

Factors contributing to increased cases of malnutrition among children below five years in Nyumanzi Refugee Settlement, Adjumani District.

A cross-sectional study.

Caroline Mazira*, Nabukenya Sharifah, Prosper Mubangizi
Kampala school of health sciences

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Abstract

Background:

Globally, close to 45.4 million deaths among children under 5 years of age are linked to undernutrition. The aim of the study is to assess the factors contributing to increased cases of malnutrition among children below five years in Nyumanzi refugee settlement, Adjumani district.

Methodology:

Cross-sectional study using a quantitative research approach. Simple random sampling was used to select the 60 respondents. Calculators and manual coding were used for data analysis, and the data were presented in the form of tables, bar graphs, and pie charts.

Results:

(75%) Their children were in the age group (1-3 years); the majority of the respondents (66.7%) had female Children (50%) who were Dinka by tribe; (66.7%) had children who weighed < 18.5 kg. Socio-economic factors contributing to increased cases of malnutrition were Large family size (91.7%), increased poverty levels (83.3%), inadequate meals (58.3%), and inadequate access to safe water (53.3%). The environmental factors contributing to increased cases of malnutrition among children below five years were inadequate access to safe water (53.3%), inadequate access to land for agriculture (96.7%), and poor hygiene practices (75%). Health-related factors contributing to increased cases of malnutrition were poor exclusive breastfeeding practices (87%), poor health-seeking behaviour (53.3%), partial immunization practices (62%), and persistent illnesses (50%) in children.

Conclusion:

Family size, poverty, inadequate access to land for agriculture, poor hygiene, inadequate exclusive breastfeeding practices, poor health-seeking behaviour, partial immunization practices, and persistent illnesses were the major factors contributing to increased cases of malnutrition among children below five years.

Recommendations:

Community health workers should intensively conduct health education programs and monitoring to address poor hygiene, safe storage of drinking water, and routine nutritional assessment for children below five years.

Keywords: Factors, Increased cases of malnutrition, Children below five years, Nyumanzi refugee settlement.

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Corresponding author: Caroline Mazira

Kampala school of health sciences

Background

Undernutrition makes children much more vulnerable to diseases and even death. Globally, close to 45.4 million deaths among children under 5 years of age are linked to undernutrition, and many of the victims are in developing countries. The medical, social, economic, and developmental effects of the global undernutrition burden are lasting and serious for individuals and their families, communities, and countries due to its complex and dynamic nature. The burden and developmental effects of undernutrition are not uniform worldwide. Countries with

greater prevalence are faced with greater burden as well. For example, of the 144 million of the world's stunted under-five children, about 94% are in Asia and Africa alone, while only about 6% are distributed within the rest of the regions of the globe (WHO, 2023).

In 2020, 149.2 million children under five were stunted, and 45.4 million suffered from wasting. Meanwhile, the number of children under five affected by overweight worldwide increased from 33.3 million in 2000 to 38.9 million in 2020. Middle East & North Africa had the highest overweight prevalence in 2020, with 12.0 per cent affected, followed by

North America at 9.1 per cent, Eastern Europe and Central Asia at 8.7 per cent (UNICEF, 2022).

The World Health Organization (WHO) and UNICEF are working together to develop guidance to help policy-makers, health workers, and program managers implement action plans to address malnutrition. UNICEF has also launched the Child Nutrition Fund (CNF) to incentivize domestic investments to end child malnutrition. Uganda is among the countries in East Africa with high levels of undernutrition, whereby about 29 percent, or 3 in 10 children below 5 years of age, are stunted, while about 3.5% of all children below 5 years of age in Uganda are faced with body wasting (UBOS, 2022).

Uganda, as a country, and particularly Adjumani in north western part of the country, has faced malnutrition challenges. Several studies and interventions have been carried out by both the government and Non-Governmental Organizations (NGO's), but despite all these, there is still an increase in malnutrition, particularly in the conflict-ravaged Northern Uganda, including Adjumani. By 2012, the total population of Uganda was 33.6 million people, with children under five years estimated to be 6.5 million. Stunting among children under 5 years by 2011 was 38%, and underweight was 14% (USAID-DHS, 2018). However, the relationship between socioeconomic and demographic factors and malnutrition has not been fully studied in Adjumani District. Therefore, the study focused on digging deep into gaps in factors contributing to increased cases of malnutrition in Nyumazi refugee settlement camp in Adjumani District.

Methodology

Study design

A cross-sectional study design was used based on time, whereby a quantitative research approach was adopted. This is an appropriate approach because many respondents were reached in the shortest time possible of 5 months by use of questionnaires, so that respondents describe their feelings, beliefs, knowledge, attitude and facial expressions can be noticed. A cross-sectional study makes it easy to compare different variables at the same time in pointing out the factors contributing to the increased rate of malnutrition in Nyumazi refugee settlement.

Study area

The research was conducted in Nyumazi refugee settlement camp in Adjumani District in the northern region of Uganda, which was allocated by the Office of the Prime Minister of Uganda. It is located in Dzaipi sub-county in Adjumani District, 5 kilometres off the Adjumani-Gulu highway in Dzaipi subcounty.

Study population

The study population consisted of all community members of Nyumazi refugee settlement camp, which consists of people from the Republic of South Sudan from different states; they include Kuku, Madi, Dinka, Kakwa, etc. All local nationals residing in the camp were also considered because they assisted in the provision of information.

Sample size determination

The sample size was calculated using Burton's formula (1905)

$$S=2(QR)O$$

S=required sample size

Q=number of days that were used while collecting data (n=10)

R = maximum number of respondents per day (n=3)

O = maximum time spent on each respondent (n=1 hr)

$$S=2 \times 10 \times 3 \times 1 = 60 \text{ respondents}$$

Therefore, a sample of 60 respondents was used to conduct the research

Sample technique

Simple random sampling was used to select the 60 respondents from community members of Nyumanzi refugee settlement camp, Adjumani District. Members were assigned to pick a number from a box without replacing it, so that each member had an equal chance to participate in the study based on the paper they picked.

Sampling procedure

I gave questionnaires to all caretakers of children under 5 years; this provided equal opportunity for every mother to participate in the study.

The above was achieved by asking the caretakers to pick a piece of paper containing yes or no; any caretaker who picked yes had the opportunity and was asked to participate in the study. And this event continued until the required number of respondents was achieved (60 respondents).

Data collection method

Data were collected using Questionnaires consisting of both open and closed questions. Questions included individual factors, community factors, and health-related factors. Anthropometric measurements such as weight and height were taken for each child using the standard techniques by WHO. For children less than 24 months, recumbent length was used instead of standing height.

Weight measurements were taken for all children below 59 months using the Salter hanging scale.

Data collection procedure

The caregivers of children below five were given questionnaires to answer, and that's how data were obtained.

Study variables

Independent variables

Socio-economic, environmental, and health-related factors contributing to increased cases of malnutrition among children below 5 years in Nyumanzi refugee settlement camp in Adjumani district

Dependent variables

Malnutrition among children below 5 years.

Quality control

To ensure quality control, the researcher, prior to the exercise, conducted a one-day training for three research assistants who thereafter set for field testing of the study tools. A total of six questionnaires were distributed for the pre-test. The research assistants were supervised closely by the principal invigilator himself.

Selection criteria

Inclusion criteria

All members of the adult age group and families residing in Nyumanzi refugee settlement camp in Adjumani district

Exclusion criteria

Mothers of children under the age of five years who refused to consent

Data management and storage.

Data management included checking for completeness and data editing before leaving the area of study to ensure that there are no mistakes or areas left unexploited.

Data analysis and presentation

Calculators and manual coding were used for data analysis, and the data was presented in the form of tables, bar graphs, and pie charts.

Ethical considerations

The supervisor provided approval, and then an introduction letter from the Principal, Kampala School of Health Sciences, was taken to the District Health Officer, and a copy was given to the administration of Adjumani General Hospital to obtain permission for the study.

Then, a consent form was given to caretakers of children between 18 and 45 and staff, which assured them of confidentiality and privacy by not using their names and not sharing the information on the questionnaire to maintain the respondent-researcher relationship during the process of the study.

Challenges and possible solutions

Language barrier among the illiterates: this was solved by getting translators; inadequate funds to implement data collection were solved by reducing the amount of money given to the translators; fear among the respondents to respond was solved by explaining the research objectives to the respondents and ensuring confidentiality of the information they provided.

Results

Demographic data

From Table 1, the respondents (75%) had children in the age group (1-3 years), whereas the least number of respondents (25%) had children in the age group 4-5 years.

In regard to sex, the study found out that the majority of the respondents (66.7%) had female children, whereas the least number of respondents (33.3%) had male children.

The study results showed that the majority of the respondents (67%) were parents of the children, whereas the minority of the respondents (2%) were uncles.

The study further revealed that most of the respondents (71.1%) were Protestants, whereas the least number of respondents (8.3%) were Catholics and born again.

From the study, half of the respondents (50%) were Dinka by tribe, whereas the least number of respondents (8.3%) were Madi by tribe.

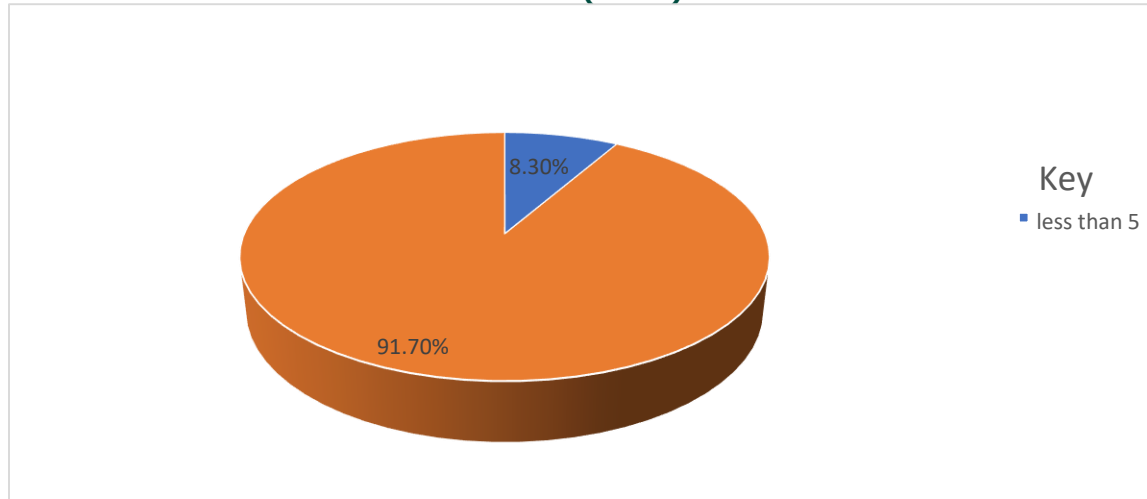
The study results showed that the majority of the respondents (66.7%) had children who weighed < 18.5kgs whereas the minority (33.3%) of the children of the respondents weighed > 18.5 kg.

Table 1: Showing the distribution of respondents according to their demographic data (N=60)

Response	Frequency (f)	Percentage (%)
Children's Age(years)		
1-3	45	75%
4-5	15	25%
Total	60	100
Children's Sex		
Female Male	40 20	66.7 33.3
Total	60	100
Relationship to children		
Parent	40 01 06 02	67 2
Uncle	11	10 3
Sibling		18
Aunt		
Others		
Total	60	100
Religion		
Muslim	7 5	11.7 8.3
Catholic	43	71.7
Protestant	5	8.3
Born again		
Total	60	100
Education level		
Primary Secondary	30 20	50 33.3
Tertiary University	5 5	8.3 8.3
Total	60	100
Tribe		
Madi	5	8.3
Kuku	10 30	16.7
Dinka	15	50 25
Others		
Total	60	100
Weight for age		
Weight> 18.5 kg	40	66.7
Weight < 18.5 kg	20	33.3
Total	60	100

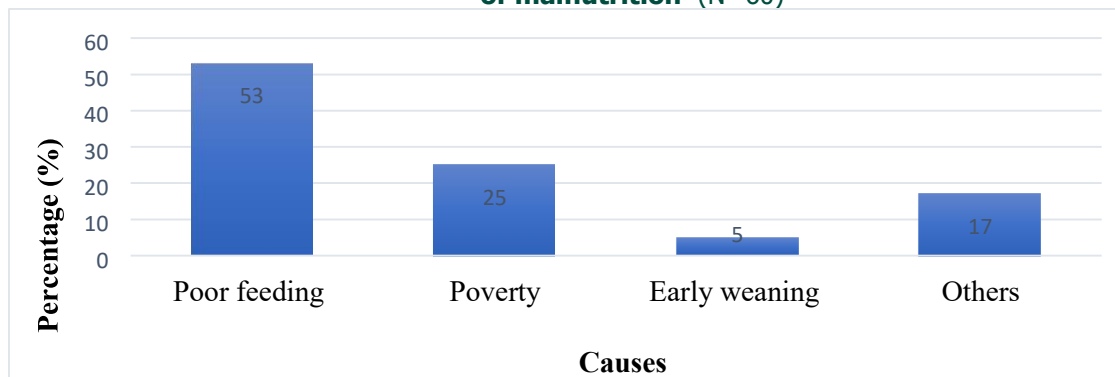
Socio-economic factors contributing to increased cases of malnutrition among children below five years

Figure 1: Shows distribution of respondents according to the family size (N=60)



From Figure 1, the majority of the respondents (91.7%) had more than five family members, whereas the minority of the respondents (8.3%) had fewer than five family members.

Figure 2: Showing the distribution of respondents according to their views about the causes of malnutrition (N=60)



From Figure 2, more than half of the respondents (53%) thought that malnutrition was due to poor feeding, whereas the least number of the respondents (5%) thought malnutrition was due to early weaning.

Table 2 shows the distribution of respondents according to their employment status. (N=60)

Employment status	Frequency(f)	Percentage (%)
Employed	10	16.7
Unemployed	50	83.3
Total	60	100

Table 2: The majority of respondents (83.3%) were unemployed, whereas the minority (16.7%) were employed.

Table 3 shows the distribution of respondents according to the number of meals their children receive per day. (N=60)

Response	Frequency(f)	Percentage (%)
One	35	58.3
Two	20	33
Three	2	3.3
Four	2	3.3
More than four times	1	2
Total	60	100

Table 3: More than half of the respondents (58.3%) reported that their children receive one meal per day, whereas the least (3.3%) reported that their children receive meals more than four times per day.

Table 4: Showing the distribution of respondents according to their views on preventive measures of malnutrition (N=60)

Response	Frequency(f)	Percentage (%)
Provision of a good diet	24	40
Improving hygiene	09	15
Giving children enough food	14	23
Others	13	22
Total	60	100

From Table 4, most of the respondents (40%) reported providing a good diet as the preventive measure of malnutrition, whereas the least number of respondents (15%) reported improving hygiene as the preventive measure of malnutrition.

Environmental factors contributing to increased cases of malnutrition among children below five years

Table 5 shows that most of the respondents (53.3%) obtained water from the borehole, whereas the least number of respondents (2%) obtained water from the well.

Table 5 shows the distribution of respondents according to the sources of water. (N=60)

Source of water	Frequency(f)	Percentage (%)
Tap	25	42
Well	01	2
Bore hole	32	53.3
Others	02	3.3
Total	60	100

Table 6: Showing the distribution of respondents according to whether they owned enough land for agricultural activities (N=60)

Response	Frequency(f)	Percentage (%)
Yes	2	3.3
No	58	96.7
Total	60	100

Table 6: Almost all respondents (96.7%) had never had enough land for agricultural activities, whereas the least number of respondents (3.3%) had land for enough land for agricultural activities.

Figure 3: Shows the distribution of respondents according to the types of toilets they use at home (N=50)

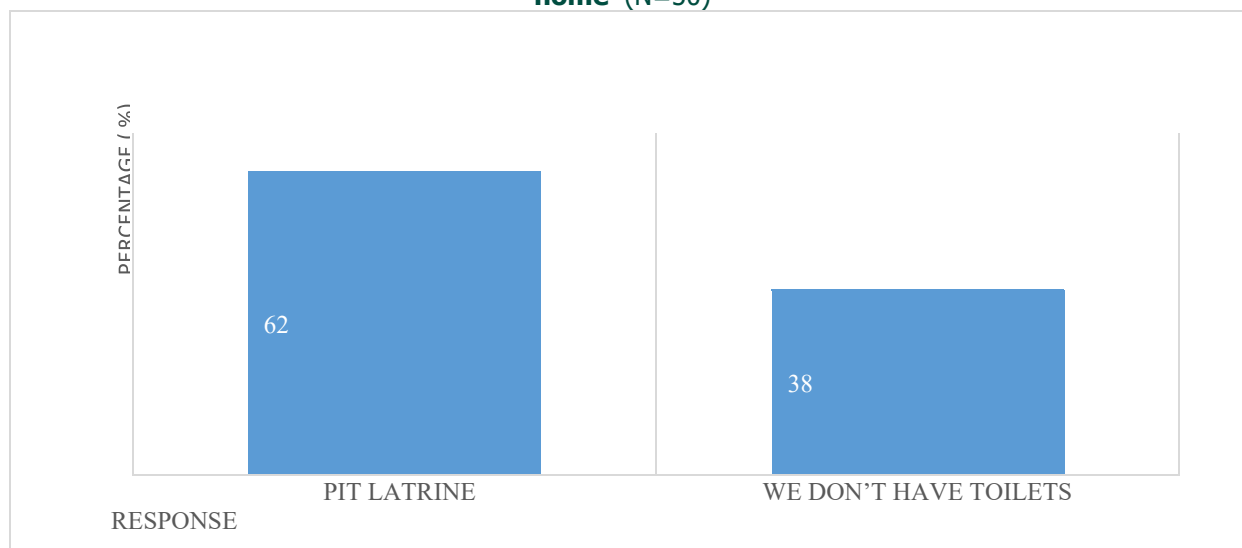


Figure 3: More than half of the respondents (62%) were using pit latrines, whereas the least (38%) never had toilets.

Table 7 shows the distribution of respondents according to how they keep their solid waste at home (N=60)

Response	Frequency(f)	Percentage (%)
In open heap garbage place	45	75
Small covered containers	04	7
Large open containers	02	3
In a polythene bag	09	15
Total	60	100

Table 7: The majority of the respondents (75%) kept solid waste at home in open heap garbage places, whereas the minority (3%) kept their solid waste at home in large open containers.

Health-related factors contributing to increased cases of malnutrition among children below five years

Table 8: Showing the distribution of respondents according to whether their children were exclusively breastfed (N=60)

Response	Frequency(f)	Percentage (%)
Yes	07	11
No	52	87
I don't recall	01	2
Total	60	100

Table 8: The majority of the respondents (87%) said their children were not exclusively breastfed, whereas the minority (5%) didn't recall whether the children were exclusively breastfed.

Figure 4: Showing the distribution of respondents according to the frequency of visiting the health facility

Figure 4 shows that most of the respondents (53.3%) had visited the health facility when they were very ill, whereas the least number of respondents (13.3%) had visited the health facility regularly when their children got ill.

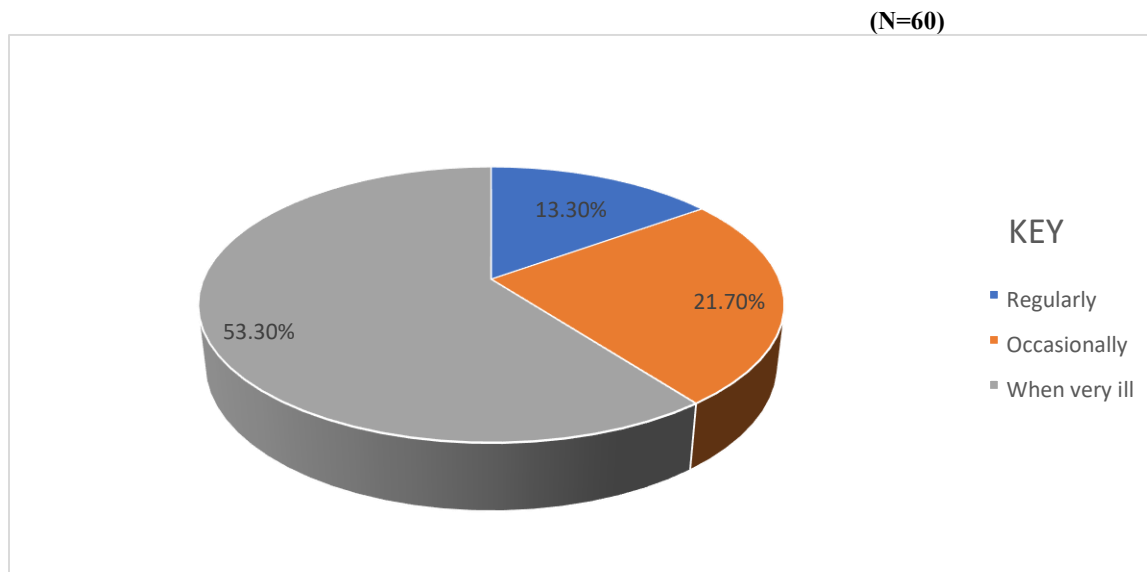
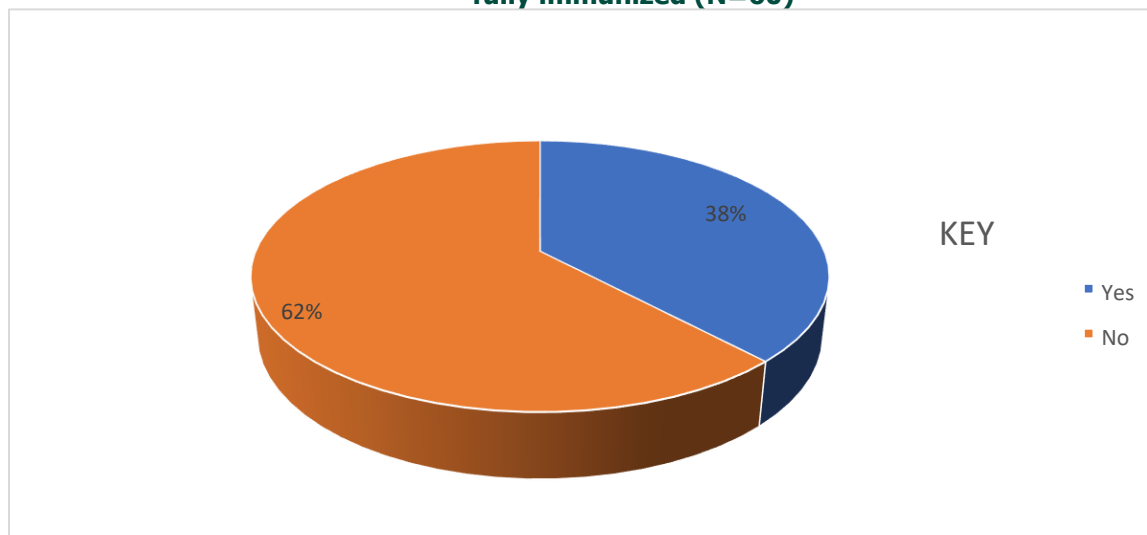


Figure 5: Showing the distribution of respondents according to whether their children were fully immunized (N=60)



From Figure 5, the majority of the respondents (62%) had children who were partially immunized, whereas the minority of the respondents (38%) had children who were fully immunized.

Figure 6: Showing the distribution of respondents according to whether they had health education on malnutrition

(N=60)

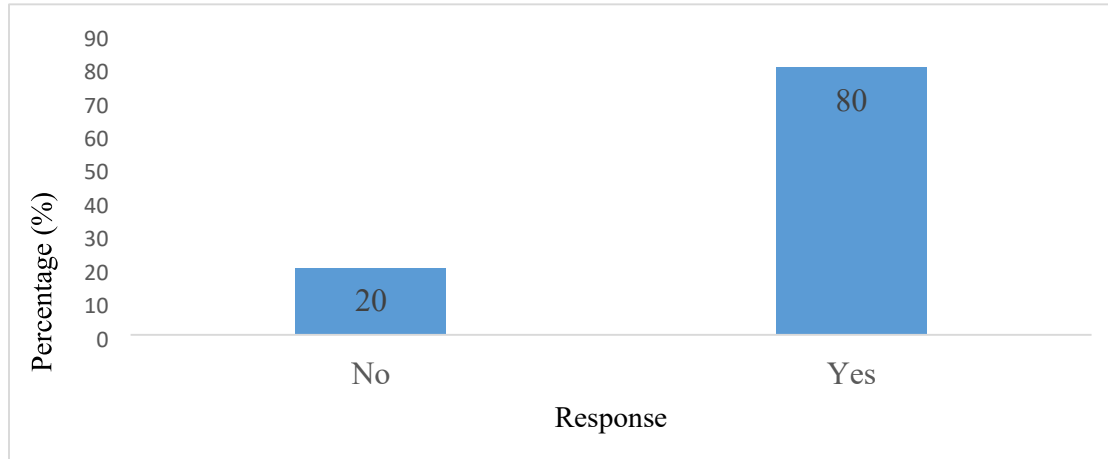


Figure 6: Almost all respondents (80%) had ever had any health education on malnutrition, whereas the fewest respondents (20%) had never had health education about malnutrition.

Table 9 shows the distribution of respondents according to the illnesses their children had in the past weeks (N=60)

Responses	Frequency(f)	Percentage (%)
Diarrhea	30	50
Malaria	05	8
Typhoid	13	22
None	02	3.3
Others	10	17
Total	60	100

Table 9 shows that most of the respondents (50%) reported that their children had suffered from diarrhea in the past weeks, whereas the least number of respondents (3.3%) reported that their children had never suffered from any illness in the past weeks.

DICUSSIONS

Socio-economic factors contributing to increased cases of malnutrition among children below five years

Most of the respondents (91.7%) had more than five family members. Therefore, this implies that the family size was larger, and they were most likely unable to afford the best necessities, hence predisposing them to malnutrition. The study findings were in line with Gebre et al (2019), where 70% of children were living in households with greater than

or equal to five family members. The study discovered that the majority of respondents (83.3%) were unemployed. This strongly confirms that the family heads had difficulty providing enough food for their families. The study further confirmed that more than half of the respondents (58.3%) reported that their children receive one meal per day. This was attributed to the fact that the family size was too big, yet their family heads were unemployed. The study results were consistent with Namusoke & Atuhaire (2018), where participants noted that their children had a medium dietary diversity score (42%).

Environmental factors contributing to increased cases of malnutrition among children below five years

Findings revealed that most of the respondents (53.3%) obtained water from the borehole. This implies that access to water in time also had an impact on the preparation of food in time and hence made children receive food late. This is inconsistent with Zemenu et al (2017), where results showed that the main source of drinking water used by households was 177 (46.1%) private pipe water.

The study discovered that 96.7% had never had enough land for agricultural activities. This is attributed to the fact that they were not permanent residents and, on top of that, not employed, hence predisposing their children to high risks of being malnourished. The study results were in disagreement with Abinya (2018), where 74% of the caregivers had land. More than half of the respondents (62%) were using pit latrines, but the researcher observed that the general cleanliness was totally poor, hence increasing the risks of other illnesses like diarrheal diseases. majority of the respondents (75%) kept solid waste at home in open heap garbage places. Therefore, open dumping contributes to the easy spread of diseases that result from poor management of solid waste and hence lowers the immunity of their children. The study results were in line with Namusoke & Atuhaire (2018), where (33.6%) households disposed of garbage in a pit and open field, respectively.

Health-related factors contributing to increased cases of malnutrition among children below five years

majority of the respondents (87%) said their children were not exclusively breastfed. Therefore, due to poor exclusive breastfeeding practices, these children's immune system had to be low, hence predisposing them to a high chance of getting several diseases. However, most of the respondents (53.3%) had visited the health facility when they were very ill. This strongly confirms that caretakers had poor health-seeking behaviors. The study further revealed that the majority of the respondents (62%) had children who were partially immunized. With such low uptake of

immunization, children were most likely to have low immunity to fight against diseases. This was in line with Katarybwe 2017), where significantly higher in children who were partially immunised compared to fully immunised ones. Most of the respondents (50%) said their children had suffered from diarrhea in the past weeks. This was as a result of the fact that children were living in an unhygienic environment with poor feeding practices and partial Immunization. The study results were in contrast with (Kalu R.E, Etim E.K.D 2018), where 65.7% of wasted children had certain health conditions such as diarrhoea.

Conclusion

Socio-economic factors contributing to increased cases of malnutrition were Large family size (91.7%), increased poverty levels (83.3%), inadequate meals (58.3%), and inadequate access to safe water (53.3%).

The environmental factors contributing to increased cases of malnutrition among children below five years were inadequate access to safe water (53.3%), inadequate access to land for agriculture (96.7%), and poor hygiene practices (75%).

Health-related factors contributing to increased cases of malnutrition were poor exclusive breastfeeding practices (87%), poor health-seeking behaviour (53.3%), partial immunization practices (62%), and persistent illnesses (50%) in children. Size of family members, poverty, inadequate access to land for agriculture, poor conditions of toilets, poor solid waste disposal, poor exclusive breastfeeding practices, poor health-seeking behaviour, partial immunization practices, and persistent illnesses were the major factors contributing to increased cases of malnutrition among children below five years.

Recommendations

Community health workers should intensively conduct health education programs and monitoring to address poor hygiene, safe storage of drinking water, and routine nutritional assessment for children below five years.

The NGOs should add food rations for the refugees to solve the issue of food shortages in the refugee settlement.

The members of Nyumanzi refugee settlement should visit the health facility frequently, not only when the children are very ill, so that the illness does not cause complications leading to malnutrition.

Acknowledgement

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List of abbreviations and acronyms

IREC	:	Institutional Research and Ethics Committee
LMICs	:	Low- and Middle- Income Countries
MAM	:	Moderate Acute Malnutrition
MDGs	:	Millennium Development Goals
MOH	:	Ministry of Health
MUAC	:	Mid Upper Arm Circumference
NGO's	:	Non-Governmental Organizations
PEM	:	Protein Energy Malnutrition
RR	:	Relative Risk
SAM	:	Severe Acute Malnutrition
SDGs	:	Sustainable Development Goals
UBOS	:	Uganda Bureau of Statistics
UNICEF	:	United Nations International Children's Emergency Fund

Source of funding

The study was not funded.

Conflict of interest

The author did not declare any conflict of interest.

Author contribution

Caroline Mazira collected data and drafted the manuscript of the study

Nabukenya Sharifah supervised the study

Prosper Mubangizi was the overall supervisor.

Data availability

Data are available upon request.

Ethical approval

The supervisor provided approval, and then an introduction letter from the Principal, Kampala School of Health Sciences, was taken to the District Health Officer, and a copy was given to the administration of Adjumani General Hospital to obtain permission for the study.

Informed consent

Then, a consent form was given to caretakers of children between 18 and 45 and staff, which assured them of confidentiality and privacy by not using their names and not

sharing the information on the questionnaire to maintain the respondent-researcher relationship during the process of the study.

Author biography

Caroline Mazira is a student of a diploma in clinical medicine and community health at Kampala School of Health Sciences.

Nabukenya Sharifah is a tutor at Kampala School of Health Sciences.

Prosper Mubangizi is the principal of Kampala School of Health Sciences.

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