

Prevalence and Sociodemographic Determinants of Malnutrition among Under-Five Children in Rural Communities in Imo State, Nigeria

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Abstract Background: Malnutrition is a global issue with patterns and prevalence that vary significantly not only among different nations of the world but also in different region of a country. **Methodology:** This was a cross-sectional descriptive study carried out among under-five children in households in rural communities in Imo State. The multi-stage sampling technique was used for the selection of subjects. Data was collected by direct measurement of anthropometric parameters as well as the use of a semi-structured questionnaire to obtain caregivers' information. **Result:** This mean age of the children was 21.0 ± 17.9 months. The mean weight, height, MUAC, and Head Circumference of the children were 10.6 ± 4.4 kg, 82.7 ± 13.7 cm, 20.2 ± 3.6 cm and 51.5 ± 0.8 cm respectively. The prevalence of overweight/obesity, underweight, wasting and stunting were, 9.8%, 28.6%, 23.6% and 28.1% respectively. **Conclusion:** Based on our findings, there is high prevalence of malnutrition among under-five children in the studied communities, thus there is need to institute appropriate control measures by the relevant authorities to reverse this problem owing to the fact that most of the causes of malnutrition are preventable.

Keywords: prevalence, factors, malnutrition, under-five, communities, Imo state

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1. Introduction

Despite awareness about the dire impact of malnutrition on health and the availability of health and nutrition interventions, malnutrition continues to be one of the leading causes of morbidity and mortality worldwide, particularly in developing countries. Globally it has been estimated that stunting, severe wasting and intra-uterine growth restriction together accounted for 2.2 million deaths of children aged under five [1]. In developing countries the prevalence of malnutrition is high with 1 out of 3 pre-school children affected [2]. Malnutrition refers to the various forms of under-nutrition, which are stunting, wasting and underweight.

Underlying causes of malnutrition as described in the United Nations International Children's Emergency Fund (UNICEF) framework on child malnutrition include environmental, economic and socio-political factors, with poverty playing a major role [3].

Consequences of malnutrition include shorter adult height, less schooling and reduced economic productivity, and for women, offspring of lower birth weight [1]. Furthermore, the risks of developing overweight, obesity,

diabetes and hypertension are increased among adults who suffered from under-nutrition during early childhood [4]. Nigeria is one of the leading economies in Africa and subscribes to initiatives such as the United Nations Millennium Development Goals (MDGs), one of the aims of which is to reduce the number of people suffering from hunger by 50% by 2015 [5]. However, despite this, Nigeria faces child malnutrition problems. According to 2013 Nigeria Demographic and Health Survey (NDHS), 37% of children under the age of five are considered to be short for their age or stunted, while 21% are severely stunted (below -3 SD). Eighteen percent (18%) of under-five Nigerians children are considered wasted or too thin for their height and 9% are severely wasted. Twenty-nine percent (29%) of Nigerian children are underweight (low weight for age), with 12% being severely underweight [6].

Various studies on child malnutrition on the African continent have shown that demographic, socio-economic and clinical profiles of malnourished children differ from one region to the next. Characteristics that were found to contribute to child malnutrition in the different regions ranged from the age of the child or the caregiver, family size and income and the caregivers education to underlying clinical conditions [7,8,9,10,11].

The aim of this study was therefore to determine the prevalence and factors associated with malnutrition among under-five year olds in rural communities Imo State, Nigeria.

2. Methodology

Study Area and Population: Imo state is one of the 36 states of Nigeria, created in 1976 with a population of about 4.2 million. It has 3 senatorial zones and 27 local government areas (LGAs) of which 22 are rural while 5 are urban as designated by the National Population Commission [12]. Nwangele is one of the rural Local Government Areas (LGAs) of Imo State with headquarters at Amaigbo. It has an area of 63 square kilometer and a population of 123,472 people according to the 2006 National Population Census (NPC) [12]. It was created on 4th December 1996 and presently has ten towns and eleven political wards. The main economic activities of the people are subsistence farming and petty trading. The LGA has 28 nursery and primary schools of which 6 are privately owned. There are 6 government owned secondary school and 4 private ones. The study area also has two institutions of higher learning namely; Imo State College of Nursing and Health Sciences, Amaigbo and School of Nursing, Saint Mary's Joint Hospital, Amaigbo, owned by the state government and Catholic Church respectively. There are a total of 14 primary and secondary health facilities in the local government [12].

Study Design and Study Population: The study was a descriptive cross-sectional and the study population comprised children aged 0-59 months who reside in households from the selected rural communities.

Sample Size Estimation: Using the Cochran formula for sample size estimation for cross-sectional studies in populations above 10,000 people and proportion of under-five-year olds in the rural areas who suffer from chronic malnutrition (stunted) in Nigeria according to the 2013 NDHS (43.0%) [6], the sample size that was used for this study was 406 children taking into consideration 10% attrition.

$$\text{Sample size formula; } n = \frac{Z^2 pq}{d^2}$$

Where; n= Desired sample size, Z= 95% confidence level = 1.96, p= Proportion of the target population estimated to have chronic malnutrition= 0.43, q= 1-p = 0.57, d= 5% sampling error = 0.05

Sampling Technique: The sampling technique used was the multi-stage sampling technique. Stage 1: Involved the selection of Nwangele LGA from the list of rural LGAs in Imo state, using simple random sampling by balloting.

Stage 11: Involved the selection of wards that were studied from Nwangele LGA, of which 8 out of 11 wards in the LGA was selected using simple random sampling technique by balloting.

Stage 111: Involved the selection of enumeration areas to be studied. In each of the selected wards, two enumeration areas were selected using simple random sampling technique by balloting.

Stage 1V: Involved the selection of children and households to be studied. Only one child per household

was selected and the mother or caregiver interviewed. In households with more than one eligible participant, simple random sampling by balloting was used to select the participant to be studied. Prominent places in the enumeration areas were located and moving in a clockwise direction, any household with eligible respondents were enrolled and interviewed until the required number for each enumeration was obtained. Twenty six children were selected in each enumeration area.

Selection Criteria: Only under-five children whose caregiver has been staying in the study area for at least 6 months prior to the study were enrolled and studied.

Data Collection Method and Analysis: Data was collected by direct measurement of anthropometric parameters; weight, height/length, head circumference and mid upper arm circumference (MUAC) and percentages of these parameters among the participants were compared with the expected calculated values for the child's age using the appropriate formulas [13,14]. Weight was recorded in kilograms to the nearest 0.1 kg using a standardized weighing scale. The height/length of the children was measured using a measuring board graduated to the nearest 0.1 cm. The head circumference and MUAC were measured using a tape rule.

The following classification was used for this survey [13,14].

Mid Upper Arm Circumference (MUAC)
 < 12.5 cm – Malnutrition
 12.5 – 13.5 cm – At risk of malnutrition
 ≥ 14cm – Well Nourished

Modified Wellcome Working Party Classification [14].

S/N	Type	Observed Weight As % of Ideal Weight for Age
1	Obesity	> 120
2	Overweight	110 – 120
3	Normal Range	90 – 110
4	Underweight	< 90

Height for Age [13]

Anthropometric Parameters Normal
 Mild-Moderate Severe

Height for age (Stunting) > 90%
 80 – 90% < 80%

Weight for Height (Wasting) > 80%
 70 – 79% < 70%

Based on above parameters, the children were classified as well nourished (normal), underweight, overweight, stunted or wasted. Also socio-demographic data were obtained in an interview using a semi-structured questionnaire developed by the researchers.

The data obtained were cleaned, validated manually and analysed using computer software (Epi Info 7.1). Frequency tables with percentages were generated. Bivariate analysis using the Chi-square was done where appropriate to test for significant association between variables. Results were considered significant when p value was < 0.05.

Ethical Approval: Ethical approval for this study was obtained from Imo State University Teaching Hospital Ethics Committee (IMSUTHEC). Approval was also given by the appropriate authorities in the Local Government Area and communities studied. Verbal informed consent was obtained from each caregiver before we commenced the study.

3. Results

Table 1. Socio-demographic characteristics of the children and caregivers

Socio-demographic characteristics	Frequency (n = 406)	Percentage
Age in months		
1 – 12	214	52.7
13 – 24	45	11.1
25 – 36	47	11.6
37 – 48	48	11.8
49 – 60	52	12.8
Total	406	100
Mean 21.0 ± 17.9 months		
Sex of Pupils		
Male	198	48.8
Female	208	51.2
Total	406	100
Class		
Pre-nursery	94	23.2
Nursery	192	47.3
None	120	29.5
Total	406	100
Position among siblings		
First child	80	19.2
Second child	50	12.3
Third child	100	24.6
Last	176	43.4
Total	406	100
Mothers Education		
Primary	250	61.6
Secondary	106	26.1
Tertiary	30	7.4
None	20	4.9
Total	406	100
Care giver		
Mother only	26	6.4
Father only	15	3.6
Relative	5	1.2
Both parents	360	88.7
Total	406	100
Mothers Occupation		
Civil servant	120	29.6
Farmer	116	28.6
Trader	160	39.4
House wife	10	2.4
Total	406	100
Fathers Occupation		
Civil servant	150	36.9
Farmer	40	9.9
Trader	178	43.8
Artisan	38	9.4
Total	406	100
Person interviewed		
Father	140	34.5
Mother	200	49.3
Relatives	66	16.2
Total	406	100

The mean age of the children was 21.0 ± 17.9 months with more than half of the children (52.7%) being within the ages of 0 – 12 months. Female children (51.2%) were slightly more than the male children (48.8%). Majority of these children (70.5%) had already been enrolled into school. A sizeable proportion of the participants (43.4%) were the last child in the household as at the time of the survey. Most of the mothers (61.6%) had only primary education while majority of the care giving (88.7%) was done by both parents. Majority of the mothers were either petty traders or farmers (68.0%) while the dominant occupations of the fathers were trading (43.8%) and civil service (36.9%). In this research, most of the persons interviewed were their mothers, 49.3% and fathers, 34.5%. Only 3.9% of the children had their mother deceased as at the time of this survey. [Table 1](#)

The mean weight, height, mid upper arm circumference (MUAC) and head circumference were; 10.6kg ± 4.4, 88.7cm ± 13.7, 20.2cm ± 3.5 and 51.5 ± 0.6 cm respectively. Underweight (28.6%) was the most common nutritional abnormality observed in this study. This was followed by stunting (28.1%), and wasting (23.6%). Overweight children were 9.6% only. [Table 2](#).

Table 2. Nutritional Status of Subjects in Study Population

Nutritional Status	Frequency (n = 406)	Percentage
Weight for age		
Underweight	116	28.6
Overweight/Obesity	40	9.8
Normal	250	61.1
Total	406	100
Height for age		
Stunted	114	28.1
Normal	292	71.9
Total	406	100
Weight for height		
Wasting	96	23.6
Normal	310	76.4
Total	406	100
MUAC		
Malnutrition	27	6.7
Risk of malnutrition	52	12.8
Normal	327	80.5
Total	406	100

[Table 3](#) revealed that prevalence of low weight for age (underweight) is fairly uniformly distributed among the age groups ranging from 21.3% in 25 - 36 months old, to 33.3% in 13 - 24 months age group. Variation of age with low weight for age is not statistically significant ($\chi^2 = 4.24$, $df = 8$, $p = 0.835$). Greater proportions of the males were underweight (34.3%) when compared to their female counterpart (23.1%). This difference was statistically significant ($\chi^2 = 23.2$, $df = 2$, $p = 0.000$). The prevalence of underweight was highest (65%) among children of mothers or caregivers with no formal education while those with tertiary education have the highest prevalence of children who were overweight (30%), ($\chi^2 = 49.9$, $df = 6$, $p = 0.000$). Underweight was found more in children that were yet to be enrolled in school, 29.2% and in those in pre-nursery classes, 31.9%, ($\chi^2 = 25.0$, $df = 4$, $p = 0.000$). Also maternal occupation ($\chi^2 = 39.8$, $df = 6$, $p = 0.000$) and paternal occupation ($\chi^2 = 25.3$, $df = 6$, $p = 0.000$) showed

statistically significant association with participants' weight for age while there was no significant association between the position among siblings and weight for age ($\chi^2 = 10.0$, $df = 6$, $p = 0.124$).

Table 3. Socio-demographic Characteristics of Children and Nutritional Status (Weight for Age)

Variable	Normal n (%)	Underweight n (%)	Overweight n (%)	Total n (%)	Statistics/p-value
Age group (months)					
1 – 12	133(62.2)	60(28.0)	21(9.8)	214 (100)	$\chi^2 = 4.24$
13 – 24	28(62.2)	15(33.3)	2(4.4)	45 (100)	$df = 2$
25 – 36	32(68.1)	10(21.3)	5(10.6)	47 (100)	$p = 0.835$
37 – 48	28(58.3)	15(31.3)	5(10.4)	48 (100)	
49 – 59	29(55.8)	16(30.8)	7(13.5)	52 (100)	
Total	250(61.6)	116(28.6)	40(9.8%)	406 (100)	
Sex of Respondents					
Male	100(50.5)	68(34.3)	30(15.2)	198 (100)	$\chi^2 = 23.2$
Female	150(72.1)	48(23.1)	10(4.8)	208 (100)	$df = 2$
Total	250(61.6)	116(28.6)	40(9.8)	406(100)	$p = 0.000^*$
Educational status of Mother					
None	5(25.0)	13(65.0)	2(10.0)	20 (100)	$\chi^2 = 49.9$
Primary	143(57.2)	87(34.8)	20(8.0)	250 (100)	$df = 6$
Secondary	83(78.3)	14(13.2)	9(8.5)	106 (100)	$p = 0.000^*$
Tertiary	19(63.3)	2(6.7%)	9(30.0)	30 (100)	
Total	250(61.6)	116(28.6)	40(9.8)	406 (100)	
Educational status of the child					
Nursery	136(70.8)	50(26.1)	6(3.1)	192 (100)	$\chi^2 = 25.0$
Pre-Nursery	46(48.9)	30(32.0)	18(19.1)	94 (100)	$df = 4$
None	68(56.7)	36(30.0)	16(13.3)	120 (100)	$p = 0.000^*$
Total	250(61.6)	116(28.6)	40(9.8)	406 (100)	
Position of child in household					
1 st Child	53(66.3)	22(27.5)	5(6.3)	80 (100)	$\chi^2 = 10.0$
2 nd Child	32(64.0)	17(34.0)	1(2.0)	50 (100)	$df = 6$
3 rd Child	53(53.0)	33(33.0)	14(14.0)	100 (100)	$p = 0.124$
Last Child	112(63.6)	44(25.0)	20(11.4)	176 (100)	
Total	250(61.6)	116(28.6)	40(9.8)	406 (100)	
Occupation of Mother					
Civil Servant	82(68.3)	20(16.7)	18(15.0)	120 (100)	$\chi^2 = 39.8$
Farmer	64(55.2)	32(27.6)	20(17.2)	116 (100)	$df = 6$
Trader	100(62.5)	60(37.5)	0(0.0)	160 (100)	$p = 0.000^*$
House wife	4(40.0)	4(40.0)	2(20.0)	10 (100)	
Total	250(61.6)	116(28.6)	40(9.8)	406 (100)	
Occupation of Father					
Civil Servant	106(70.7)	27(18.0)	17(11.3)	150 (100)	$\chi^2 = 25.3$
Farmer	29(72.5)	5(12.5)	6(15.0)	40 (100)	$df = 6$
Trader	96(53.9)	68(38.2)	14(7.9)	178 (100)	$p = 0.000^*$
Others	19(50.0)	16(42.1)	3(7.9)	38 (100)	
Total	250(61.6)	116(28.6)	40(9.8)	406 (100)	

*=significant.

Table 4 showed that prevalence of stunting was predominant (44.4%) among the age group 13 – 24 months. This variation in stunting with age was statistically significant ($\chi^2 = 17.0$, $df = 4$, $p = 0.002$). More male children (35.4%) were significantly more stunted than their female counterparts (21.2%), ($\chi^2 = 10.1$, $df = 1$, $p = 0.001$). Prevalence of stunting was highest among under-five year olds whose mothers and caregivers had no

formal education (65%), ($\chi^2 = 26.6$, $df = 3$, $p = 0.000$), among children yet to start school (37.5%), ($\chi^2 = 8.95$, $df = 2$, $p = 0.011$), and those that were last among the siblings (30.7%), ($\chi^2 = 2.76$, $df = 3$, $p = 0.429$). Maternal occupation was observed to affect height for age ($\chi^2 = 23.6$, $df = 3$, $p = 0.000$), however, variation of stunting with father's occupation was not statistically significant, ($\chi^2 = 5.51$, $df = 3$, $p = 0.138$).

Table 4. Socio-demographic Characteristics of Children and Nutritional Status (Height for Age)

Variable	Normal (%)	Stunted (%)	Total (%)	Statistics/p-value
Age of child in months				
1 – 12	170(79.4)	44(20.6)	214(100)	$\chi^2 = 17.0$
13 – 24	25(55.6)	20(44.4)	45(100)	df = 4
25 – 36	35(74.5)	12(25.5)	47(100)	p = 0.002*
37 – 48	30(62.5)	18(37.5)	48(100)	
49 – 59	32(61.5)	20(38.5)	52(100)	
Total	292(71.9)	114(28.1)	406(100)	
Sex of child				
Male	128(64.6)	70(35.4)	198(100)	$\chi^2 = 10.1$
Female	164(78.8)	44(21.2)	208(100)	df = 1
Total	292(71.9)	114(28.1)	406(100)	p = 0.000*(
Educational status of mother				
None	7(35.0)	13(65.0)	20(100.0)	$\chi^2 = 26.6$
Primary	172(68.8)	78(31.2)	250(100.0)	df = 3
Secondary	84(79.2)	22(20.8)	106(100.0)	p = 0.000*
Tertiary	29(96.7)	1(3.3)	30(100.0)	
Total	292(71.9)	114(28.1)	406(100.0)	
Educational status of child				
Nursery	150(78.1)	42(21.9)	192(100.0)	$\chi^2 = 8.95$
Pre-Nursery	67(71.3)	27(28.7)	94(100.0)	df = 2
None	75(62.5)	45(37.5)	120(100.0)	p = 0.011*
Total	292(71.9)	114(28.1)	406(100.0)	
Position of child among siblings				
1 st child	60(75.0)	20(25.0)	80(100.0)	$\chi^2 = 2.76$
2 nd child	40(80.0)	10(20.0)	50(100.0)	df = 3
3 rd child	70(70.0)	30(30.0)	100(100.0)	p = 0.429
Last child	122(69.3)	54(30.7)	176(100.0)	
Total	292(71.4)	114(28.6)	406(100.0)	
Mother's Occupation				
Civil servant	95(79.2)	25(20.8)	120(100.0)	$\chi^2 = 23.6$
Farmer	96(82.8)	20(17.2)	116(100.0)	df = 3
Trader	94(58.8)	66(41.2)	160(100.0)	p = 0.000*
House wife	7(70.0)	3(30.0)	10(100.0)	
Total	292(71.4)	104(28.6)	406(100.0)	
Father's Occupation				
Civil servant	111(74.0)	39(26.0)	150(100.0)	$\chi^2 = 5.51$
Farmer	34(85.0)	6(15.0)	40(100.0)	df = 3
Trader	120(67.4)	58(32.6)	178(100.0)	p = 0.138
Artisan	27(71.1)	11(28.9)	38(100.0)	
Total	292(71.4)	114(28.6)	406(100.0)	

*=significant.

Also, the prevalence of wasting was higher (40.0%) among the age group 13 – 24 months. This difference was statistically significant, ($\chi^2 = 18.3$, df = 4, p = 0.001). Wasting was slightly higher among the male (26.3%) than the female (21.2%) gender, though this difference was not statistically significant, ($\chi^2 = 1.47$, df = 1, p = 0.226). The prevalence of wasting was highest (35.0%) among children whose mothers or caregivers had no formal education. The difference was statistically significant ($\chi^2 =$

13.6, df = 2, p = 0.003). In this study, pre-nursery children had the highest incidence of wasting (29.8%) when compared to other educational levels but this was not statistically significant ($\chi^2 = 4.55$, df = 2, p = 0.103). The position of the child in the household statistically affected the pattern of wasting ($\chi^2 = 10.6$, df = 3, p = 0.014), just like maternal occupation ($\chi^2 = 13.3$, df = 2, p = 0.003), however, occupation of the father did not statistically influence wasting ($\chi^2 = 5.82$, df = 3, p = 0.121). [Table 5.](#)

Table 5. Socio-demographic Characteristics of Children and Nutritional Status (Weight for Height)

Variable	Normal (%)	Wasted (%)	Total (%)	Statistics/p-value
Age of child in months				
1 – 12	180(84.1)	34(15.9)	214(100.0)	$\chi^2 = 18.3$
13 – 24	27(60.0)	18(40.0)	45(100.0)	df = 4
25 – 36	33(70.2)	14(29.8)	47(100.0)	p = 0.001*
37 – 48	36(75.0)	12(25.0)	48(100.0)	
49 – 59	34(65.4)	18(34.6)	52(100.0)	
Total	310(76.4)	96(23.6)	406(100.0)	
Sex of child				
Male	146(73.7)	52(26.3)	198(100.0)	$\chi^2 = 1.47$
Female	164(78.8)	44(21.2)	208(100.0)	df = 1
Total	310(76.4)	96(23.6)	406(100.0)	p = 0.226
Educational status of mother				
None	13(65)	7(35.0)	20(100.0)	$\chi^2 = 13.6$
Primary	179(71.6)	71(28.4)	250(100.0)	df = 2
Secondary	90(84.9)	16(15.1)	106(100.0)	p = 0.003*
Tertiary	28(93.3)	2(6.7)	30(100.0)	
Total	310(76.4)	96(23.6)	406(100.0)	
Educational status of child				
Nursery	145(75.5)	47(24.5)	192(100.0)	$\chi^2 = 4.55$
Pre-Nursery	66(70.2)	28(29.8)	94(100.0)	df = 2
None	99(82.5)	21(17.5)	120(100.0)	p = 0.103
Total	310(76.4)	96(23.6)	406(100.0)	
Position of child among siblings				
1 st child	69(86.3)	11(31.7)	80(100.0)	$\chi^2 = 10.6$
2 nd child	43(86.0)	7(14.0)	50(100.0)	df = 3
3 rd child	74(74.0)	26(26.0)	100(100.0)	p = 0.014*
Last child	124(70.5)	52(29.5)	176(100.0)	
Total	310(76.4)	96(23.6)	406(100.0)	
Mother's Occupation				
Civil servant	82(68.3)	38(31.7)	120(100.0)	$\chi^2 = 13.3$
Farmer	101(87.1)	15(12.9)	116(100.0)	df = 2
Trader	118(73.8)	42(26.2)	160(100.0)	p = 0.004*
House wife	9(90.0)	1(10.0)	10(100.0)	
Total	310(76.4)	96(23.6)	406(100.0)	
Father's Occupation				
Civil servant	124(82.7)	26(17.3)	150(100.0)	$\chi^2 = 5.82$
Farmer	20(75.0)	10(25.0)	40(100.0)	df = 3
Trader	127(71.3)	51(28.7)	178(100.0)	p = 0.121
Artisan	29(76.3)	9(23.7)	38(100.0)	
Total	310(76.4)	96(23.6)	406(100.0)	

*=significant.

4. Discussion

The proportion of underweight children in this study is 28.6%, this compares favourably with the national figure of 29.0% according to the 2013 Nigeria Demographic and Health Survey (NDHS). [6] The proportion of stunted children in our study was 28.1%, this is lower than the national figure of 37.0% for stunted under-fives. Our study also revealed a high proportion, (23.6%) of under-

five-year olds considered too thin for their height (wasted). This figure is slightly more than the national average of 18.0%. [6] According to a joint UNICEF, WHO and The World Bank malnutrition data base for 2012, 56% of all stunted under-five-year olds lived in Asia and 36% in Africa; 67% of Asian under-five-year olds were underweight while it is 29% in Africa. Asia also has a higher proportion of wasted children (69%) when compared to Africa (28%), [15] despite having better economy than Africa; this could be explained by their large population size when compared to other continents.

Majority of the underweight, stunted and wasted children were in the age group 13 – 24 months. This is the period when most children are weaned off breast milk and supplementary feeds introduced. Other studies [11,16] have confirmed that the single most important antecedent factor in the development of malnutrition in children is the introduction of complementary feeds. Studies by Olwedo et al [17] in Uganda, Emina et al [18] in the Democratic Republic of Congo and Irena et al [19] in Zambia have suggested that under-nutrition is more prevalent among boys than among girls. Likewise, our study found higher proportion of under-weight, stunted and wasted among males when compared to females. This is difficult to explain given that our society place higher premium on male children compared to the female ones. However, our study revealed no significant association between gender and wasting ($p = 0.226$). Other African studies in Botswana and Eastern Sudan [11,20] concluded that there was no difference in proportions of under nourished male and female children.

Our study revealed that having more children was a significant predictor for childhood malnutrition. A similar finding was reported in studies done in Malaysia [21], Pakistan [22] and Vietnam [23]. The increased number of children in families placed a heavy burden on the scarce household resources, particularly on financial and food; it also reduced the time and quality of care received by the children [24].

Studies in other parts of the world have identified a number of risk factors and some of these have been consistent with findings of our study. An example is low maternal education [25,26]; one year of maternal education has been associated with a 9% decrease in under-five mortality and children of better educated mothers, other things being equal, tend to be healthier [27]. One study concurs with the positive correlation between low maternal education and childhood malnutrition. A positive correlation between high maternal education and child's nutritional status could be explained on the basis of improved socioeconomic status, health facility utilization and enhanced mothers' empowerment in decision making [28,29]. However, other researchers have not demonstrated this and they found children to be severely malnourished in spite of mothers' high levels of education [30].

5. Conclusion

The prevalence of malnutrition was observed to be high in our study and most of the associated factors found were preventable. This is of grave public health problem as it affects both physical and mental development of the children and thus there is need to institute simple preventive measures at the community level like health promotion, education and school feeding programmes as these will go a long way to curb this menace among other measures.

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