and their children under-fives, revealed that the overall prevalence of anemia among under-fives was 69.1%, 43.8%, 22.9%, and 2.4% of the under-fives had mild, moderate, and severe anemia, respectively with Caregivers' knowledge at 36.7% signifying low-level knowledge towards prevention of anemia.

The study findings on respondents' knowledge, also revealed that major signs of anemia identified were; conjunctiva pallor composing 32(33.3%) followed by yellowish eyes and skin 25(26%), fever 19(19.8%), vomiting 13(13%) and lastly difficulty in breathing seconded by 7(7.3%) and this, therefore, demonstrates the moderate level of knowledge by most respondents which could probably be due to adequate exposure as a result of recurrence of hospitalization of these children with anemia. This result is however in close agreement with a similar study conducted in Mkuranga District Hospital, Tanzania to ascertain mothers' knowledge, and of the causes of anemia and its signs by Ngimbudzi et al., (2016) which showed that the major signs and symptoms of anemia identified as known by the mothers included a range of early (i.e., conjunctiva and palmar pallor) to late (i.e., difficulty breathing and loss of weight).

According to the study findings, respondents' knowledge of the prevention of anemia in children under five years of age revealed that the majority reported adequate nutrition 49(51.04%), those who said treating infection were 15(15.6%), followed by regular deworming 13(13.5%) and exclusive breastfeeding 10(10.4%). This signified a moderate level of knowledge of respondents on the preventive measures of anemia in their children probably due to the extension of health educa-

tion by health workers and responsible personnel. These findings were almost in line with a study carried out in Ghana by Anokye et al., (2018) on the perception of childhood anemia among mothers which showed that out of 228 patients attending the university hospital in Kumasi, almost one-fourth (23%) of them viewed that anemia could be prevented by giving adequate nutrition, giving the child enough water (14%) as well as regular deworming (19%) with exactly one-fourth (25%), suggested that exclusive breastfeeding can prevent anemia.

By results, the majority of the respondents 62(64.6%) had heard about anemia from a hospital setting followed by those who got opportunities to be told by their friends 17(17.7%), then from the radio station 11(11.5%), and thus this the primary source of knowledge on anemia is got from the health setting the as well low level of sensitization through mass media probably due to frequent hospitalization and giving less prioritization to discuss such matter at this particular level respectively. This is however in line with a study conducted in Mkuranga District Hospital, Tanzania by Ngimbudzi et al., (2016) which showed a slight majority of participants (n = 22; 55%) acknowledged prior knowledge of anemia, with the majority (n = 32; 82%) reporting the main source of this information as the Reproductive and Child Health (RCH) programs and services.

Following the research findings, it showed that the majority of the respondents mentioned infections specifically malaria as the main cause of anemia and it constituted 57(59.4%), followed by those who reported fever 14(14.6%), and poor nutrition 13(13.5%). This means most participants were able to come up with the correct causal factor as being infection thus indicating average knowledge and this is in agreement with a study done at Mkuranga District Hospital, Tanzania on knowledge of mothers which indicated that most frequently reported causes of anemia included frequent illness (Ngimbudzi et al., 2016)

The study findings reveal the three (3) top leading signs and symptoms that were mentioned by participants including conjunctiva pallor, yellowish eyes and skin, and fever. This indicates gen-

erally

good knowledge of caregivers about anemic features probably due to exposure to health facility settings following many hospitalizations due to this condition in that they had an opportunity to be passed on the health education. however, this is in contrast with a study done by the International Journal of Endorsing Science Research, aimed at assessing maternal nutritional knowledge and its associations with iron deficiency anemia by Ismail & Fatima,(2014) indicated that the signs and symptoms were reported by mothers proved that all the anemic children had pica and sore tongue.

4.4. The economic status of the respondents.

According to the research findings, it showed that the majority of respondents had a low-income level composing 50%, followed by those that had moderate/middle income 30% and the fewest 15% had high-level income. This implied that the majority of the affected children with anemia were coming from communities and families of low economic status compared to their counterparts from high-income status as they had very few respondents. This indicates the extent of the biting poverty among the major citizens which could probably be due to poor wealth distribution among the general country's population i.e. the so-called "privileged" rich" and unprivileged "poor". This therefore had a similar finding following a study conducted in Ethiopia by Gebremeskel MG et al., (2020) to determine factors associated with anemia among children aged 6-23months showed that the prevalence of anemia among children 6-59months of age was 57% with community-level factors revealing that low community poverty is a protective factor for anemia as the odds of anemia were 0.81 times lower for children who were living in communities of lower poverty status than children who were living in communities of higher poverty status.

Out of 96 participants who took part in the study, a vast number 58(60%) reported they didn't have enough money to buy food for their families followed by those who reported the food

shortage was due to bad weather 32(33%). The key causes of the shortage of food stated include; not enough money and bad weather which not only increase the risk of anemia but also have an interpretation of low economic status which could be due to unemployment which keeps the pool of money low and unpredictable weather changes in terms of rainy and dry seasons respectively. These findings, therefore, are in line with another study conducted in NAMIBIA by Shimanda, P.P., Amukago, H.J., &Norstrom, F.(2020) about socioeconomic factors associated with anemia among children aged 6-59months of age and a total of 1383 children aged 6-59months of age which indicated that there was a statistically significantly increased risk of anemia among children from poorer household with 46.9% compared with richest quantile which had 33.5%.

In line still, with the research results, the majority reported having meals twice a day 74(77%), followed by those who could afford to have three meals a day at 17%, and lastly, people who only managed to eat once a day at 6%. This shows the majority of respondents didn't have enough money "poor" to enable them to afford the normal three meals that are to say breakfast, lunch, and supper which greatly hampers the nutritional content of children and probably it could result in an unsustainable source of income which denies them a chance to live a great life with their families and this is in harmony with another study conducted in Ghana, by Shenton, L.M, et al., (2020) about factors associated with anemia status among children which involved a sample of 7739 households which revealed that children under five years of age who were from poorer families had greater odds of being severe to moderately anemic i.e. children in the richest quantile had 0.33 times the odds severe-moderate anemia compared to children in the poorest wealth quantile.

The study findings showed that the majority of respondents 83(86%) didn't have access to food throughout the year compared to their counterparts who constituted 13(14%). This indicates that most households with anemic children had food insecurity thus a positive correlation which probably could be attributed to

bad weather in terms of unpredictable change of seasons and low-income sources and this is in agreement with a cross-sectional study published by Cambridge university press by SMoradi et al.,(2018) about food insecurity and anemia risk revealed that there was a positive relationship between food insecurity and anemia risk(OR=1.27;95% Cl 1.13,1.40) and also similar results were observed for iron deficiency anemia(OR=1.45;95%Cl1.04,1.86) where it revealed that mild and moderate food insecurity, increased the risk of anemia in infants/ toddlers.

Based on the study findings, showed that the majority of respondents 83(86%) didn't have access to food throughout the year compared to their counterparts who constituted 13(14%). This reveals that most households had food insecurity which is in disagreement with another study conducted about household food insecurity and early childhoods iron deficiency by Salarkia, N et al.,(2015) from the International Journal of preventive medicine which had 423 mother-child pairs as participants stated that there was no significant association between household food insecurity with or without anemia in that 47.7% of the households were food secure. Mild and moderate-severe household food security was 39.5% and 12.8%, respectively.

According to the research findings, it shows that the dominant respondents had low income composing 85%, followed by those that had a moderate income 13% and the fewest i.e. 2% had a high income. This implied that the majority of the affected children with moderate to severe anemia were coming from families of low economic status compared to those from high-income status which demonstrated a

similar findings from another study conducted in 27 sub-Saharan countries among 251928 children aged 6-59 months by Moschovis PP et al., (2018) revealed that, on average, children with anemia were living in low-income households thus in conclusion, socioeconomic factors were greatly associated with anemia and responsible for 67.8% of the burden of childhood anemia in that 23.6% had mild anemia, 34.4% had moderate and 3.39% had severe anemia.

5. Conclusion.

The study was conducted to determine the sociodemographic, knowledge and economic factors associated with the prevalence of anemia in children under five years of age at LRRH, and the following conclusions were made;

Out of 96 sample size of children under five years of age, the results indicated the overall prevalence of anemia is 70.8% as follows; severe anemia 33 (34.38%), moderate anemia 19(19.8 %), and those with mild anemia composed 16(16.67%) and this poses a huge threat to the whole general health sector and the government due to its associated high levels of mortality rate.

Based on the sociodemographic factors; the study findings indicated that most attendants were females compared to their male partners meaning females are more concerned about what goes on around them and what affects the quality of life of their children and most mothers with anemic children were in the range of 14-25 years and 26-35 years of age indicating early sexual involvement as well early marriages.

It also showed a majority of the respondents had 4-8 people living in their households which means a great number of people residing in one household other members claimed due to large number was a cause of food shortage to some extent in their families.

On the level of education, most affected children with anemia had parents who attained primary level as their highest level of education, followed by those who didn't attend school at all.

Following the evaluation of the level of knowledge of respondents about anemia, its causes, signs, and symptoms, and then the preventive measures, it showed a majority of the people were familiar that is to say, had prior knowledge about the condition and the major source of information on it was got from a hospital setting, a lot of respondents could mention infections and fever as the major causes of anemia in children under five years of age respectively and the most identifiable signs and symptoms of anemia by respondents included conjunctiva pallor, yellowish discoloration of the eyes and skin, fever, vomiting,

and difficult breathing respectively. This, therefore, demonstrated a moderate level of knowledge of the participants on this prospect.

On the preventive measures, the majority of respondents reported adequate nutrition, treating infections, regular deworming, and exclusive breastfeeding respectively and thus this showed a moderate level of knowledge.

On the economic factors contributing to anemia among children less than 5 years, most respondents purchased their food and since most were not involved in other income-generating activities, it would lead to poorer provision of required food stuffs needed by their families.

6. Recommendations.

The increasing prevalence of anemia should be addressed as a team to reduce it as it requires efforts from all sectors that partner together to ensure the well-being of the children and their families.

The GOU should empower women through directly organizing beneficiary programs that suit and perfect them in terms of a financial boost, inspirational advocates since they are more cautious about their families and everyone who stays around them as well as reenergizing its campaigns against early girl-child marriages by implementing strict policies on such individuals who take part in such acts.

The GOU through MOH should emphasize more on family planning methods and other contraceptive use through the allocation of more resources towards funding this program to enable families to regulate the number of children they would love to have and take good care of.

More radical interventions should be made by the Government and appropriate authorized personnel on eradicating illiteracy more so prioritizing girl child education as higher levels of education were found to be associated with low levels of anemia in children.

The MOH directly through trained health workers should come up with appropriate strategies to enable the caretakers to translate the high levels of knowledge they have on anemia and

its causes into adequate and protective practices which solely prevent other than trying to cure the condition anemia such as ensuring that children eat a balanced diet every day especially those foods which enhance blood formation as well as improving Child's immunity, fully breastfed and food security is ensured at most times. Further still, health workers should teach mothers the danger signs as well as early obvious clinical signs and symptoms of anemia such as yellowing of mucous membranes as well as early identification and treatment of infections like malaria which predisposes to anemia.

The government of Uganda should invest in developing its citizens through supporting various Sacco's within the village levels by funding their projects and donating grants to fight and eradicate the biting poverty which is identified as one major factor contributing immensely towards anemia existence within children and also encourage them to get involved in more income generating activities as this helps to ensure that they can purchase recommended food items as well as ensuring food security in their households throughout the entire year.

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8. Abbreviations.

AIDS : Acquired Immune Deficiency Syndrome.
FAO : Food and Agriculture Organization.
Hb : Hemoglobin.
IDA : Iron Deficiency Anemia.
MOH : Ministry Of Health.
PEM:Protein Energy Malnutrition.
SES : Socioeconomic Status.
SSA : Sub-Saharan Africa.
UAHEB : Uganda Allied Health Examination Board.
UBOS : Uganda Bureau of Statistics.
UDHS : Uganda Demographic and Health Survey.
UN : United Nations.
USAID : United States Agency For International Development.
WHO : World Health Organization.
LRRH : Lira Regional Referral Hospital
GOU ; Government Of Uganda

9. References.

1. Anokye, R., Acheampong, E., Edusei, A.K. et al. (2018), Perception of childhood anaemia among mothers in Kumasi: a quantitative approach. <https://doi.org/10.1186/s13052-018-0588-4>
2. Arafat Hassan KhatibabAngelina A.Johobknowledge. (2022), practice and attitude towards its prevention among under-fives in Zanzibar, Tanzania
3. Evelyine B. Ngimbudzi, Alice M. Lukumay, Agnes W. Muriithi, Khairunnisa A. Dhamani, Pammla M. Petrucka.(2016), "Mothers' Knowledge, Beliefs, and Practices on Causes and Prevention of Anaemia in Children Aged 6 - 59 Months: A Case Study at Mkuranga District Hospital, Tanzania" published by Open Journal of Nursing, Vol.6 No.4, 2016
4. Gebrehaweria Gebremeskel M, Lemma Tirore L. (2020), Factors Associated with Anemia Among Children 6-23 Months of Age in Ethiopia: A Multilevel Analysis of Data from the 2016 Ethiopia Demographic and Health Survey. *Pediatric Health Med Ther.* Sep 16;11:347-357. doi: 10.2147/PHMT.S258114. PMID: 32982542; PMCID: PMC7508559.
5. Gebreweld, A., Ali, N., Ali, R., & Fisha, T. (2019), Prevalence of anemia and its associated factors among children under five years of age attending at Gugufu health center, South Wollo, Northeast..Ethiopia. *PloSone*, 14 (7),e0218961.<https://doi.org/10.1371/journal.pone.0218961>
6. Ismail, A., & Fatima, F. (2014). Maternal nutritional knowledge and its association with iron deficiency anemia in children.
7. Kuziga, F., Adoke, Y. & Wanyenze, R.K.(2017). Prevalence and factors associated with anaemia among children aged 6 to 59 months in Namutumba district, Uganda: a cross-sectional study <https://doi.org/10.1186/s12887-017-0782>.
8. Malako, B.G., Teshome, M.S. & Belachew, T. (2018).Anemia and associated factors among children aged 6–23 months in Damot Sore District, Wolaita Zone, South Ethiopia. *BMC Hematol* 18, 14 (2018). <https://doi.org/10.1186/s12878-018-0108-1>.
9. Moradi, S., Arghavani, H., Issah, A., Mohammadi, H., & Mirzaei, K. (2018), Food insecurity and anaemia risk: a systematic review and meta-analysis. *Public health nutrition*, 21 (16), 3067–3079. <https://doi.org/10.1017/S1368980018001775>.
10. Moschovis PP, Wiens MO, Arlington L, Antsygina O, Hayden D, Dzik W, Kiwanuka JP, Christiani DC, Hibberd PL.(2018). Individual, maternal and household risk factors for anaemia among young children in sub-Saharan Africa: a cross-sectional study. *BMJ Open*.doi: 10.1136/bmjopen-2017-019654. PMID: 29764873; PMCID: PMC5961577.
11. Paul, P., Chouhan, P., & Zaveri, A. (2019). Impact of child marriage on nutritional status and anaemia of children under 5 years of age: empirical evidence from India. *Public*

health, 177, 95–101. <https://doi.org/10.1016/j.puhe.2019.08.008>.

12. Salarkia Nahid, Neyestani Tirang R, Omidvar Nasrin, Zayeri Farid.(2015),Household food insecurity, mother's feeding practices, and the early childhood's iron statusYear : | Volume : 6 | Issue : 1 | Page : 86DOI: 10.4103/2008-7802.164414.
13. Shenton, L. M., Jones, A. D., & Wilson, M. L. (2020), Factors Associated with Anemia Status Among Children Aged 6-59 months in Ghana, 2003-2014. *Maternal and child health journal*, 24 (4), 483–502. <https://doi.org/10.1007/s10995-019-02865-7>.
14. Shimanda, P. P., Amukugo, H. J., & Norström, F. (2020). Socioeconomic factors associated with anemia among children aged 6-59 months in Namibia. *Journal of public health in Africa*, 11 (1), 1131. <https://doi.org/10.4081/jphia.2020.1131>.
15. Tesema GA,Worku MG,Tessema ZT, Teshale AB,Alem AZ,Yeshaw Y,et al.(2021) prevalence and determinants of severity levels of anemia among children aged 6-59months in sub-Saharan Africa:A multilevel ordinal logistic regression analysis.PLoS ONE 16(4):e0249978 doi:10.1371/journal.pone.0249978
16. WHO (2019) Anemia in Clinical Practice- Definition and Classification - PubMed<https://pubmed.ncbi.nlm.nih.gov> >

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