Factors Influencing the Prevalence of Malnutrition among Children under five Years attending Mubende Regional Referral Hospital, Uganda

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ABSTRACT

Globally, approximately 151 million children under 5 suffer from stunting and in 2017, nearly 51 million children under 5 were wasted. In Uganda, child malnutrition is one of the most serious public health problems and among the highest in the world with about 28.9% stunted and 3.6 % wasted in 2015. Therefore, the purpose of this study was to identify prevalence of malnutrition and determine the associated factors that influence malnutrition among children under the age of 5 years among children attending MRRH. A hospital based cross-sectional descriptive study was conducted on 113 respondents. Data collection was done using a pretested questionnaire and the Emergency Nutrition Assessment software version 2015 was used to generate z-scores and the Weight for Height Z-scores (WHZ) were generated using WHO 2005 Growth Standards. The data was then exported to IBM SPSS version 25 for analysis. The age of children in this study ranged from 6 to 59 months with mean age of 22.3 ±14.2 (Std. deviation) months. Majority of the children were females (60.2%, n=68). Factors significantly associated with malnutrition in this study was: low birth weight (X^2=33.64, P=<0.001), positive history of infectious disease in the two weeks preceding the study (X^2=12.67,P=<0.001), and low socioeconomic status (X^2=25.45, P=<0.001). The prevalence was 31.9%, of which 25 (58%) were wasted and 18 (42%) were stunted. Malnutrition still remain a herculean challenge in Uganda and the rest of Africa. While there are some reduction of global prevalence of malnutrition from 1999 to 2015, however, there is a disparity as African countries like Uganda still have increased prevalence of this condition. The major factors influencing Malnutrition among children attending the MRRH are low birth weight of, history of infectious diseases, and low socioeconomic status of the parents/caretakers. And there was a significant prevalence of malnutrition of 31.9%. The Mubende district health Team should work in conjunction with the ministry of health to carry out more sensitization regarding nutrition of children with a special focus on supporting people of low socio-economic status (peasants), promoting education on child feeding and nutrition and prevention of common illnesses associated with children with malnutrition.
Keywords: Prevalence, malnutrition, children, under five years

INTRODUCTION

Malnutrition is one of the foremost global health burdens and it is common in low –and middle- income countries like Uganda. Malnutrition can be either under-nutrition or over-nutrition, howbeit; this paper will focus only on Under-nutrition [1-15]. Under-nutrition is defined as the result of deficiency of protein, energy, minerals as well as vitamins leading to loss of body fats and muscle tissues [6]. This deficiency of nutrition can be caused by either inadequate intake or poor absorption of nutrients in the body. Malnutrition mainly affects children, especially those under five years of age where sufficient nutrition is important to their normal growth and development [7]. Children under five years with acute malnutrition have rapid onset of bilateral pitting edema or sudden weight loss and they are highly vulnerable and have high mortality risk. Additionally, they are often prone to infections, thereby producing a synergistic affect [8-12]. To salvage the problem of malnutrition, sufficient evidence-based information is needed not only globally but also at a national and local level. Therefore, this paper aims at investigating factors influencing the prevalence of Malnutrition among children under five years of age in Mubende Regional Referral Hospital. The mortality rate among under-fives is 90 per 1000 live birth of which 60% are attributed to Malnutrition [1]. In

Uganda over one-third of children below 5 years of age are stunted. The Country is ranked 13th position by UNICEF based on the number of stunted children with approximation of 3 in 10 children under 5 being stunted. Statistics from Uganda Demographics and Health Survey reveals that 3.6% children suffer from moderate Acute Malnutrition, while 1.3% have severe acute malnutrition. The prevalence of acute malnutrition inUganda among children under five years of age is 4%.

In Mubende Regional Referral Hospital (MRRH), the proportion of Malnutrition is not well knowndue to paucity of data. Therefore, this study was aimed at assessing the prevalence of malnutritionamong children under five years attending Mubende Regional referral hospital and find out the factors that influence such prevalence.

METHODOLOGY
Study design
This research used a descriptive cross-sectional study design.
Study area
The research was conducted at Mubende Regional Referral Hospital (MRRH).
Study population
The study population included children aged 6-59 months admitted in Mubende Regional Referralhospital during the time of the data collection for the research.
Inclusion criteria
Only caretakers with children under 5 years, who gave informed consent were included in the study.
Exclusion criteria
Children severely sick
Children whose care takers fail to consent to the studyChildren
with congenital deformity
Sample size determination
The sample size will be calculated using Kish and Leslie formula [13] whichstates that.

$$n = \frac{z^2 p(1-p)}{d^2} \text{ for a population} \geq 10,000$$

Where:
n = the desired sample size
P = 8.0% estimated number of children with malnutrition in Central region [14].
Z² = (1.96) Standard normal value at 95% confidence level
d = Margin of error between the sample and the population = 5%

Therefore n

$$= \frac{1.96^2 x\ 0.08\ (1-0.08)}{0.05^2} = 113.$$

Therefore, the respondents were 113.

Sampling procedure
Simple random sampling was used in the recruitment of participants. All children who were admitted to pediatric ward starting from the date of commencement of data collection, and fulfilledthe selection criteria, were successively recruited for the study after obtaining the consent from thecaretaker. A lottery method using names from admission register was used to select consecutively10 study participants at random on daily basis. The recruitment continued until the intended samplesize (113) was achieved.
Data collection methods and management
Data was collected using a self-administered semi structured questionnaire. The data collection took at least 2 weeks. The in charge of the pediatric ward was met first and was given approval letters to allow data collection to take place. Data was captured in Microsoft excel 2019 version and then Anthropometry data extracted into Emergency Nutrition Assessment (ENA) software version 2015. Anthropometric measurements included weight and height. Body weight was measured to the nearest 0.1 Kg. It was measured with light clothing and no shoes. Calibration of the weighing scale was done before weighing eachparticipant by setting it to zero. The weighing scale would be checked against a standard weight for its accuracy on daily basis. Height of the participants was measured using 'Seca' vertical heightmeasuring scale with the subject standing upright in the middle of the board. For infants who are unable to stand, a height board was used. The occiput, shoulder, buttocks, and heels touched the measuring board [15] and height was recorded to the nearest 0.5 cm.
Data analysis
The researcher used Emergency Nutrition Assessment (ENA) software version 2015 to generate z-scores and the Weight for Height Z-scores (WHZ) using WHO 2005 Growth Standards. The WHO cut off points for

mild/moderate malnutrition- weight-for- height z-scores less than -2 SD, severe acute malnutrition (SAM)-weight-for-height z-scores less than -3 SD and/or with bilateraledema were used. Z-scores acquired from ENA were incorporated into the Microsoft excel 2019 data. The data were then exported to IBM SPSS version 25. The variables were categorized and analyze using the Chi-square test for the relationship between the dependent and independent variables where a p-value ≤0.05 at 95% CI, were considered as significant.

Ethical consideration

Ethical approval of this study was sought from Kampala international university western campus,Faculty of clinical medicine. An introduction letter was given after approval of the proposal. Thisstudy included a written statement of informed consent which was given to the participants (mothers/caretakers) of the study. Permission to collect data was sought from Mubende RegionalReferral hospital administration.
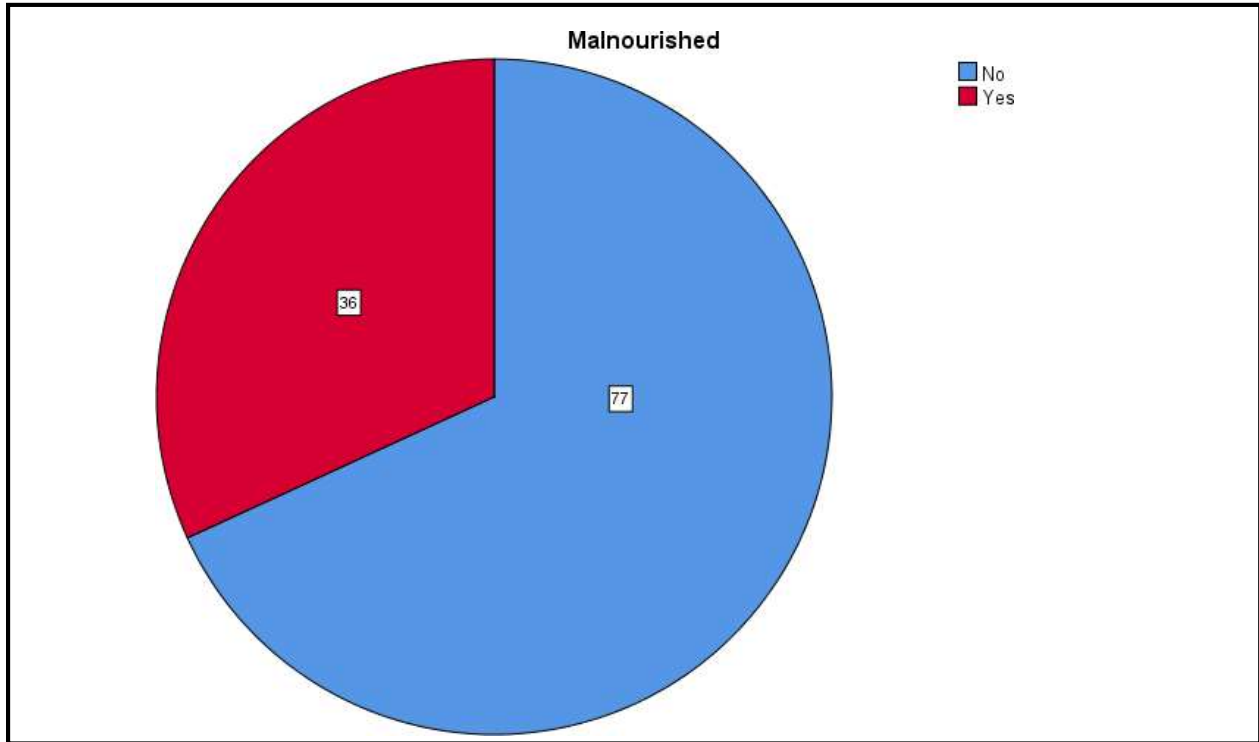
RESULTS

Table 1: Characteristics of study participants

| Characteristics	Frequency	Percent
Child's age (months)		
6-11	49	43.4
12-23	27	23.9
24-35	15	13.3
36-47	14	12.4
48-59	8	7.1
Child's gender		
Female	68	60.2
Male	45	39.8
Child's birth weight		
Low	34	30.1
Normal	66	58.4
Macrosomia	13	11.5
Infectious disease		
No	35	31.0
Yes	78	69.0
Feeding adequacy		
Adequate	89	78.8
Inadequate	24	21.2
Vitamin A supplement		
Not uptodate	22	19.5
Uptodate	91	80.5
Care taker		
Mother	102	90.3
Not the mother	11	90.7
Care taker's education level		
Non	23	20.4
Primary	45	39.8
Secondary	22	19.5
Tertiary	23	20.4
Care taker's employment status		
Peasant	34	30.1
Employed	32	28.3
Self employed	45	39.8

Table 1 above shows the demographic characteristics of the respondents. The age range of childrenin the study ranged from 6 to 59 months with mean age of 22.3 months ±14.2 standard deviation.Majority of the children were females 68 (60.2%) and had an up-to-date vitamin A supplement (80.5%, n=91). A big number of children 89 (78.8%) were fed adequately and majority 78 (69.0%)had a history of an infectious disease. More than half of the children 66 (58.4%) had a normal birthweight. Majority of the care takers were mothers (90.3%, n=102) and few of the care takers (20.4%, n=23) had tertiary education. Figure 2 below shows that out of the total children in the study, 36 (31.9%) of the children had malnutrition while majority 77 (68.1%) did not have malnutrition.

Figure 2: Prevalence of malnutrition (N=113

The distribution of malnutrition is illustrated in figure 3 below. The 36 children from the total number of 113 who had malnutrition, 21 (58%) had wasting while the rest 15 (42%) were stunted.

Figure 3: Distribution of malnutrition

Distribution of malnutrition

Stunted 42%

Wasted 58%
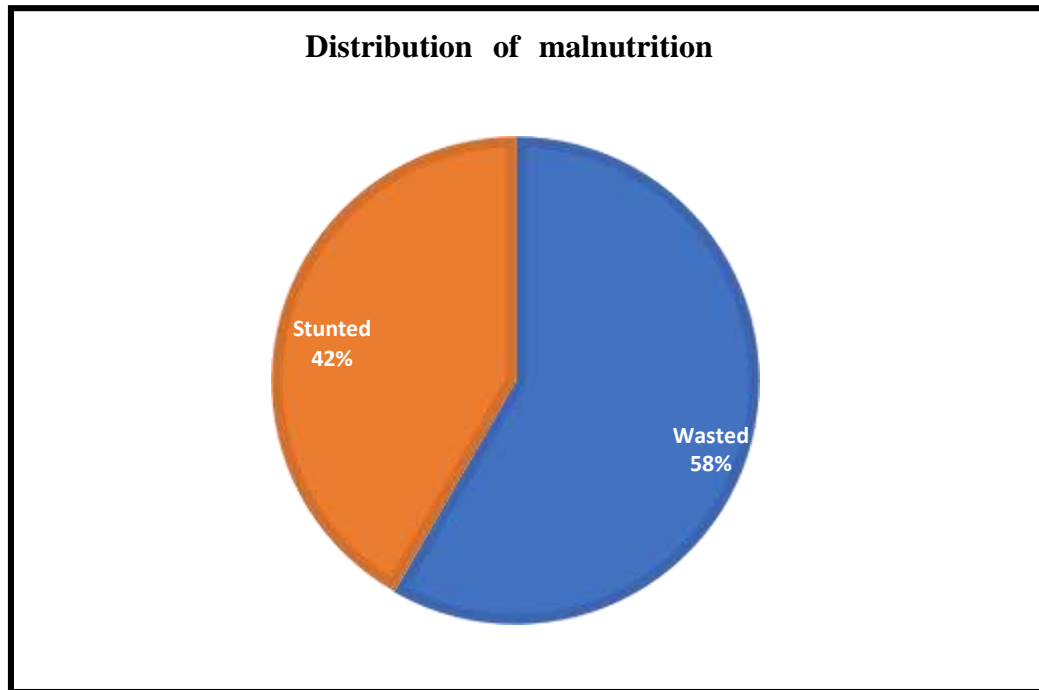
Results of chi square analysis are detailed in table 2 below. Factors which were significantly associated with malnutrition are; birth weight (X^2=33.64, P=<0.001), history of infectious disease(X^2=12.67, P=<0.001), and caretaker's occupation (X^2=25.45, P=<0.001).

Table 2: Association of respondents' characteristics and malnutrition

Variables	Malnourished		Chi square (X^2)	P value
	No	Yes		
Child's age (months)			1.59	0.810
6-11	34 (44.2%)	15 (41.7%)		
12-23	19 (24.7%)	8 (22.2%)		
24-35	11 (14.3%)	4 (11.1%)		
36-47	9 (11.7%)	5 (13.9%)		
48-59	4 (5.2%)	4 (11.1)		
Child's gender			2.28	0.131
Female	50 (64.9%)	18 (50.0%)		
Male	27 (35.1%)	18 (50.0%)		
Birth weight			33.64	<0.001
Low	10 (13.0%)	24 (66.7%)		
Normal	56 (72.7%)	10 (27.8%)		
Macrosomia	11 (14.3%)	2 (5.6%)		
Vitamin A supplement			0.002	0.996
Not uptodate	15 (19.5%)	7 (19.4%)		
Uptodate	62 (80.5%)	29 (80.6%)		
Infectious disease			12.67	<0.001
No	32 (41.6%)	3 (8.3%)		
Yes	45 (58.4%)	33 (91.7%)		
Feeding adequacy			1.76	1.000
Adequate	54 (70.1%)	15 (41.7%)		
Inadequate	23 (29.9%)	21 (58.3%)		
Caretaker's education level			2.085	0.682
Non	9 (11.7%)	14 (38.9%)		
Primary	36 (46.8%)	9 (25.0%)		
Secondary	11 (14.3%)	11 (30.6%)		
Tertiary	21 (27.3%)	2 (5.6%)		
Caretaker's occupation			25.45	<0.001
Peasant	13 (16.9%)	23 (63.9%)		
Employed	28 (36.4%)	4 (11.1%)		
Self employed	36 (46.8%)	9 (25.0%)		

DISCUSSION

This study discovered that the prevalence of malnutrition among children 6-59 months attending the MRRH was 31.9%, accounting for 36 out of 113 people sample size. This is slightly comparedto the national prevalence of 28.9% that was reported by the Uganda demographic and health survey (UDHS) report of 2016 [14]. The similarity in findings between these two studiesmay have been due to similarities in demographics of the respondents. However, compared to similar studies in other areas, the prevalence of malnutrition reported in this study is much lower.In the Western region of Uganda, particularly Tooro sub-region, a malnutrition prevalence was recorded at 41%. Recent researches by Shinsugi et al. [16], in Western Ethiopia and Shinsugi et al [16]., inSoutheastern Kenya revealed prevalence of 74.1% and 62% respectively. Similar high prevalenceof 52% malnutrition was recorded in South Asia [7]. Although these studies covered bigger populations, they still reflect a higher incidence of malnutrition compared to this study carried out in Mubende. While the prevalence in this study appeared to be low compared to other studies, at the same time it's much higher in comparison toother parts of Uganda. In the Western region Uganda, particularly Tooro sub-region malnutritionis 41%, West Nile sub-region has 10% and Teso sub-region has 14% [1]. The discrepancy between findings of this study and aforementioned studies may be due to differences in study setting and study methods where by both studies in Kenya and Ethiopia werecohort studies unlike the current study. This study revealed low birth weight, history of infectious diseases and caretaker/parents socio- economic status significantly influence Malnutrition. These findings were also reported by previous studies [16- 21]. In this study,birth weight was statistically associated with malnutrition. Children who had a low birth weight were more at risk of being malnourished (66.7%) than those with normal weight (27.8%) and macrosomia (5.6%). The observed association between birth weight and malnutrition in children is consistent with findings of several other studies [1, 22]. Thisimplies that there is an early exposure to nutritional stress and therefore the need for nutritional intervention right from the time of child conception. The main cause of low birth weight especially in developing countries is intranet-uterine growth retardation [23]. It is presumedthat babies who suffer from intra-uterine growth retardation will be born malnourished. In this study, 91.7% of children who had a history of having an infectious disease preceding two-weeks of the study were malnourished. Malnutrition can impair the immune system hence leadingto increased susceptibility to infectious diseases [24]. On the other hand, infectiousdiseases have direct impact on malnutrition. For instance, hookworm infections lead to loss of blood and nutrients as a result of the blood sucking activities of the worms [25].Moreover, illnesses can also lead to malnutrition by suppressing appetite of an individual for foodhence malnutrition [25].

CONCLUSION

Malnutrition still remain a herculean challenge in Uganda and the rest of Africa. While there are some reduction of global prevalence of malnutrition from 1999 to 2015, however, there is a disparity as African countries like Uganda still have increased prevalence of this condition. The major factors influencing Malnutrition among children attending the MRRH are low birth weight of, history of infectious diseases, and low socioeconomic status of the parents/caretakers. And there was a significant prevalence of malnutrition of 31.9%.

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