

Factors Contributing to Malnutrition among Under-Fives: A Survey of Mubende Regional Referral Hospital, Uganda

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Abstract

Background: Over 90% of children with stunted growth are situated in Africa and Asia. Nearly 45% of deaths among under-fives in low and middle income countries are associated with under nutrition. In Uganda, malnutrition is accountable for 60% of the deaths among under-fives and it is the leading cause of premature death among the same age group in Mubende Regional Referral Hospital (MRRH). The study set out to determine factors contributing to malnutrition among children under-fives in Mubende Regional Referral Hospital.

Methods: The study was a cross-sectional survey involving mixed methods of data collection from 50 respondents and 10 key informants. Data collected was analyzed using Excel and results were presented using Tables, graphs and charts.

Results: The majority of participants were married (64%), housewives (42%), had primary education (42%), owned land (64%) but only 50% stated that their land was productive and 72% believed that poverty affected the children's nutritional status. Although 86% breastfed their children, most of them weaned them as early as 12 months (55.8%) owing to successive early pregnancy (58%). Supplementary feeds mainly porridge (60%) and cow's milk (20%) was served at most twice a day (48%). Also, 68% held cultural beliefs that impeded appropriate feeding of children for example; the respondents believed that feeding the under-fives on eggs delayed their speech ability.

Conclusion: Poverty is considered the leading factor contributing to malnutrition among under-fives. Other factors are: early pregnancy, family size, mother and fathers' levels of education, chronic diseases, perceptions, and early introduction of supplementary feeds. Land ownership does not assure nutrition unless it is productive. Nutrition literacy, food security, and meeting the family planning unmet need could control malnutrition in MRRH.

Keywords: Children; Mubende; Nutrition; Malnutrition; Under Nutrition; Under-Fives

List of abbreviations: HFA: Health for All; HMIS: Health Management and Information System; MRRH: Mubende Regional Referral Hospital; PACE: Program for Accessible Health Communication and Education; PEM: Protein Energy Malnutrition; PHC: Primary Health Care; RHCFCU: Rural Health Care Foundation Uganda; UNBS: Uganda National Bureau of Statistics; UNICEF: United Nations Children Fund; VHTs: Village Health Teams; WHO: World Health Organization

Introduction

Appropriate nutrition is an assurance to a healthy and productive society [1]. It prevents nutrition-related conditions, improves physical, mental and overall wellbeing [2]. Several organisations, projects and programs recommend an increase in the consumption of vegetables, legumes, fruits, grains, low-fat products, egg, fish and lean meat in addition to decreased intake of feeds associated with chronic illness such as cholesterol rich foods [2]. Due to increased awareness and community health promotion in the developed countries, malnutrition especially among under-fives is as low as 1% [3]. However, until now, malnutrition is a critical problem facing mostly Africa and Asia [1,4,5]. Malnutrition is generally classified as wasting, underweight, stunting, overweight, or thinness [5,6]. The classification is hinged on deviations from height and weight in reference to the World Health Organization's child growth standards [6]. Fundamentally, malnutrition is a sensitive indicator of abrupt change in health status and food availability [4]. It also portrays the socio-economic development of a country or society [7]. In that regard, nearly 45% of deaths among children under five years in low and middle income countries are associated with under nutrition [8] while 90% of children in Asia and Africa are stunted [4]. Moreover, overweight and obese children are at an increase in some regions with about 41 million under-fives being overweight across the globe [9].

In Uganda, mortality rate among under-fives is 90 per 1000 live births [10] of which 60% are attributed to malnutrition [11]. The prevalence of malnutrition currently among under-fives is 4% though in refugees dominated and post conflict areas; it is as high as 26.1% [11]. Generally, the common causes of death among under-fives are: malaria, diarrhoea, and severe or moderate anemia [10]. But in post conflict regions it is majorly Protein Energy Malnutrition (PEM) [12]. The increased number and severity of the infections commonly intensify the risk of death [10].

In Mubende Regional Referral Hospital (MRRH), the proportion of undernourished children as of 2015 was 35% [13]. The situation is not any different in the neighboring districts for example in Kabalore district, 40% of the children under five were stunted in 2009 [7]. It is the leading cause of death either directly or indirectly among children below five years of age in Mubende district and is likely to continue to hasten death, disability, stunted mental and physical growth if not addressed sooner [14]. The effects do not only affect the child but also the mother. Mothers whose children are malnourished are 2.23 folds more likely to suffer from depression than those whose children are well-nourished [15].

The importance of nutrition in health and socio economic development was fully recognized at the Alma-Ata Convention in Russia and Primary Health Care (PHC) declaration and was made an objective of Health for All (HFA). Promotion of food supply and proper nutrition was listed as one of the major elements of PHC in 1978 [16]. However since then to 2010, Uganda still had 38% of her children suffering from stunting [17]. In 2015, the percentage of babies who were exclusively breast-fed was 63% and initiation in the first hour of birth was 53% [13]. The 2012 report by Save the Children revealed that elimination of barriers to breastfeeding could save children's lives. It estimates that 22% and 16% of the newborn deaths could be prevented with initiation of breastfeeding in the first hour after birth and the first 24 hours respectively [18]. Apart from breastfeeding patterns, other factors associated with malnutrition among under-fives in Uganda are uneven distribution of food which is attributed to seasonal factors, poverty [9,19,20], diseases and domestic violence [20].

The root causes of malnutrition include poverty and inequity [10,21,22]. According to Owor M *et al.*, (2000) poverty is a cause of hunger, lack of adequate food and poor nutrition, lack of awareness of proper nutritional requirements and types of food to give to the children [20]. Land ownership and agricultural practices cannot be ignored [20]. According to a study conducted among malnourished children in Mulago hospital, children of parents without land of their own were 4.62 (CI 2.09 - 10.3) times more likely to suffer from PEM than those who whose parents owned land [20]. The same trend was observed among those without livestock being 13.65 (CI 3.60 - 60.84) times more likely to suffer from PEM than those who owned livestock [20]. A study conducted in Kenya also indicates that children whose grandparents owned fragmented pieces of land were six folds more likely to suffer from PEM [23].

Well knowing that 19.7% of Ugandans are poor and are less likely to have land of their own and or livestock [24], it is very evident that malnutrition affects and will continue to affect our society on a large scale with very destructive outcomes. Therefore this study aimed to describe the causes of malnutrition among under-fives in MRRH, Mubende district. This was achieved through specifically determining the socio-cultural, economic, and ecological factors contributing to malnutrition among under-fives in MRRH as well as identifying their feeding patterns. Such information has policy implications and would be a basis for appropriate interventions. The variables of interest were conceptualized as in Figure 1.

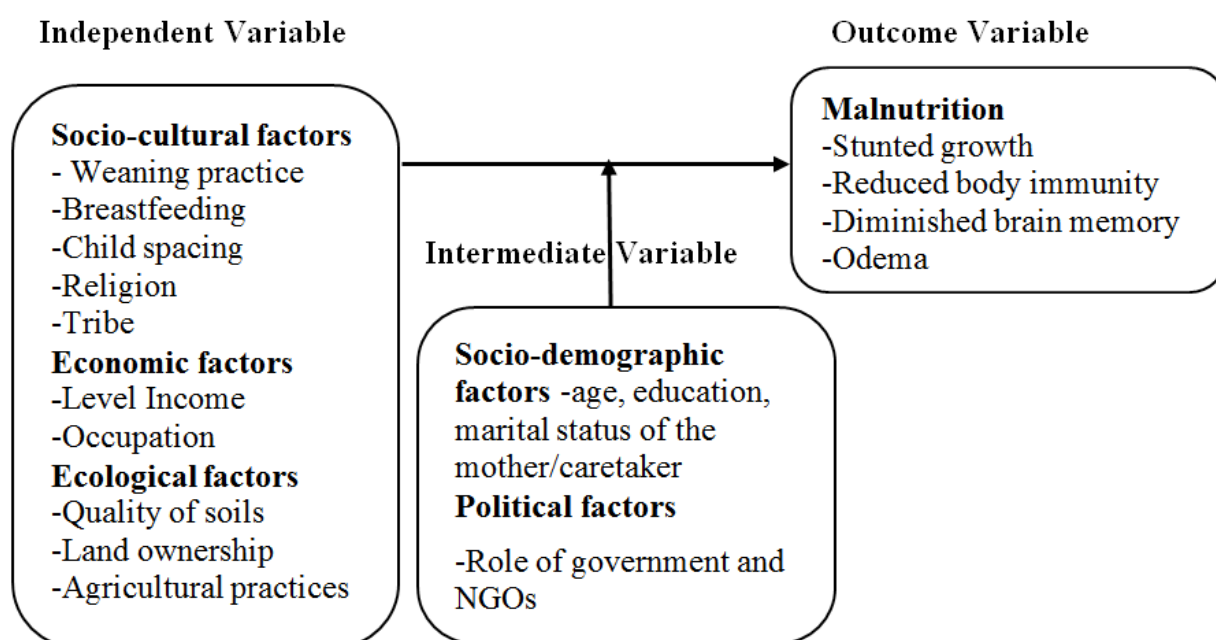


Figure 1: Conceptual Framework

Materials and Methods

It was a cross-sectional, descriptive study employing both qualitative and quantitative methods of data collection. It was conducted in MRRH, Mubende district in central part of Uganda located 139Km from Kampala city in Mubende town council. The study population consisted of all children under-five years of age as per their vital statistics in MRRH and the respondents were mothers or care takers and health workers at MRRH. The children were inpatients presenting with severe malnutrition majorly underweight, stunting and wasting. Children under five years were considered for this study in reference to the report by the Rural Health Care Foundation Uganda (RHCFU) in 2017 which indicated that malnutrition was the leading cause of death among children below five years of age in Mubende district. The study explored the socio-cultural, economic and ecological factors which predispose children under-fives to malnutrition.

The sample size was determined by using Kish L (1965) formula as shown below [25];

$$n = \frac{z^2 p Q}{d^2}$$

$$\text{But } Q = 1-p, \text{ therefore } n = \frac{z^2 p (1-p)}{d^2}$$

Where; n= sample size

Z= Standard normal deviation corresponding to 95% confidence interval was =1.96

Per P=Proportion of undernourished children= (35%) = 0.35

d= Precision of the study ($\pm 10\%$) =0.1

Therefore:

$$n = \frac{z^2 p (1-p)}{d^2}$$

$$n = \frac{1.96 \times 1.96 \times 0.35 \times 0.35}{0.1 \times 0.1}$$

n= 47.06 Hence n= 48 respondents.

In order to cater for bias of some respondents and have an easily manageable number, 50 respondents were involved in the study.

The respondents were selected by random sampling technique and purposive sampling. The names of mothers/care takers were written on pieces of paper after which folded and placed in a box. The small pieces of paper were thoroughly mixed and the required numbers of respondents obtained by picking one paper from the box and recording that respondent without replacing the paper back into the box and then continued mixing thoroughly before picking another paper until the required number of respondents was attained. The selection of health workers was purposively done since the health workers are of different cadres with relevant and appropriate information to achieving the study purpose.

The principle researcher and research assistants collected data using questionnaire, personal observation check list and key informants interview guides. Pre-designed, pretested and semi structured questionnaires were used to collect quantitative data on malnutrition in children under-fives. Personal observation was an indispensable and important tool to gather quantitative information on signs and symptoms of malnutrition in under-fives. Face to face interviews were conducted with key informants where qualitative data was obtained. Key informants included; Health Workers, Village Health Teams (VHTs), Hospital Administrator, Health Educator, Nutritionist and local leaders. In total 10 face to face interviews were conducted.

Quantitative data was analyzed using Excel while qualitative data was analyzed thematically. Validity and reliability were ensured through training of research assistants for one day on how to administer the questionnaires. They were fluent in English and local languages both written and spoken and they included the Nursing Assistant, Assistant Health Educator and two VHTs. The questionnaires were pretested at Mubende Town Council Health Center II in a pilot study to ensure that they collect the intended data and also ensure reliability and validity. Field meetings were held between the principal researcher and research assistants in the study area, data collected was edited, coded and grouped for reliability and validity.

As part of ethical consideration, ethical approval was obtained from Cavendish University: IRB 02/2618/135803/W. Also, written permission and introductory letter to conduct the study were sought and obtained from the university and presented to Mubende District Health Officer and MRRH administration. The rights and interests, values, cultures and confidentiality of respondents as well as those of the public were observed. Respondents were informed of the purpose of research and sought respondents consent before proceeding with the interviews while those who opted out were not involved in the study.

Feedback was given to the community through formal meetings organized by MRRH leaders, and their input was incorporated as recommendations. A dissemination workshop was organized at the district headquarters attended by various responsible officers for example District Health Officer, District health inspector, Hospital director and administrator for necessary action as per recommendations. Results of the study were also disseminated to the faculty of Technology and Science- Cavendish University.

Result

Socio-Demographic Characteristics of Respondents

The majority of the respondents 54% were females while 46% were males. Most of the respondents, 64% were below 35 years of age while 18% were between 35 to 45 years and 18% were above 45 years of age. Most of the respondents' children, 52% were between 0 to 12 months of age, followed by 30% between 12 to 24 months and 18% were between 24 to 36 months of age. The socio-demographic characteristics are illustrated in Table 1.

Variables	Responses	Frequency n=50	Percentage (%)
Sex of respondents	Male	23	46.0
	Female	27	54.0
Age of respondent in complete years	18-25	13	26.0
	26-35	19	28.0
	36-45	09	18.0
	Above 45	09	18.0
Age of the child	0-6 months	05	10.0
	6-12 months	21	42.0
	12-18 months	08	16.0
	18-24 months	07	14.0
	24-36 months	06	12.0
	36-60 months	03	6.0

Table 1: Demographic Characteristics of Respondents

Socio-Cultural Factors Contributing to Malnutrition among Under-Fives

Most of the respondents, 64% were married, 22% were single while 6% were widowed. Most participants, 42% were housewives, 36% were farmers, 12% traders and 10% civil servants. Only 42% had attained primary education, followed by 38% with secondary education and 8% with tertiary education. As far as house ownership is concerned, 64% had houses of their own whereas 36% rented. The Catholics were 52%, followed by Protestants 22%, Evangelical Christians 14%, Muslims 6% and Adventist also 6%. Most respondents, 68% had a household population below 5 while households with 5 to 10 people were 32%.

Concerning cultural beliefs with regards to children feeding, 68% held cultural beliefs and mentioned that children below the age of five are not permitted to eat eggs because of the perception that egg consumption among children below 59 months delays speech. However, 32% did not hold any cultural beliefs. The socio-cultural characteristics are illustrated in Table 2.

Variables	Responses	Frequency	Percentage (%)
Marital status of respondents	Single	11	22.0
	Married	32	64.0
	Widowed	03	6.0
	Divorced/separated	04	8.0
	Engaged	00	0.0
Occupation of respondents	Farmer	18	36.0
	Housewife	21	42.0
	Civil servant	05	10.0
	Trader	06	12.0
Education level of respondents	Primary	21	42.0
	Secondary	19	38.0
	Tertiary	04	8.0
	Not attended	06	12.0
Residential status	Owned	32	64.0
	Rental	18	36.0

Variables	Responses	Frequency	Percentage (%)
Religion of the respondents	Catholic	26	52.0
	Muslim Adventist	03	6.0
	Born again	03	6.0
	Protestant	07	14.0
		11	22.0
Household population	Below 5 people	34	68.0
	5-10	16	32.0
	11 and above	00	0.0
Cultural beliefs related to child feeding	No eating eggs before 3 years of age	34	68.0
	No cultural beliefs	26	32%

Table 2: Socio-Cultural Factors Contributing To Malnutrition among Under-Fives

The key informants highlighted cultural beliefs as very influential in affecting child nutrition and health

Economic Factors Contributing to Malnutrition among Under-Fives

Most of the respondents 72% reported poverty as the leading cause of malnutrition among under-fives while 28% reported inadequate knowledge of feeding practices. When asked about how poverty leads to malnutrition, 72% reported inability to buy nutritious food, 16% mentioned lack of access to medical facilities and 12% said it leads to poor housing hence increased risk of infections. These findings are summarized in Table 3.

Variables	Responses	Frequency	Percentage
Reasons why under-fives get malnourished	Poverty	36	72.0
	Lack of knowledge on feeding	14	28.0
Relationship between poverty and child malnutrition	Poor housing	06	12.0
	Failure to buy nutritious food	36	72.0
	Lack of access to medical facilities	08	16.0

Table 3: Economic Factors Contributing to Malnutrition among Under-Fives

All key informants mentioned poverty measured by household income, land ownership and or ownership of other property as the cause of malnutrition among children below five years of age.

Key informant 1 mentioned “Mubende District has all classes of people. Some are very rich, you know them don’t you? Others are middle class, but the majority is grassing”. Some men have completely abandoned their responsibilities and for that reason women are overburdened with household responsibilities. Most women do not feed well. They strive to feed their children at least once a day. In fact malnutrition starts way back before conception, a malnourished mother definitely gives birth to a malnourished baby”.

Ecological Factors Contributing to Malnutrition among Under-Fives

Majority of the respondents; 64% owned land while 36% did not own land. Nearly half of the respondents; 44.4% reported lack of land ownership due to displacements, 33.3% reported that its owned communally while 22.2% reported that they are squatters as illustrated in Figure 2.

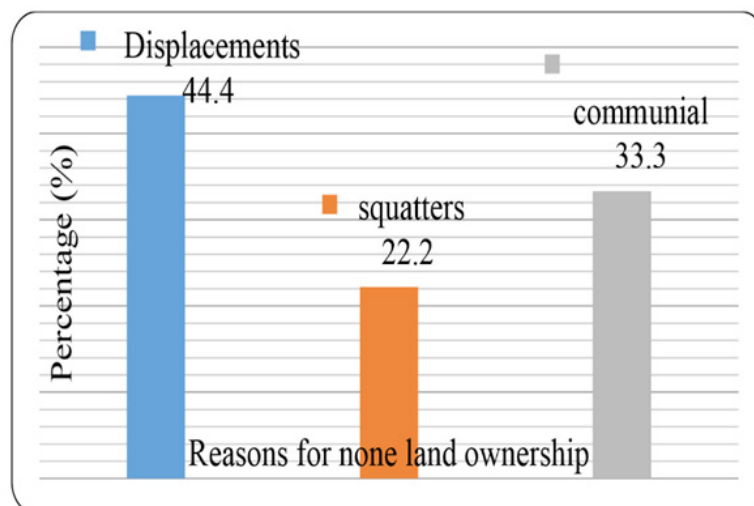


Figure 2: Reasons for None Land Ownership

Considering land productivity, 50% of the respondents reported that their land was productive, 28.1% reported somehow productive while 21.9% reported none productive.

Key informant 4 stated that “food production is not Uganda’s problem and Mubende district in Particular. Mubende district produces adequate amounts of organic foods such as banana, sweet potatoes, cassava, yam, pumpkin, poultry products, cattle products, pork, mutton, vegetables and all kinds of fruits. However, households sell-off the produce to meet other demands such as school fees, medical bills and others. They are left with very little to feed on. In fact, most households have only one meal a day despite large quantities of food they produce per season”.

Other key informants highlighted mainly land fragmentation and climatic change as major factors affecting nutrition in Mubende district.

“We used to have four seasons a year but now I even cannot tell how many they are. We have prolonged dry seasons and when it rains, it is accompanied by hailstorm which destroys everything on the ground” Key informant 7 stated.

Children Feeding Practices

Respondents when asked whether or not they breastfed their children, 86% had breastfed their children while 14% had not breastfed as illustrated in Figure 3. Of those who breastfed, 37.2% breastfed for 6-12 months followed by 25.6% who were still breastfeeding while 2.3% breastfed between 18-24 months of age. Majority of the respondents 80% supplemented breastfeeding while 20% did not. Among those who supplemented breastfeeding, 60% gave porridge, 20% cow’s milk and 20% banana as further illustrated in Figure 4. “Supplementary feeding in addition to breastfeeding improves children’s nutritional status” said Key informant 7.

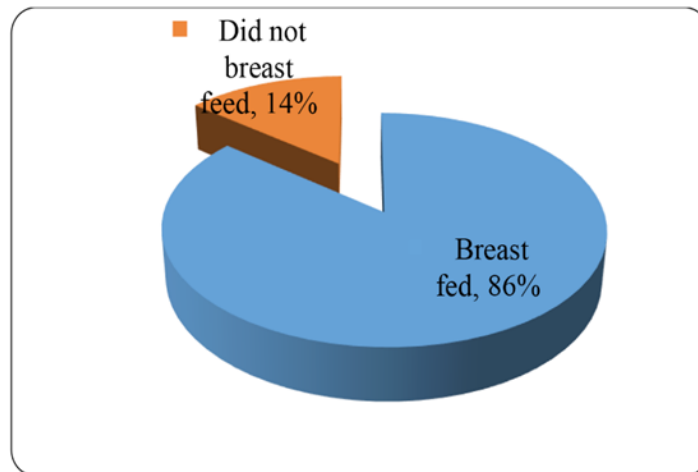


Figure 3: Whether the Child Breastfed or not

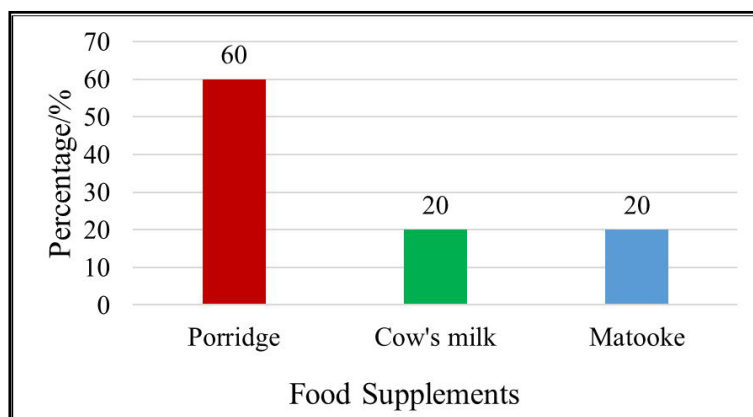


Figure 4: Food Supplements given to Under-Fives

As far as the duration of feeding is concerned, 48% feed their children twice a day, 32% thrice while 2% fed their child more than three times a day as illustrated in Figure 5. When asked why they introduced other foods at an early stage, 58% reported early subsequent pregnancies, 32% mentioned availability of adequate foods amidst insufficient breast milk while 10% reported cultural reasons.

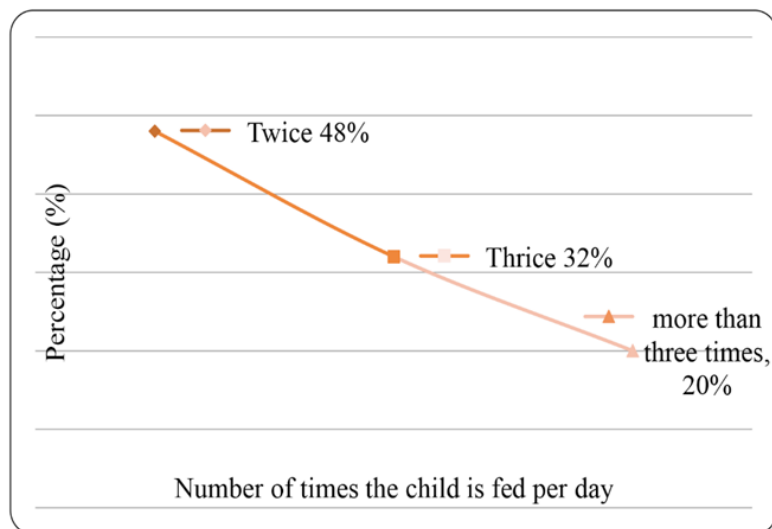


Figure 5: Number of Times the Child is Fed

Regarding how children are fed, 62% reported that children are fed by adults, 30% reported that children are given separate plates and 28% reported that children share plates with adults. The information is summarized in Table 4.

Variables	Responses	Frequency	Percentage (%)
Whether they breastfed or not	Yes	43	86
	No	07	14
Duration of breastfeeding	Still breastfeeding	11	25.6
	0 to 12 months	24	55.8
	12 to 24 months	5	11.6
Number of times a child is fed a day	Above 24 months	3	7.0
	Once	00	0.0
	Twice	24	48.0
	Three times	16	32.0
How children feed	>three times	10	20.0
	Separate plates	15	30.0
	Share plates	14	28.0
	Fed by adults	31	62.0
Introduction of food supplements	Yes	40	80.0
	No	10	20.0
Major food supplements	Porridge	24	60.0
	Cow's milk	08	20.0
	Matooke	08	20.0
Reasons for introducing other feeds early	Availability of other foods	16	32.0
	Cultural	10	10.0
	Early subsequent pregnancy	29	58.0

Table 4: Children Feeding Practices

Key informants had common view regarding children feeding practices. They believed that very few mothers exclusively breastfeed their babies even in the first six months. They mentioned resumption of duty soon after birth, nutrition illiteracy and post-partum depression as factors affecting exclusive breastfeeding. "Most mothers use mixed feeding method to feed their babies, they opt for bottle feeding which in some instances is unhygienic resulting in severe diarrhoea and its effects" stated key informant 2.

Discussion

Socio-Cultural Factors Contributing to Malnutrition among Under-Fives

The effect of sociocultural factors on malnutrition in central Uganda can be traced way back to pre-colonial period, however the trend has been changing from societal causes mainly conservatism and superstition to individual causes [26]. The study indicated that most of the children who were malnourished belonged to mothers below 35 years of age and with primary level of education and below. Such results are not unique; several studies indicate that maternal and household characteristics are significantly associated with nutritional status of both children and adults. Young mothers especially those below 18 years with low level of education, residing in rural areas are more likely to have stunted children [4,18,26-31]. However, mothers with similar characteristics who attend antenatal care at least 3 times are more likely to have healthy children [27]. Completion of immunization schedule is also significant [18].

Nutrition literacy affects nutritional behaviors, and consumer culture [30]. A study by Owor M *et al.*, 2000 did not find any association between the mother's level of education and severe malnutrition [20]. This could be perhaps due to setting and exposure of participants. Considering the very large numbers of studies indicating the mother's level of education as significant to the child's nutritional status, the study concludes that the mothers' educational level is indeed significant. The fathers' level of education is also considered influential though not as significant as the mother's [27,30,31]. Child spacing and general feeding practices of households and child care also affect child nutrition [11].

Cultural beliefs related to child feeding were revealed by (68%) of the mothers who reported that they do not give eggs to children below five years of age since eggs disrupts them to start speaking. Eggs are an important source of protein, micronutrients, and fats [2]. Basically eggs play a fundamental role beyond just nutrition. However, traditionally they are acknowledged cholesterol content hence having adverse effects to health [2]. Legason and Dricile (2018) similarly found out that socio-cultural aspect such as feeding practices determine children nutritional status [11]. Socio-cultural practices impact greatly on food security which exposes children to the risk of malnutrition. Among other cultural factors include: norms, myths, and taboos restricting consumption of certain foods especially from animal source. Cultural practices also promote pre-lacteal feeding, affecting the implementation of exclusive breastfeeding [29]. However, this study had been done in Karamoja region where cultural factors may differ from those within Mubende district.

Underlying illness is another factor affecting the nutritional status of infants [32]. For example HIV-exposed infants have higher odds of stunting, underweight and wasting compared to the unexposed. They are also more likely to present with anemia as they grow [33].

Economic factors contributing to malnutrition among under-fives

The majority of the respondents (72%) identified poverty as the leading factor contributing to malnutrition among under-fives. They mentioned inability to buy nutritious foods, access medical facilities and proper housing conditions as related factors. Nevertheless, 64% owned land although only 50% stated that their land was productive. Malnutrition and hunger-related diseases cause 60 percent of child deaths [34]. Uganda is among low income countries where malnutrition among under-fives is one of the top ten causes of morbidity and mortality [35]. Economic factors especially on the food supply side as well as household income are the leading causes of Protein Energy Malnutrition (PEM) [22,26]. Income affects meal planning and overall food consumption. It is directly affected by employment status majorly occupation, and unemployment. Also, in case of inflation or increased food prices, regular food consumption is affected and this in turn directly impacts one's nutrition with common indicators of underweight and wasting [30,31].

Ecological factors contributing to malnutrition among under-fives

The study indicates that 36% of the respondents did not own land to carry out agricultural activities. Although the majority owned land, its size and productivity must be considered. In fact only 50% stated that their land was productive. Land ownership is considered statistically significant to PEM among children under five years [20]. Accordingly, 60% of severely malnourished children came from households without land and or livestock [20,23]. Even so, Wamani TT *et al.*, (2004) indicates no differentials between land ownership and stunting [21]. Therefore, much as land ownership affects the child's nutrition and health, other factor such as seasonal conditions like drought, heavy rains, and floods may affect the harvests even when one has large chunk of land leading to hunger which results in malnutrition [9].

Children feeding practices

The study established that (58%) of the mothers breastfed their children for less than 12 months mainly due to early pregnancies (55.8%). A study by Legason and Dricile (2018) observed that nutritional status of children is influenced by breastfeeding habits, and weaning practices [11]. The time of initiation of breastfeeding is critical. Breastfeeding should be initiated in the first hour following birth and thereafter it should be exclusive for the first six months [32]. Exclusive breastfeeding and complementary feeding are good feeding practices to improve child nutrition [17,18,36,37]. Nonetheless, breastfeeding is no longer exclusive in most communities, it is typically supplemented by various infant formula on market and worst still prepared using contaminated water [33]. Children who are on breastfeeding despite their nutritional status, recover much faster than those who are not breastfed [38]. However, many mothers find it inevitable to start early weaning. Early and abrupt weaning has mainly been due to accidental or early pregnancies and is significantly associated with malnutrition as well as child mortality [28].

Therefore, policies and programs should emphasize when to initiate breastfeeding, for how long, growth monitoring, general nutrition literacy, oral rehydration, immunization, male involvement, child spacing, appropriate food supplementation for age, and control and management of nutritional deficiencies [30]. Programs should be national wide, targeting every district, every mother and every child. The programs should warrant each mother's nutritional status during pregnancy and ensure that each child receives immunization, and desired micro and macro nutrients during infancy and thereafter. Cooking demonstrations should be done by health workers as has been the case in Mozambique [39]. However, they should be culturally sensitive, and should stress behavior change [30,38,39].

Additionally, strategies aimed to encourage dietary diversity, child growth, and the prevention and regulation of micronutrient malnutrition should be boosted [39].

Conclusion

Poverty is the leading factor contributing to malnutrition among under-fives in MRRH. Other factors are: early pregnancy, family size, mother and fathers' levels of education, chronic diseases, perceptions of feeding children on certain foods, and early introduction of supplementary feeds. Owning land does not assure nutrition but rather its size and productivity. Nutrition literacy, food security, and meeting the family planning need would control malnutrition in MRRH. A wider study investigating the relationship between cultural perception and malnutrition among under-fives is desired.

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